U.S. Department
of Transportation
**Federal Aviation
Administration**

Office of the Associate
Administrator for Airports

800 Independence Ave., SW.
Washington, DC 20591

November 7, 2014

Ms. Gina Marie Lindsey
Executive Director
Los Angeles World Airports (LAWA)
One World Way
P.O. Box 92216
Los Angeles, CA 90009

**Subject: FAA determination pursuant to 14 Code of Federal Regulations Part 161
LAWA Application dated January 13, 2013 (supplemented May 14, 2014)**

Dear Ms. Lindsey:

This letter transmits the Federal Aviation Administration's (FAA) decision on LAWA's application (referenced above) to restrict and penalize certain easterly Stage 3 aircraft departures from Los Angeles International Airport between 12 midnight and 6:30 AM. Scott Tatro's letter of May12, 2014 confirmed that LAWA does not seek FAA review of any alternative measures.

The FAA found LAWA's application to be administratively complete on June 10, 2014. The FAA evaluated the analysis and evidence LAWA filed in support of the six statutory conditions that must be satisfied before FAA can approve the restriction. The FAA determined that the analysis and evidence met three of the six conditions. However, the regulation requires that the proposed restriction meet all of the statutory conditions. On this basis, FAA has disapproved the application. The enclosed decision outlines the FAA's analysis and conclusions regarding the proposed restriction.

This is a final decision of the Administrator for purposes of judicial review. The FAA will provide public notice of its decision through the *Federal Register*.

Sincerely,

Benito De Leon
Deputy Associate Administrator
for Airports

Enclosure

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Introduction

This matter is before the Federal Aviation Administration (FAA) Deputy Associate Administrator for Airports. The City of Los Angeles, acting through Los Angeles World Airports (LAWA)[1] proposes to limit aircraft departures to the east, with certain exemptions, from 12:00 midnight to 6:30 a.m. when the airport is in Over-Ocean or Westerly Operations at Los Angeles International Airport (LAX). During these conditions, all aircraft are permitted to depart to the west. However, for some aircraft, departing to the west is not possible unless they offload weight. According to LAWA, air carriers that would normally depart to the east would continue to operate by reducing their payload so they can safely depart west, or they would wait until more favorable wind conditions exist. Because the proposal constitutes a noise or access restriction affecting the operations of Stage 3 aircraft at LAX, the FAA must determine whether to approve the proposed mandatory departure restriction under the Airport Noise and Capacity Act of 1990 (ANCA), 49 U.S.C. §47521 et seq., as implemented by 14 C.F.R. part 161.

Statutory and Regulatory Framework

In 1990, in response to a proliferation of "uncoordinated and inconsistent" noise and access restrictions at airports, Congress enacted ANCA. Congress made the following findings:

1) Aviation noise management is crucial to the continued increase in airport capacity;
2) Community noise concerns have led to uncoordinated and inconsistent restrictions on aviation that could impede the national air transportation system;
3) A noise policy must be carried out at the national level;
4) Local interests in aviation noise management shall be considered in determining the national interest;
5) Community concerns can be alleviated through the use of new technology aircraft and the use of revenues, including those available from passenger facility fees for noise management;
6) Revenues controlled by the US Government can help resolve noise problems;
7) Revenues derived from a passenger facility fee may be applied to noise management and increased airport capacity; and
8) A precondition to the establishment and collection of a passenger facility fee is the prescribing by the Secretary of Transportation of a regulation establishing procedures for reviewing airport noise and access restrictions on operations of stage 2 and stage 3 aircraft.[2]

ANCA applies to airport noise and access restrictions[3] on the operation of Stage 2 and Stage 3 aircraft.[4] Airport proprietors must be in compliance with ANCA to be eligible to obtain grants under the Airport and Airway Improvement Act[5] and to impose passenger facility charges authorized by 49 U.S.C. §40117.[6]

No restriction on Stage 3 aircraft operations can become effective unless it has been agreed upon by

[1] LAWA is the City department that operates LAX under the governance of the Board of Airport Commissioners.
[2] 49 U.S.C. § 47521(1) — (8).
[3] Restrictions in effect on October 1, 1990 were "grandfathered" and are not subject to the requirements of ANCA. 49 U.S.C. § 47524(c). Amendments to "grandfathered" restrictions that further reduce or limit aircraft operations or affect aircraft safety are subject to Part 161. 49 U.S.C. § 47524(d)(4).
[4] Aircraft must comply with certain noise levels, or "stages." A "Stage 2 airplane" means an airplane that has been shown under 14 CFR part 36 to comply with the Stage 2 noise levels prescribed in section C36.5 of Appendix C and that does not comply with the requirements for a Stage 3 airplane. A "Stage 3 airplane" means an airplane that has been shown under 14 CFR part 36 to comply with Stage 3 noise levels prescribed in section C36.5 of Appendix C.
[5] 49 U.S.C. §40101 et seq.
[6] 49 U.S.C. §§ 47524(e); 47526.

the airport proprietor and all operators and/or approved by the FAA.[7] Absent agreement, the FAA may approve a Stage 3 restriction only if the six statutory conditions are supported by substantial evidence.[8]

The six statutory conditions are:

(1) The restriction is reasonable, non-arbitrary, and non-discriminatory;
(2) the restriction does not create an undue burden on interstate or foreign commerce;
(3) the restriction is not inconsistent with maintaining the safe and efficient use of the navigable airspace;
(4) the restriction does not conflict with a law or regulation of the United States;
(5) an adequate opportunity has been provided for public comment on the restriction; and
(6) the restriction does not create an undue burden on the national aviation system. [9]

Congress directed the FAA to issue regulations to implement ANCA, prescribing some elements while leaving others to agency discretion.[10]The FAA published 14 C.F.R. part 161 to establish a consistent nationwide process for review of airport noise and access restrictions.[11] The Part 161 regulations outline the information FAA considers essential to provide the substantial evidence required to support the six conditions for approval of a restriction.[12] The Part 161 regulations also require the applicant to describe the noise level at an airport and surrounding areas, and the exposure of individuals to noise resulting from operations at an airport, in accordance with the specifications and methods prescribed under 14 C.F.R. part 150, including use of computer models to create noise contours.[13]

[7] 49 U.S.C. § 47524(c).
[8] 49 U.S.C. § 47524(c)(2).
[9] 49 U.S.C. § 47524(c)(2)(A)-(F).
[10] 49 U.S.C. § 47524(a).
[11] The FAA still encourages airport sponsors considering proposed restrictions to utilize the procedures in Part 150. See, 14 CFR §161.321.
[12] 14 C.F.R. § 161.305(e)(2).
[13] The Aviation Safety and Noise Abatement Act (ASNA),as implemented by 14 C.F.R. Part 150, required the FAA to establish a single system for measuring noise that is to be uniformly applied in measuring noise at airports and the areas surrounding such airports. 49 U.S.C. § 47502(1)(A)(B). ASNA also required the FAA to establish a single system for determining the exposure of individuals to noise which results from the operations of an airport and to identify land uses which are normally compatible with various exposures of individuals to noise. 49 U.S.C. § 47502(2), (3).

Background

LAX is bordered by the community of Westchester to the north, the cities of Inglewood and Hawthorne to the northeast and southeast, the City of El Segundo to the south and the Pacific Ocean to the west. The airport has two sets of east-west parallel runways.

Aircraft require a minimum amount of airspeed (i.e., a minimum velocity of air passing over the wings) in order to generate lift. As a result, they normally take off and land in the opposite direction of the wind. Due to the prevailing on-shore winds, the normal traffic pattern at LAX has arriving aircraft approach the airport from the east and departing aircraft take off to the west ("Westerly Operations").[14] This procedure routes departing aircraft (which normally generate more noise than arriving aircraft) over the ocean. When weather conditions require (e.g., during Santa Ana winds), operations are reversed, so that aircraft arrive from the west and depart to the east ("Easterly Operations").

LAWA has a long-established runway use program for LAX, adopted by Los Angeles Board of Airport Commissioners (BOAC) in 1972.[15] One element of this program, first implemented in 1974, is Over-Ocean Operations, which utilize a contra-flow operation that directs both arrivals and departures over the ocean to relieve nighttime noise for residents of communities east of the airport. The FAA authorized this informal runway use program under FAA Order 8400.9, with a waiver allowing Westerly and Over-Ocean Operations with a tailwind of no more than 10 knots.[16] Current LAX Aircraft Noise Abatement Operating Procedures and Restrictions include Over-Ocean Operations between midnight and 6:30 a.m.[17]

As LAWA acknowledges, under FederalFederal law FAA Air Traffic Control (ATC) personnel have discretion to utilize all four runways as they deem necessary for the purposes of safety and air traffic efficiency.[18] However, except for a brief period in the early 1980s,[19] FAA ATC has implemented this procedure to the maximum extent possible to minimize noise impacts on residential areas. According to LAWA, overall aircraft operator adherence to the LAX Preferential Runway Use Policy is very high; however, LAWA recognizes that there are operational and safety considerations that make full observance infeasible.[20]

The primary reason aircraft do not adhere to the Over-Ocean departure is because the pilot deems that a westerly tailwind may adversely affect the safety of the aircraft operation. A tailwind from east to west blows from behind an aircraft departing to the west, and does not provide as much lift as a headwind. This is of particular concern for large, heavily loaded aircraft bound for long-distance Asia-Pacific Rim airports.

During Over-Ocean and Westerly Operations, the pilot-in-command of an aircraft may request an easterly departure when the tailwind component is between 0 and 10 knots in order to maximize their headwind component and meet minimum takeoff length requirements for the weight of the aircraft. Historically, most of the operators requesting to depart to the east when tailwinds are 10 knots or less have been long-haul passenger and cargo carriers with heavily loaded aircraft heading to Pacific Rim

[14] Aircraft optimally take off and land into the wind ("headwind"); taking off or landing in the same direction as the wind ("tailwind") may require additional runway length.
[15] Los Angeles Board of Airport Commissioners, Resolution No. 7467, December 20, 1972.
[16] Waiver to FAA Order 8400.9 (Feb. 14, 1985), LAWA Application Appendix E, p. E-1.
[17] Los Angeles World Airports, LAX Rules and Regulations (September 2010) p. 5-3.
[18] *See* Los Angeles International Airport – Preferential Runway Use Policy, Report on LAWA's Implementation of the the Preferential Runway Use Policy (April 11, 2014), p. 7. *See also* LAX Rules and Regulations, p. 5-1. ("ATC shall employ the noise abatement preferential runway and taxiway use procedures specified herein, recognizing that under certain conditions it may be necessary to prescribe deviations because of aircraft emergencies, adverse weather, or field construction and maintenance work. Nothing in these 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.")
[19] 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. LAWA Part 161 Application p. 3.
[20] *See* Report on LAWA's Implementation of the Preferential Runway Use Policy (April 11, 2014), p. 1.

destinations. Upon receiving such a request from a pilot, FAA ATC will clear the departure as efficiently as possible, and direct the pilot to make a right turn of 180 degrees back towards the general flow of other westerly traffic.

Departures to the east when the airport is not in Easterly Operations are referred to as "non-conforming." If implemented, LAWA's proposed restriction would subject non-conforming departures to a fine any time the airport is in Westerly Operations or in Over-Ocean Operations between midnight and 6:30 a.m.

LAWA's Part 161 Application

On February 17, 2006, the City of Los Angeles signed a stipulated settlement agreement with the Cities of Inglewood, Culver City, and El Segundo, Los Angeles County and the Alliance for a Regional Solution to Airport Congestion resolving litigation challenging approval of the LAX Master Plan Program. In this agreement, LAWA stated that it had initiated a Part 161 study of the feasibility of implementing restrictions on departures between the hours of midnight and 6:30 a.m. over the communities to the east of LAX, and committed to seek FAA approval of various penalties that can be imposed on airlines whose flights violate nighttime over-ocean policies and procedures.[21]

LAWA submitted a formal Part 161 Application to the FAA, requesting approval of its proposed restriction.[22] Under Part 161 the review period starts on the date of receipt of the complete application which was May 22, 2014. The FAA's 180-day regulatory review period ends November 8, 2014.

Analysis

To determine whether the FAA may approve the proposed restriction at LAX, the FAA must evaluate each of the following six conditions to determine if LAWA has provided substantial evidence to support the condition. The FAA analyzed LAWA's application based on the information provided in the application and other sources of information as indicated. Each condition is set out below with a full review of the evidence, FAA's analysis and conclusion.

[21] Stipulated Settlement, Exhibit A, A.10 (Feb. 16, 2006).

[22] The FAA found LAWA's initial Application to be incomplete. LAWA submitted a supplemental analysis. The FAA found that the submission continued to be incomplete and after further correspondence, LAWA resubmitted the Part 161 Application.

Condition 1: "The restriction is reasonable, non-arbitrary, and non-discriminatory"[23]

Essential information needed to demonstrate this condition includes: (1) Evidence that a current or projected noise or access problem exists, and that the proposed action(s) could relieve the problem; (2) evidence that other available remedies are infeasible or would be less cost-effective; (3) evidence that the noise or access standards are the same for all aviation user classes or that the differences are justified.[24] To satisfy Condition 1, all essential elements for that condition must be supported by substantial evidence.

The FAA finds that LAWA's analysis with respect to the first and second essential elements of Condition 1 does not demonstrate by substantial evidence that the proposed restriction is reasonable and non-arbitrary, and therefore, LAWA has not satisfied Condition 1.

Evidence submitted by LAWA in support of Condition 1

Evidence that a current or projected noise or access problem exists, and that the proposed action could relieve the problem

LAWA has defined the airport noise study area for its proposed restriction as the area of land within the Community Noise Exposure Level (CNEL) 65 dB contour around LAX.[25] LAWA states that a noise problem at LAX "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".[26] These flights are referred to as "non-conforming" nighttime aircraft departures.

LAWA presented evidence of the noise problem within the study area using calculations of the number of people residing within the CNEL 65 dB contour and nighttime awakenings. LAWA estimated the number of residents within the contour to be 57,744 in 2013 and projected the number of residents to be 63,343 by 2018. In addition, LAWA presented a sleep disturbance analysis using a supplemental noise metric[27] based on the standard developed by the American National Standards Institute (ANSI)[28] for predicting sleep disturbance.[29] Within the CNEL 65 dB contour, LAWA estimated that there were 23,061 awakenings per night due to nighttime aircraft noise in 2013 and projected that an estimated 26,507 awakenings per night will occur in 2018.[30] LAWA also reviewed complaints and identified eleven complaints related to non-conforming nighttime departures within

[23] 49 U.S.C. § 47524(c)(2)(A).
[24] 14 C.F.R. § 161.305(e)(2)(i).
[25] The primary metric used by the FAA to determine noise exposure is the Day/Night Average Sound Level (DNL). The FAA recognizes CNEL as an accepted metric in lieu of DNL in California.
[26] LAWA Part 161 application
[27] Part 161 allows use of supplemental metrics consistent with 14 CFR Part 150 to provide additional noise analysis when desired by airport operators. 56 Fed. R. 48661, (Sept. 25, 1991). As part of its review of LAWA's application for completeness, the FAA acknowledged that an applicant may use a supplemental metric to analyze the problem a proposed restriction is intended to address, but reminded LAWA that DNL (i.e., CNEL in California) remains the primary metric under Part 161 regulations. (Letters from FAA to LAWA, Mar. 15, 2013 and Aug. 2, 2013).
[28] ANSI is a private non-profit organization that oversees the development of voluntary consensus standards for products, services, processes, systems, and personnel.
[29] 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 predicts awakenings associated with outdoor noise events in home settings where people are familiar with the neighborhood noise environment. The standard assumes that the sleepers have normal hearing with no sleep disorders, and does not apply to persons under 18 years of age, individuals with sleep disorders, or individuals in poor health. The standard is primarily based on sleep awakenings caused by aircraft noise, but may also be applicable to other discrete, single events such as the sound of a train passing by, a single small-arms gunshot, or the sound of a coupler bang in a train marshalling yard. The standard is not applicable to predictions of sleep awakenings caused by multiple noise events that occur in a very short time.
[30] LAWA's per night awakenings are based on an annual average, i.e., calculated yearly awakenings divided by 365 days per year.

the airport noise study area over a ten-year period.[31]

LAWA's stated goal for the restriction is "[t]o 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 am when the airport is in Over-Ocean Operations or Westerly Operations."[32] LAWA's analysis assumed an average of 65 non-conforming flights per year, based on historical data. LAWA projected that the elimination of these 65 non-conforming flights by its proposed restriction would reduce the number of residents within the CNEL 65 dB contour in 2018 from 63,343 to 63,227—a total reduction of 116 residents, or 30 residences.[33] Using a supplemental noise metric, LAWA calculated the number of nighttime awakenings predicted to occur with and without the proposed restriction. The awakenings analysis indicated that the proposed restriction would reduce awakenings by an annual average of 50 a night out of a total of 26,507 awakenings per night in 2018.[34] On an annual basis, awakenings would be reduced by 18,000 in 2018.

LAWA's documentation also included information on sleep awakenings and complaints beyond the CNEL 65 dB contour. The Part 161 regulations require an applicant to define an airport noise study area that is encompassed by DNL or CNEL contours.[35] In its review of LAWA's application for completeness, the FAA noted that most of LAWA's identified sleep awakenings fell outside of the area defined by the CNEL 65 dB contour. The FAA explained that the Part 161 regulations allow an applicant the flexibility to select an airport noise study area beyond the CNEL 65 dB contour, but there must be only one airport noise study area that is clearly defined and encompasses the problem that a proposed restriction is intended to address. LAWA could either select an airport noise study area that included the entirety of its sleep awakenings analysis and provide CNEL data for that larger area or select an airport noise study area that has the CNEL 65 dB contour as its outer boundary.[36] The FAA pointed out that the selection of the CNEL 65 dB contour as the outer boundary of the airport noise study area would exclude all geographic areas beyond this contour from the Part 161 analysis and review.[37] Because LAWA subsequently chose to use the CNEL 65 dB contour as the outer boundary of its airport noise study area, additional information beyond this contour is not within the scope of the FAA's Part 161 review.[38]

Evidence that other available remedies are infeasible or would be less cost-effective

With respect to other available remedies, LAWA stated that it has aggressively pursued nonrestrictive means that have resulted in some success in reducing non-conforming operations at LAX. LAWA described its 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 has sent letters to operators conducting non-conforming operations requesting information on each of the departures including engine type, destination, reason for an easterly departure, aircraft weight, and amount of fuel on board. (A sample letter is included in the Part 161 application.) LAWA also provides a table showing the number of letters sent for non-conforming occurrences between September 2011 and August 2012, and the number of responses received. LAWA states there is no clear evidence that the nonrestrictive measures have caused operators conducting non-conforming departures to alter their behavior and no clear evidence of a

[31] The FAA does not rely on complaints as a measure of community impact, but notes that the bulk of complaints discussed in LAWA's Part 161 application were outside the airport noise study area.
[32] LAWA Part 161 application.
[33] See Errata to LAWA's 14 CFR Application, revised May 2014, Table B.
[34] LAWA uses annual average awakenings in its analysis, but notes that sleep disturbance from non-conforming departures does not occur on an "annual average day," but instead on a limited number of days amounting to about 30 nights per year.
[35] *See* 56 Fed. Reg. 48661, 48669-70 (Sept. 25, 1991).
[36] Letter from FAA to LAWA, Mar. 15, 2013.
[37] Letter from FAA to LAWA, Aug. 2, 2013.
[38] LAWA's information on the "unique characteristics" of non-conforming departures, i.e, that such departures tend to make tighter right turns than conforming easterly departures and overfly residences at lower altitudes, is likewise related to effects outside of LAWA's airport noise study area and not within the scope of this Part 161 review.

declining trend in non-conforming operations. LAWA concludes that voluntary mechanisms are insufficient because they do not prevent the continuing occurrence of non-conforming operations and, therefore, a mandated runway use restriction is the only feasible course of action to eliminate non-conforming operations.

LAWA provided information on LAX's sound insulation program, which as of May 2009 had resulted in the sound insulation of 9,716 residential units, with another 17,578 units proposed for sound insulation. LAWA states that its sleep awakenings analysis conservatively assumed all homes within the airport noise study area to be sound insulated and assumed an outdoor-to-indoor noise level reduction of 27.5 dB[39] in sound-insulated homes. LAWA's Part 161 application also includes information on other compatible land use measures, including land recycling, building codes, and noise disclosure. LAWA concludes that there is no feasible or cost-effective non-restrictive means to eliminate the awakenings within the airport noise study area associated with non-conforming flights.

Evidence that the noise or access standards are the same for all aviation user classes or that the differences are justified

With respect to this evidence, LAWA includes with its application a draft of the specific City of Los Angeles ordinance that explicitly provides that the proposed restriction "shall apply in all respects to each and every aircraft that now operates or in the future shall operate at the airport" with the following exemptions:

- 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.

The draft ordinance also states that the restriction would not apply when the FAA operates LAX in Easterly Operations or to an aircraft operator instructed otherwise by an FAA air traffic controller.

FAA's Findings on Condition 1

In the FAA's view, LAWA has arbitrarily defined LAX's noise problem for purposes of this Part 161 application as one of nighttime noise associated with easterly non-conforming aircraft departures.[40] LAWA has proposed to relieve this problem by banning such departures, which would benefit less than 0.2% (two-tenths of a percentage point) of the population within the airport noise study area. The FAA finds this to be an unreasonable description of LAX's noise problem and further finds that LAWA's proposed action would not meaningfully relieve LAX's noise problem. A noise reduction to 0.2% of the population within the CNEL 65 dB contour in 2018 would be extremely small noise relief, while imposing a disproportionate negative effect on nighttime aircraft departures at LAX as discussed in detail under the analysis for Condition 2. In addition, the FAA finds that LAWA has not adequately evaluated non-restrictive means to address the noise problem.

FAA analysis of LAWA's evidence that a current or projected noise or access problem exists, and that the proposed action could relieve the problem

[39] The 27.5 dB outdoor-to-indoor noise level reduction is measured using A-weighted Sound Exposure Level (SEL). SEL is a composite metric that represents both the intensity of a sound and its duration. SEL is used in the calculation of sleep awakenings using the ANSI/ASA S12 9-2008/Part 6.

[40] In its application, LAWA estimates non-conforming departures to average 65 departures a year. The FAA notes that based on information LAWA has provided , this number appears to be highly variable year-to-year. LAWA data since 2010 shows a total of 44, 56, and 54 non-conforming departures during 2011, 2012, and 2013, respectively, with 2014 non-conforming departures on pace to be well below 2013 levels. LAWA did not analyze whether foreseeable changes in fleet mix would affect the number of non-conforming departures in the future.

The FAA finds that LAWA has not provided substantial evidence that the proposed action could relieve LAX's noise problem. In its Part 161 application, LAWA asserts that evidence of nighttime awakenings associated with non-conforming departures provides a reliable basis for presenting the substantial evidence for a noise problem under Part 161. Although the FAA considered LAWA's evidence of sleep awakenings, as discussed below, we have repeatedly reminded LAWA that DNL (i.e., CNEL in California) remains the primary metric under Part 161 regulations.[41] Therefore we first turn to the evidence provided by LAWA of the noise problem in terms of the CNEL.

LAWA has estimated that the number of residents within the CNEL 65 dB contour at LAX in 2013 was 57,744 and has projected that number to increase to 63,343 by 2018. Noise exposure at levels of CNEL 65 dB and higher is significant, and the FAA considers significant noise exposure affecting tens of thousands of people to be a problem. The DNL and CNEL metrics used by FAA and the State of California, respectively, account for the added intrusiveness of sounds that occur during normal sleeping hours by counting each nighttime operation as 10 operations. LAWA has calculated that the proposed restriction would remove 116 residents from the CNEL 65 dB contour by 2018. This would amount to only 0.2% of the 63,343 people projected to reside within the CNEL 65 dB contour in that year. The projected noise benefit for 116 residents assumes that all non-conforming departures would be eliminated by the proposed restriction. This projected benefit is quite small to begin with and is likely to be overly optimistic because the FAA would expect some, and perhaps all, non-conforming aircraft operators to continue to depart to the east and pay the fine imposed by LAWA for such departures rather than off-loading, based on a comparison of costs as discussed in more detail under Condition 2. LAWA's projected noise benefit would be commensurately reduced by each non-conforming departure.

The FAA additionally reviewed LAWA's supplemental metric—a sleep awakenings analysis within the CNEL 65 dB contour. LAWA used the ANSI standard to calculate the number of nighttime awakenings that would occur with and without the proposed restriction. LAWA's awakenings analysis indicated that the proposed restriction would reduce awakenings by an annual average of just 50 a night out of a total of 26,507 average awakenings per night within the CNEL 65 dB contour, or 0.2% of awakenings, in 2018.[42] Figure 16 in LAWA's Part 161 application also shows that some areas close to the airfield would experience an increase in awakenings with the proposed restriction. LAWA does not explain these increases, but has accounted for them in their sleep awakenings computations.

The ANSI standard represents a method that can be used to predict sleep disturbance, but does not include criteria to evaluate the impact from nighttime aircraft noise (i.e., how many awakenings would constitute a significant impact). TheThe ANSI standard has been recommended by the Federal Interagency Committee on Aviation Noise (FICAN) to estimate the number of awakenings due to multiple aircraft events. However, FICAN's recommendation is not without reservations as stated below:

> 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.[43]

There is considerable uncertainty regarding the relationship between the estimation of sleep

[41] *See* Letter from FAA to LAWA, Mar. 15, 2013; Letter from FAA to LAWA, Aug. 2, 2013.
[42] The number of awakenings is likely less than estimated since LAWA assumed an outdoor-to-indoor noise level reduction of 27.5 dB in sound-insulated homes. However, acoustical tests submitted to FAA for years 2002-2012 on LAX's sound insulation program report much better indoor noise reductions. Of approximately 700 sound-insulated bedrooms, over 80% were found to have noise reductions between 35 and 44 dB. Less than 1% showed a noise reduction of less than 30 dB. The number of anticipated awakenings would be reduced if the sleep awakenings analysis was recalculated using higher indoor noise reduction levels.
[43] Federal Interagency Committee on Aviation Noise (FICAN), FICAN Recommendation for use of ANSI Standard to Predict Awakenings from Aircraft Noise, December 2008, accessed at: http://www.fican.org/pages/findings.html.

awakenings and the impact of awakenings on sleep quality. Circular E-C184: Critical Issue in Aviation and the Environment 2014, published by the Transportation Research Board in April 2014, acknowledged that an area where additional research is needed is the relationship between aviation noise and sleep disturbance. The FAA is pursuing research in this area, but until that research is more mature, the FAA continues to rely on the DNL or CNEL metric to make determinations on noise impact, including findings under Part 161. As previously described, the DNL and CNEL metrics account for the added intrusiveness of sounds that occur during normal sleeping hours by counting each nighttime operation as 10 operations. The FAA notes that LAWA's sleep disturbance analysis did not produce results that showed a greater noise benefit than its CNEL benefit (i.e., both analyses showed a 0.2% reduction within the CNEL 65 dB) and, therefore, does not provide additional persuasive evidence with respect to relieving LAX's noise problem.

LAWA also provided complaint information. The FAA does not rely on complaints as a measure of community impact, but notes the extremely small number of complaints – 11 over 10 years – that LAWA reported in relation to non-conforming nighttime aircraft departures within the airport noise study area.

LAWA has arbitrarily established a goal of eliminating easterly non-conforming departures, without considering their relative contribution to the noise problem at LAX. Non-conforming operations are a small percentage of operations at LAX, amounting to 0.01% of LAX's total operations, or one operation in ten thousand, according to LAWA's Part 161 application. The restriction would only apply to non-conforming easterly departures during Westerly Operations or Over Ocean operations between midnight and 6:30 a.m. These flights account for only a small fraction of the aircraft that contribute to LAX's nighttime noise. Between midnight and 6:30 am, there are many more conforming than non-conforming easterly departures,[44] and there are also nighttime easterly departures between 10:00 pm and midnight and between 6:30 and 7:00 a.m.[45] In addition, arrivals from the east, which LAWA does not address in its application, contribute to nighttime noise and the CNEL 65 dB contour.[46] Based on LAWA's own analysis, the non-conforming departures are a small minority of the operations that contribute to noise at LAX on either a 24-hour basis or at night.

Based on the operations and CNEL data presented by LAWA, the proposed restriction would have a negligible impact on nighttime noise at LAX. In fact, LAWA acknowledges that the proposed restriction would have no significant effect on the size and shape of the CNEL 65 dB contour. However, the proposed restriction would have a much larger adverse impact and cost than LAWA has assumed, based on the FAA's analysis presented under Condition 2.

FAA analysis of LAWA's evidence that other available remedies are infeasible or would be less cost-effective

The FAA finds that LAWA has not provided substantial evidence that there is no feasible or cost-effective non-restrictive means to address the noise problem. LAWA appears to equate "feasible" with complete elimination of non-conforming departures, which disregards the extremely high rate of overall adherence to LAWA's voluntary runway use policy, under which approximately 99% of nighttime operations depart to the west.[47] LAWA's conclusion that voluntary efforts are infeasible is

[44] The non-conforming operations analysis presented in LAWA's Part 161 application indicates that from April 2010 through March 2011 there were 540 nighttime departures to the east between midnight and 6:30 a.m., with only 56 of these being non-conforming.

[45] There were over 300 easterly departures between 10:00 pm and midnight and between 6:30 and7:00 am which are also considered to be nighttime hours for purposes of community annoyance. See Los Angeles International Airport – Preferential Runway Use Policy, Report on LAWA's Implementation of the Preferential Runway Use Policy (April 11, 2014) Appendix I, pp. 69-71.

[46] Over the past few years 22-35% of arrivals during the nighttime hours were from the east. *See* Los Angeles International Airport – Preferential Runway Use Policy, Report on LAWA's Implementation of the Preferential Runway Use Policy (April 11, 2014) Appendix I, pp. 69-71.

[47] *See* Los Angeles International Airport – Preferential Runway Use Policy, Report on LAWA's Implementation of the Preferential Runway Use Policy (April 11, 2014) Appendix I, pp. 69-71. The data provided for calendar years 2012 and 2013 indicate that 99% of departures were in west flow during the hours that the over-ocean procedure is in use (midnight to 6:30 a.m.), as well as during the nighttime hours of 10:00 p.m. to 7:00 a.m. The data for calendar year 2011 show a 98% west flow rate for departures during these time periods.

based on the fact that these efforts have not *completely eliminated* non-conforming flights – LAWA does not offer any analysis of whether these efforts have reduced or could further reduce these flights. For example, LAWA does not provide any evidence regarding the effectiveness of its initiative to improve voluntary compliance with the Over-Ocean procedures through letters to operators of non-conforming flights.[48] By limiting its consideration of other available remedies to those that would seek to completely eliminate non-conforming nighttime departures, LAWA ignores or discounts measures that could address the noise problem at LAX through other means.

LAWA summarily dismisses sound insulation of residences, although LAWA has a sound insulation program for LAX that has been supported by FAA funding and states in its Part 161 application that it does not expect to change its sound insulation program if the proposed restriction is put into effect. The 30 residences that could be eliminated from the CNEL 65 dB contour with the proposed restriction in place have, according to LAWA, been sound insulated or declined an offer of sound insulation.[49] Sound insulation reduces noise inside homes. The same noise audits that performed acoustical testing of noise level reductions inside sound insulated homes within the LAX CNEL 65 dB contour (see footnote 4545) also modeled indoor CNEL levels within these homes. The modeled CNEL levels in approximately 700 sound insulated bedrooms were found to be primarily in the range of CNEL 25 to 34 dB (about 76 percent of the bedrooms). Less than 3 percent of sound insulated bedrooms were found to be above CNEL 40 dB, with no levels above the mid 40's.[50] These results suggest that sound insulation should not have been dismissed as an infeasible solution.[51]

FAA analysis of LAWA's evidence that that the noise or access standards are the same for all aviation user classes or that the differences are justified

LAWA's proposal meets this essential element and the unjust discrimination requirement within Condition 1.[52] For purposes of Part 161, the FAA requires evidence that noise or access standards are the same for all aviation user classes, or that the differences are justified. On its face, the restriction presented in the application imposes the same requirements on all aviation user classes, with certain previously described exemptions. Similar aircraft are not treated differently under LAWA's proposed restriction; the approach is evenhanded. The proposed restriction does not result in the denial of access – or restricted access – to certain aircraft that are of a certain class or category but not to others of the same class or category. It is not the case that the proposal would result in some aircraft being subject to the penalty while other, equally noisy or heavy operations would not be subject to the penalty. The proposal would affect all aircraft taking off during nighttime hours between midnight and 6:30 AM, and is rationally based upon aircraft noise.

FAA FINDING: LAWA's analysis with respect to the first and second essential elements of Condition 1 does not demonstrate by substantial evidence that the proposed restriction is reasonable and non-arbitrary; therefore, LAWA has not satisfied Condition 1.

[48] According to the sample letter included in the application, LAWA asks operators to provide information to enable LAWA to better assess the cause of the non-conforming flight and to work together with the operator to minimize the impact of aircraft noise on affected communities. Given the stated purpose of these letters, any benefits of this measure could take some time to become evident; however, the table provided in the application only covers responses received for the 12-month period from September 2011 to August 2012.

[49] LAWA is obligated under State of California Airport Noise Standards to mitigate incompatible land uses, i.e., residential, through sound insulation or land acquisition and/or recycling.

[50] To put some context around these CNEL levels, levels of 20-30 dB are typical for wilderness areas, and levels of 48-52 dB are typical outdoor levels for quiet suburban residential neighborhoods.

[51] LAWA's application also mentions other compatible land use measures, including land recycling, building codes, and noise disclosure, but does not provide any analysis of the feasibility of such measures.

[52] As the FAA has previously explained, both Condition 1 of ANCA (reasonable, non-arbitrary, and non-discriminatory) and the statutory grant assurance requiring access on fair and reasonable terms, without unjust discrimination articulate the same standard for review of airport noise and access restrictions. See Decision on the Application of Burbank-Glendale-Pasadena Airport Authority, p. 5. Safety aspects that fall under the reasonableness prong of Grant Assurance 22 are addressed in Condition 4.

Condition 2: "The restriction does not create an undue burden on interstate or foreign commerce."[53]

Essential information needed to demonstrate this statutory condition includes evidence, based on a cost-benefit analysis, that the estimated potential benefits of the restriction have a reasonable chance to exceed the estimated potential cost of the adverse effects on interstate and foreign commerce. Among other factors, the analysis must consider:

- The effect of the proposed restriction on operations of aircraft by aviation user class and on the volume of passengers and cargo for the year the restriction is expected to be implemented and for the forecast timeframe;
- The estimated costs of the proposed restriction and alternative nonaircraft restrictions;
- Estimated benefits of the proposed restriction and alternative restrictions.[54]

The FAA finds that LAWA's analysis does not demonstrate by substantial evidence that the proposed restriction does not create an undue burden on interstate and foreign commerce, and therefore, LAWA has not satisfied Condition 2.

Evidence submitted by LAWA in support of Condition 2

Evidence that the estimated potential benefits of the restriction have a reasonable chance to exceed the estimated potential cost of the adverse effects on interstate and foreign commerce

To support this condition, LAWA submitted a cost-benefit analysis that estimates the cost impact of a runway use restriction on air carriers and passengers. Based on that analysis, LAWA determined the benefits of the restriction would exceed the costs. LAWA considered the effect of the proposed restriction on operations of aircraft, by aviation user class, and on the volume of passengers and cargo for 2013 (the year LAWA expected the restriction to be implemented) and for the forecast 20-year timeframe.

LAWA developed a cost analysis for two scenarios that are differentiated by assumptions of the amount of weight offloaded for an air carrier to be able to depart to the west with a tailwind and the time required to offload. Scenario 1 assumes that an air carrier would need to reduce takeoff weight by 10,000 pounds, and that this would require 10 minutes. Scenario 2 assumes the air carrier would have to reduce takeoff weight by 20,000 pounds, which would require 20 minutes.

LAWA's analysis quantifies costs incurred by commercial air carriers and their customers for each scenario, based on a 20-year forecast of the annual number of non-conforming departures affected by the proposed restriction, which LAWA assumes would average 65 per year. The 65 non-conforming departures consist of 13 departures performed by cargo carriers and 52 departures performed by passenger carriers. LAWA concludes that the cost of the restriction during year 1 would be approximately $800,000 under Scenario 1 and $2.5 million under Scenario 2.

With respect to benefits, LAWA forecasts the reduction in sleep awakenings based on eliminating non-conforming departures and provides evidence of the proposed restriction's effect on the number of residents within the CNEL 65 dB contour. LAWA also discusses benefits realized from an assumed reduced workload for controllers and a reduction in fuel burn by carriers. LAWA notes that the Part 161 regulations permit an applicant to consider qualitative benefits as well as monetized or quantified benefits, and has opted not to monetize benefits. Based on its analysis LAWA asserts that the qualitative benefits from a reduction in sleep awakenings outweigh the costs of a runway restriction.

[53] 49 U.S.C. § 47524(c)(2)(B).
[54] 14 C.F.R. § 161.305(e)(€(2)(ii)(A).

FAA's Findings on Condition 2

The FAA has reviewed LAWA's cost-benefit analysis and also performed its own analysis of the estimated costs of the proposed restriction. The FAA finds that LAWA's cost-benefit analysis does not demonstrate that the estimated potential benefits of the restriction have a reasonable chance to exceed the estimated potential cost of the adverse effects on interstate and foreign commerce. Specifically, the FAA finds that LAWA's analysis:

- Understates the loss of operating profits by approximately $1.9 million per year due to compensation paid to offloaded passengers based on the LAWA forecast of 52 non-conforming passenger departures;
- does not estimate the cost to operators for delayed crew which the FAA estimates to be approximately $13,000 annually for a 10-minute delay, and $26,000 annually for a 20-minute delay based on the 54 non-conforming departures per year in the FAA analysis,[55]
- does not address adequately the cost of auxiliary power unit (APU) [56] operation or provision of electrical power by the airport during offloading delay;
- does not adequately quantify cargo handling costs;
- overstates the qualitative noise benefits of the proposed restriction, when the quantitative evidence shows that population exposed to significant noise and sleep awakenings will each be reduced by just 0.2%[57];
- does not address the effect on benefits should operators choose to conduct a non-conforming departure and pay the fine; and
- asserts but does not substantiate an unquantified savings in controller workload costs.

FAA analysis of LAWA's evidence of the estimated potential cost of the adverse effects on interstate and foreign commerce

The proposed restriction would impose costs on carriers in weather conditions (i.e., tailwinds) that currently lead to non-conforming departures. Air carriers would have to depart to the west (Over-Ocean or Westerly Operations) between midnight and 6:30 am or pay a fine, unless the airport is configured for easterly operations. The restriction would impose limitations on air carrier flight operations because the choice to depart to the east would no longer be permitted, unless a fine is paid to LAWA. Under the restriction operators of heavily-loaded aircraft would have to make choices: 1) delay departure and offload weight to compensate for the high tailwinds, or 2) pay a fine to depart to the east.[58] The focus of the FAA analysis is on the cost and feasibility of LAWA's proposal. If this restriction were in effect, carriers would consider the cost of a conforming departure to the west against that of a non-conforming departure to the east and be expected to choose that which is most cost effective. Either decision potentially reduces air carrier profitability and has important operational implications. A choice to perform a non-conforming flight eliminates the cost of delay for offloading weight, but requires an operator to pay a fine; conforming flights would impact passengers and crew and also would decrease operating profits.[59]

[55] The FAA used the number of non-conforming departures for the most recent complete year (54 non-conforming departures in 2013) in estimating costs. This is consistent with recent trends in LAX traffic (see footnote 43) These are 11 fewer non-conforming departures than LAWA assumed. The FAA's use of fewer non-conforming departures is in LAWA's favor since calculated costs would be higher using LAWA's 65 non-conforming departures.

[56] Auxiliary Power Units provide electric power to run aircraft systems such as air conditioning, instruments, etc. APU's are typically used when the main engines are not operating.

[57] See discussion under Condition 1. In Condition 1, the FAA also performed an analysis that favors LAWA by using LAWA's average of 65 non-conforming departures, which raises the potential benefits above what would be calculated using 54 non-conforming departures.

[58] Operators also could choose to wait until wind conditions were more favorable. The FAA does not have data to estimate costs associated with this option.

[59] The FAA's review shows that that LAWA's analysis of the costs and benefits of the restriction does not fully address the considerations identified in the Part 161 regulations: 14 C.F.R. §§ 161.305(e)(2)(ii)(1)(ii)(B); and 161.305(e)(2)(ii)(1)(ii)(D).

The FAA's Cost Estimate Due to the Proposed Restriction

LAWA estimated the impact of the requirements for calendar year 2013 using an assumption of 65 non-conforming departures, which is the average number of all non-conforming departures reported between 2001 and 2010. The FAA chose to study in detail the most recent full year, 2013, as the data are actual, and not estimated. This allowed the FAA to obtain more detailed data, which in turn supported a more comprehensive analysis of costs. Using the level of 2013 non-conforming departures as the base, the FAA estimated costs of the proposed restriction on 54 non-conforming departures for three scenarios. The 54 non-conforming departures used in the FAA analysis include 16 cargo departures and 38 passenger departures. The individual flight characteristics of the 54 non-conforming departures are identified in **Table 1** (next page). All but two of these departures are to foreign destinations, thus the costs calculated would have a particular effect on foreign commerce.

The methodology used for Scenario 1 and Scenario 2 is similar to that used by LAWA. In these two scenarios it is assumed that a carrier incurs a delay for offloading weight in order to depart over the ocean. In the first scenario, 10,000 pounds are offloaded, causing an assumed departure delay of 10 minutes; in the second scenario 20,000 pounds is offloaded, causing an assumed departure delay of 20 minutes.[60]

The FAA also prepared a third scenario. This scenario compares the results from Scenario 1 and Scenario 2 for each of the 54 non-conforming departures against a penalty assessed by LAWA for a carrier's choice to depart to the east. The purpose of this scenario is to determine whether a carrier's choice to perform a non-conforming flight in exchange for payment of a fine is less detrimental to profits than the cost of offloading weight to perform a conforming flight. If a carrier decides to accept a fine to depart to the east, the intended noise relief would not materialize.

FAA Assumptions

The FAA's scenarios use the same assumptions to estimate costs with the following exceptions:

1. As discussed below, FAA does not agree that operators will offload bags separately from passengers. Therefore, FAA assumes that the offloaded weight would include an average of 10 passengers who would be involuntarily denied boarding.
2. FAA does not assume some delay is the result of other causes. Rather, the FAA attributes the 10-minute delay solely to the offloading of cargo, passengers and their bags.[61]
3. FAA estimates crew costs, cargo handling and APU costs.

The FAA believes that it is likely that the offloaded weight consists either partially or wholly of passengers that are involuntarily denied boarding, as discussed below. The FAA looked at Form 41 carrier filings to estimate the amount of freight that may have been carried by the non-conforming departures. Based on these filings, it is estimated that 17 of the 38 non-conforming passenger departures in 2013 were carrying about 5,400 pounds of freight on average, well less than 10,000 pounds of freight.[62] Thus, to make up the difference in weight to be offloaded, the FAA believes carriers would choose to involuntarily deny boarding to passengers under this scenario. The FAA does not believe passengers continue to their destinations while their bags are offloaded, but rather passengers and their bags are a unit and travel together. For these flights the average number of denied passenger boardings would be about 20. To simplify the arithmetic, the FAA spreads these

[60] LAWA assumes that the offloading of weight coincides with other activities required for departure and therefore attributes a range of 25 percent to 75 percent of the delay to the restriction.

[61] FAA further assumes that offloaded passengers and bags will have to be matched. Although this calls into question the assumption that the delay would be limited to 10 minutes under Scenario 1 and 20 minutes under Scenario 2, FAA uses LAWA's delay assumption for this analysis.

[62] Air carrier filings to the U.S. DOT on Form 41. T100 segment data contains freight carried (in pounds) on a monthly basis by carrier, by equipment, by segment. The freight carried is divided by departures to estimate the average payload of a departure.

TABLE 1

Nonconforming Departures Reported by Los Angeles World Airports - (CY 2013)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Type Operation	Arrive City	Mo	Local Date	Local Time	Call Sign	Equip-ment Type	Carrier
1	Cargo	Frankfurt	Jan	1/13/2013	2:39	BOX411	B77L	Aerologic GMBH
2	Cargo	Frankfurt	Mar	3/3/2013	3:00	BOX411	B77L	Aerologic GMBH
3	Cargo	Shanghai	Mar	3/11/2013	5:18	CAO1060	B744	Air China Cargo
4	Cargo	Seoul	May	5/20/2013	5:52	AAR287	B744	Asiana Airlines
5	Cargo	Seoul	Jun	6/3/2013	4:57	GTI242	B744	Atlas Air
6	Cargo	Kansai Intl, Osaka	Jan	1/12/2013	6:01	CAL5125	B744	China Air Lines
7	Cargo	Shanghai	Jun	6/2/2013	2:59	CKK224	B77L	China Cargo Airlines
8	Cargo	Seoul	Jul	7/14/2013	5:57	KAL8236	B744	Korean Airlines
9	Cargo	Narita	Oct	10/2/2013	5:33	KAL224	B744	Korean Airlines
10	Cargo	San Francisco	Nov	11/7/2013	0:08	KAL213	B748	Korean Airlines
11	Cargo	Narita	May	5/20/2013	5:49	NCA101	B748	Nippon Cargo Airlines
12	Cargo	Narita	Oct	10/14/2013	5:52	NCA101	B748	Nippon Cargo Airlines
13	Cargo	Seoul	May	5/28/2013	3:19	PAC997	B744	Polar Air Cargo
14	Cargo	Seoul	Jun	6/2/2013	4:34	PAC716	B744	Polar Air Cargo
15	Cargo	Seoul	Jun	6/4/2013	5:46	PAC716	B744	Polar Air Cargo
16	Cargo	Leipzig	Apr	4/12/2013	3:45	SOO097	B77L	Southern Air
17	Pax	Guadalajara	Jan	1/13/2013	1:16	AMX467	B737	Aeromexico
18	Pax	Beijing	Jan	1/13/2013	1:00	CCA984	B773	Air China
19	Pax	Beijing	Jan	1/31/2013	1:14	CCA984	B773	Air China
20	Pax	Beijing	Apr	4/7/2013	1:44	CCA984	B77W	Air China
21	Pax	Beijing	Apr	4/10/2013	2:00	CCA984	B77W	Air China
22	Pax	Beijing	Oct	10/7/2013	1:46	CCA984	B77W	Air China
23	Pax	Mexico City	Jan	1/13/2013	1:17	ASA256	B738	Alaska Airlines
24	Pax	Tokyo Intl	Jan	1/13/2013	0:58	ANA1005	B772	All Nippon Airways
25	Pax	Tokyo	Nov	11/23/2013	1:32	ANA1005	B772	All Nippon Airways
26	Pax	Tokyo	Dec	12/21/2013	0:45	ANA1005	B772	All Nippon Airways
27	Pax	Seoul	Apr	4/10/2013	0:50	AAR203	B772	Asiana Airlines
28	Pax	Seoul	Jun	6/2/2013	0:51	AAR203	B772	Asiana Airlines
29	Pax	Seoul	Dec	12/28/2013	1:07	AAR203	B772	Asiana Airlines
30	Pax	Honk Kong	Jun	6/2/2013	1:23	CPA881	B77W	Cathay Pacific
31	Pax	Hong Kong	Nov	11/21/2013	0:38	CPA881	B77W	Cathay Pacific
32	Pax	Taoyuan Taiwan	Apr	4/10/2013	1:49	CAL007	B744	China Air Lines
33	Pax	Taoyuan Taiwan	Jun	6/2/2013	1:33	CAL007	B744	China Air Lines
34	Pax	Taoyuan Taiwan	Oct	10/1/2013	1:43	CAL007	B744	China Air LInes
35	Pax	Minneapolis	Feb	2/21/2013	0:57	DAL2268	B763	Delta Air Lines
36	Pax	Taoyuan Taiwan	Apr	4/7/2013	0:37	EVA15	B77W	EVA Airways
37	Pax	Taoyuan Taiwan	May	5/29/2013	2:39	EVA15	B77W	EVA Airways
38	Pax	Brisbane	Jan	1/19/2013	1:08	QFA16	B744	Qantas Airways LTD
39	Pax	Sydney	Jan	1/19/2013	2:21	QFA108	B744	Qantas Airways LTD
40	Pax	Brisbane	Jan	1/25/2013	0:17	QFA16	B744	Qantas Airways LTD
41	Pax	Brisbane	Jan	1/28/2013	0:15	QFA16	B744	Qantas Airways LTD
42	Pax	Sydney	May	5/29/2013	3:30	QFA108	B744	Qantas Airways LTD
43	Pax	Sydney	Jun	6/2/2013	0:48	QFA108	B744	Qantas Airways LTD
44	Pax	Sydney	Jul	7/11/2013	3:33	QFA108	B744	Qantas Airways LTD
45	Pax	Brisbane	Sep	9/18/2013	1:04	QFA16	B744	Qantas Airways LTD
46	Pax	Sydney	Oct	10/1/2013	0:45	QFA108	B744	Qantas Airways LTD
47	Pax	Sydney	Oct	10/2/2013	0:27	QFA108	B744	Qantas Airways LTD
48	Pax	Melbourne	Nov	11/7/2013	0:02	QFA94	A388	Qantas Airways LTD
49	Pax	Brisbane	Nov	11/21/2013	0:20	QFA16	B744	Qantas Airways LTD
50	Pax	Sydney	Dec	12/6/2013	0:34	QFA108	B744	Qantas Airways LTD
51	Pax	Brisbane	Jan	1/13/2013	1:30	VOZ8	B77W	Virgin Australia
52	Pax	Melbourne	Oct	10/2/2013	0:35	VOZ24	B77W	Virgin Australia
53	Pax	Melbourne	Nov	11/4/2013	0:44	VOZ24	B77W	Virgin Australia
54	Pax	Melbourne	Dec	12/16/2013	0:21	VOZ24	B77W	Virgin Australia

Column 2: Federal Aviation System Operations and Performance Data (ASPM, FSDS, TFSMC)

Columns 3-9: LAWA East Departures Report

across all 38 flights, for an average of 10 denied boardings per flight (the apparent discrepancy is due to rounding). The results of these calculations are shown in **Table 7**.

Of 38 affected passenger flights in 2013, 35 were to Pacific destinations. The FAA does not believe that passengers on international flights of long duration, such as these, will give up their seat willingly in exchange for $500 to $800 in compensation plus a seat on a later departure. Passengers are unlikely to be willing to voluntarily accept denied boarding because on international flights they generally have a relatively fixed schedule. For example, business passengers may miss meetings scheduled well in advance, while leisure travelers may lose a day of vacation; and both may have prepaid reservations and face the possibility of missed flight connections and limited flight choices.

The FAA's scenarios diverge from the LAWA analysis where it assumes passengers ***voluntarily*** give up their seats for compensation. Instead the FAA assumes that the offloaded passengers are ***involuntarily denied boarding.*** The FAA asserts that passengers with scheduled flights to the Pacific region are highly unlikely to volunteer their seats for compensation and a later flight. This belief is supported by several comments received from IATA on the LAWA Part 161 application.[63] In their comments, IATA states that offloading passengers and potentially delaying them onto flights the next day is an unnecessary passenger hardship and an operational disruption because being involuntarily denied boarding on a long-haul flight is a very different situation than a short-haul domestic flight from a passenger perspective. IATA further explains that there are usually more frequencies on short-haul operations, making re-routing on another flight much easier while a passenger denied boarding on a long-haul flight may be stranded for a much longer period as a result of lower flight frequencies. Additionally, the inconvenience and possible repercussions will be much greater on long-haul flights, as passengers often have onward connections.

IATA also notes that the proportion of non-U.S. passengers on long-haul international flights is also greater than on domestic flights and that the inconvenience, stress and costs for foreign passengers being stranded in the U.S. will inevitably be more significant than in the case of U.S. passengers being offloaded. At busy times of year, it may take several days to accommodate displaced passengers onto such flights, and weather conditions that force easterly departures may persist over several days, compounding the problem.

The FAA believes that LAWA's assertion that passengers would willingly give up their seats results in understated costs by at least $500 and as much as $800 per passenger. These amounts are the difference between the maximum mandatory compensation amount allowed by the U.S. DOT ($1,300) and LAWA's estimated compensation to passengers voluntarily giving up their seats ($500 for Asian destinations and $800 for Australian destinations).

Finally, the FAA included costs of APU fuel consumption for the period of delay. LAWA estimated APU fuel consumption but did not include this in their estimate of costs because of the availability of ground power. The FAA includes the APU costs as part of its analysis of costs due to offloading freight and bags because LAWA did not provide an estimate of charges (if any) for the use of ground power stations at gates used by international flights. In the absence of this information, FAA used APU costs as a proxy for such charges.

Scenario 1:

LAWA develops its analysis using the assumption that cargo and passenger carriers will offload weight in order to perform a conforming departure. In Scenario 1, 10,000 pounds of cargo, freight and/or passenger bags are offloaded, causing an assumed 10-minute delay in departure time. LAWA assumes that the offloading of weight coincides with other activities required for departure. FAA

[63] IATA Comments Received on 14 CFR Part 161 Application for Approval of a Runway Use Restriction at Los Angeles International Airport. Dated 28 July 2014.

assumes that the offloaded weight includes some passengers that are involuntarily denied boarding and attributes the 10-minute delay solely to the offloading of cargo, passengers and their bags. As discussed below, FAA does not agree that operators will offload bags separately from passengers.

Scenario 2:

In Scenario 2, the FAA uses LAWA's assumption that twice as much weight is offloaded in twice the time, as compared to Scenario 1. In this scenario LAWA assumes the cargo carriers offload an additional 10,000 pounds of freight, while passenger carriers make up the weight difference by compensating 44 passengers between $500 and $800[64]for ***voluntarily*** giving up their seat for a later departure.[65] The FAA Scenario 2 uses the same assumption as LAWA for the cargo carrier group. However, for the passenger carrier group, the FAA assumes 54 passengers (44 plus 10 from Scenario 1) are ***involuntarily denied boarding***, at a cost of $1,300 per passenger.[66] As in the case of Scenario 1, FAA assumes that offloaded passengers and bags will have to be matched.

Scenario 3:

In this scenario, the FAA evaluates a carrier's cost for performing a conforming departure from Scenarios 1 and 2 against the cost of paying a fine to depart to the east. The FAA assumes that the carrier chooses the least-cost alternative.

TABLE 2
LAWA Civil Penalties for Violating Runway Use Restriction

Number of Violations Per Carrier	LAWA Penalty
First violation	Not to exceed $2,500
Second violation within 1 year of first violation	Not to exceed $5,000
Third violation within 3 years of the first violation	Not to exceed $10,000
Each subsequent violation within 3 years of the first violation	Not to exceed $10,000

Source: LAWA Part 161 Application, p. 21.

Table 3 (next page) is a summary of the FAA and LAWA assumptions by scenario and carrier group.

[64] Los Angeles International Airport 14 C.F.R. Part 161 Application for Approval of a Runway Use Restriction, May 2014. Appendices - Page M-23. Compensation paid to passengers voluntarily giving up their seat is $800 for departures to Australian markets and $500 for departures to Asian markets. The LAWA study does not indicate if the 44 passengers that are compensated for willingly giving up their seat are compensated in cash or in an airline ticket valued at $500 to $800.

[65] Ibid. Page M-20, footnote 8. In performing aircraft weight and balance computations, operators use standard values for the weight of passenger and bags. Typically these values are established by the various national aviation authorities. LAWA's analyses uses the standard set by the European Aviation Safety Agency, which is 105 kg (or approximately 227.27pounds) for the combined weight of one passenger and bags. This weight consists of body weight and weight for baggage.

[66] 14 Code of Federal Regulations Chapter II Subpart A Part 250.9(b)(6).

TABLE 3
FAA and LAWA Assumptions Used to Estimate Costs

Cargo Carriers Assumptions			
Entity	**Scenario 1**	**Scenario 2**	**Scenario 3**
LAWA	10,000 pounds of freight offloaded 10-minute delay (assumes aircraft is already delayed for other reasons	20,000 pounds of freight offloaded 20-minute delay (assumes aircraft is already delayed for other reasons	Not Applicable
FAA	Same As LAWA except 10-minute delay is solely attributable to offloading	Same As LAWA except 20-minute delay is solely attributable to offloading	Not Applicable
Passenger Carriers Assumptions			
Entity	**Scenario 1**	**Scenario 2**	**Scenario 3**
LAWA	10,000 pounds offloaded (freight/bags) 10-minute delay (assumes aircraft is already delayed for other reasons)	Weight offloaded in Scenario 1 ***plus*** offloading of 44 passengers that ***voluntarily*** give up their seat for a later departure and compensated between $500 and $800 20-minute delay (assumes aircraft is already delayed for other reasons)	Not Applicable
FAA	Same as LAWA except that the 10,000 pounds offloaded per flight includes 10 passengers that are ***involuntarily*** denied boarding and provided mandatory compensation of $1,300 (maximum allowed by U.S. DOT) Same As LAWA except 10-minute delay is solely attributable to offloading	Same as LAWA except that the 20,000 pounds offloaded per flight includes 54 passengers that are ***involuntarily*** denied boarding and provided mandatory compensation of $1,300 (maximum allowed by U.S. DOT) Same As LAWA except 20-minute delay is solely attributable to offloading	The lesser of the operator cost calculated for Scenario 1 and 2 vs. paying a fine to LAWA to perform a NCD

Prepared by: FAA

Results of FAA's Cost Analysis

The FAA's analysis differs depending on whether the offloaded weight includes passengers. Therefore analysis is presented first for cargo carriers and then for passenger carriers. We note at the outset that of the 54 flights examined and listed in **Table 1**, all but two are to foreign destinations, thus the costs we calculate below would have a particular effect on foreign commerce.

Cargo Carrier Cost Estimates

Scenario 1 and 2 - Cargo Carriers

The estimated cost of the proposed restriction for cargo carriers evaluates the impact of a 10-minute departure delay (Scenario 1) and a 20-minute departure delay (Scenario 2) for offloading cargo.[67] The FAA believes that the cost of the delay provided by LAWA is understated on a per departure basis because it does not consider the additional crew costs incurred by the operator due to the delay, which the FAA was able to calculate.

[67] For purposes of this analysis, the FAA uses the LAWA assumption that the offloaded cargo imposes no social cost because it will leave later that day. Even with this assumption, there may be a loss of revenue to the operator offloading the cargo as another operator may carry it, and there may be loss due to perishable cargo, which the FAA does not attempt to calculate.

In **Table 4** below, the FAA shows the crew cost, by equipment type, for the cargo carriers performing non-conforming departures in 2013. The cost is calculated by dividing the crew cost per block hour by 60 minutes, which is then multiplied by the number of minutes of departure delay. The values in this table are estimated based on aircraft crew costs for U.S. flag carriers performing cargo operations. Data are not available to the FAA for foreign flag carriers, so crew costs identified below are used as a proxy to estimate delay costs. FAA's estimate also includes estimated costs for APU operation and cargo handling.

Table 4
Crew Cost Due to Delay
by Equipment Type
Cargo Carriers
CY 2013

Equipment Type	Airplane Crew Cost Per Block Hr.	Scenario 1 10 Minutes	Scenario 2 20 Mintues
747-400F	$2,015	$336	$672
747-800	1,603	267	534
777-300ER	1,072	179	357

Source: ESG Aviation Services.

The FAA estimates that a delay of 10 minutes and 20 minutes would result in total crew costs of $4,539, and $9,077, respectively, for the 16 cargo carriers performing non-conforming departures in 2013 (see **Table 5** on the following page). The summation of the crew cost for each one of the cargo airplanes divided by the total number of cargo airplanes (16) equals the average crew cost $283 for a 10-minute delay.

LAWA did not consider the delay to crew for offloading 10,000 pounds, and thus understates the cost of delay for the cargo carriers. Using the above estimated $283 average crew cost for a 10-minute delay, the total crew costs due to delay estimated by LAWA are understated by $3,679 for a 10-minute delay (13 departures * $283), and by $7,358 for a delay of 20 minutes (13 departures * $566).

TABLE 5
FAA Analysis - Annual Operator Costs Unaccounted for in LAWA Part 161 Study
CY 2013 Nonconforming Cargo Departures
Scenario 1 and 2

						In 2013$							
						Scenario 1 (10 min)				Scenario 2 (20 min)			
Mo.	Day	NCD Time (AM)	Operator	Flight #	Equip Type	Crew Cost	APU Cost*	Cargo Handling Cost**	Total Operator Cost	Crew Cost	APU Cost	Cargo Handling Cost	Total Operator Cost
1	13	2:39	Aerologic GMBH	BOX411	B77L	179	31	227	436	357	61	454	872
3	3	3:00	Aerologic GMBH	BOX411	B77L	179	31	227	436	357	61	454	872
3	11	5:17	Air China Cargo	CAO1060	B744	336	37	227	599	672	73	454	1,199
5	20	5:51	Asiana Airlines	AAR287	B744	336	37	227	599	672	73	454	1,199
6	3	4:57	Atlas Air	GTI242	B747	336	37	227	599	672	73	454	1,199
1	12	6:00	China Airlines	CAL5125	B744	336	37	227	599	672	73	454	1,199
6	2	2:59	China Cargo Airlines	CKK224	B77L	179	31	227	436	357	61	454	872
7	14	5:57	Korean Airways Company, I	KAL8236	B744	336	37	227	599	672	73	454	1,199
10	2	5:33	Korean Airways Company, I	KAL224	B744	336	37	227	599	672	73	454	1,199
11	7	0:07	Korean Airways Company, I	KAL213	B748	267	37	227	531	534	73	454	1,061
5	20	5:49	Nippon Cargo Airlines	NCA101	B748	267	37	227	531	534	73	454	1,061
10	14	5:52	Nippon Cargo Airlines	NCA101	B748	267	37	227	531	534	73	454	1,061
5	28	3:19	Polar Air Cargo	PAC997	B744	336	37	227	599	672	73	454	1,199
6	2	4:34	Polar Air Cargo	PAC716	B744	336	37	227	599	672	73	454	1,199
6	4	5:46	Polar Air Cargo	PAC716	B744	336	37	227	599	672	73	454	1,199
4	12	3:45	Southern Air, Inc.	SOO097	B77L	179	31	227	436	357	61	454	872
						$ 4,539	$ 563	$ 3,629	$ 8,730	$ 9,077	$ 1,126	$ 7,258	$ 17,461

*LAWA Part 161 Application, Section 7, Page 99 - Estimates of APU Fuel Consumption are based on Airport Cooperative Research Program (ACRP) Report 64 "Handbook for Evaluating Emissions and Costs of APUs and Alternative Systems"

**LAWA Part 161 Application, Section 7, Page 88 - Footnote 56 states that 5 cents per kilogram is a typical cargo handling cost.

Scenario 3 – Cargo Carriers

Under Scenario 3, the costs of offloading cargo-only flights do not approach the cost of paying a fine. The FAA has determined that the cost of performing a non-conforming departure for the 16 cargo departures in 2013 is below the threshold of $2,500 per departure, and thus cargo carriers would most likely choose to offload weight to become a conforming departure.

Passenger Carrier Cost Estimates

Scenario 1-Passenger Carriers

The cost of delay for the passenger carrier group includes the operator costs for a crew that is delayed due to offloading, APU fuel consumption during the delay, and compensation paid to 10 passengers who were involuntarily denied boarding. The APU fuel costs are estimated by LAWA, but LAWA does not include them in its estimate of operator costs because ground power is available at some LAX gates.

To determine the total cost for Scenario 1, the passenger value of time is added to the operator costs. In its analysis, LAWA assumes that elimination of an eastbound departure would result in a 3 minute savings of flight time. If true, this would result in a savings of time for those on board. However, as stated above, FAA believes the offloading times assumed in the LAWA study are optimistic and actual unloading times would likely more than offset the flight savings. The crew cost is based on the equipment type used for each of the non-conforming departures in 2013. Cost data by equipment type is available for select U.S. flag carriers. However, most of the 2013 non-conforming passenger departures identified in this analysis were performed by foreign carriers, thus U.S. Flag carrier crew costs per block hour for similar equipment types are used as a proxy. **Table 6** below shows the crew cost in increments of 10 and 20 minutes by equipment type. The APU fuel costs are not accounted for in LAWA's analysis but are part of the FAA analysis. The FAA includes the APU costs as part of its analysis of the costs incurred due to offloading freight and bags. Operator costs for compensation paid to passengers who are denied boarding equal $13,000 per departure.

TABLE 6
Crew Cost Due to Delay
by Equipment Type
Passenger Carriers
CY 2013

	Airplane Crew Cost		
		Scenario 1	Scenario 2
Equipment Type	Per Block Hr.	10 Minutes	20 Minutes
737-800	$ 745	$ 124	$248
747-400	1,642	274	547
767-300	1,014	169	338
777-200	1,314	219	438
777-300	1,072	179	357
777-300ER	1,072	179	357
A380	1,610	268	537

Source: ESG Aviation Services.

Added to the operator's cost for the period of delay is the value of time for the passengers remaining on board. In the cargo and passenger airplane case, the value of lost time incurred by the crew is captured in their wage rate. The passenger cost of delay is based on guidance from the U.S. Department of Transportation for Valuation of Travel Time in Economic Analysis.[68] Using the all-purpose travel category from this guidance, the delay cost per person for a 10-minute delay is estimated to be $7.37 in 2013$ [$44.22 per hour * (10 minutes ÷ 60 minutes)].[69] The passenger value of time for all affected passengers totals $77,039 ($7.37 * 10,453 passengers).

Contrary to the conclusions of LAWA, FAA estimates that the total cost of Scenario 1 is $580,684. This is the sum of the operator costs incurred ($9,645 crew and fuel costs) plus $494,000 denied boarding compensation and the passenger value of time for all affected passengers remaining on board ($77,039). **Table 7** shows the estimated Scenario 1 costs for each of the 38 non-conforming passenger departures in 2013.

[68] U.S. Department of Transportation Memo dated July 9, 2014 "Guidance for Valuation of Travel Time in Economic Analysis" page 5, Table 4.
[69] Ibid. Page 5, Table 4. The all-purpose value of time equals $43.70 in 2012$. DOT Guidance states values should be augmented by 1.2 percent annually prior to discounting to present value.

TABLE 7

FAA Analysis: Annual Operator and Passenger Costs Not Accounted For in LAWA Part 161 Study

CY 2013 Nonconforming Passenger Departures

Scenario 1 - Delay Departure by 10 Minutes to Offload 10,000 Pounds

Including 10 Involuntarily Denied Boarding Passengers

						(1)	(2)	(3)	(4)=(1)+(2)+(3)	(5)	(6)=(4)+(5)
Mo.	Day	Time of NCD	Operator	Equip	Pax*	Crew Cost (10 min)	APU Cost (10 min)	Involuntary Denied Boarding Compensa-tion to 10 Passengers	Scenario 1: Carrier Cost	Value of PaxTime (10 min)	Scenario 1: Total Cost
1	13	1:15	Aeromexico	B737	137	$ 124	$ 16	$ 13,000	$ 13,140	$ 938	$ 14,078
1	13	1:00	Air China	B773	256	$ 179	$ 31	$ 13,000	$ 13,209	$ 1,810	$ 15,019
1	31	1:14	Air China	B773	256	$ 179	$ 31	$ 13,000	$ 13,209	$ 1,810	$ 15,019
4	7	1:44	Air China	B77W	242	$ 179	$ 31	$ 13,000	$ 13,209	$ 1,709	$ 14,918
4	10	2:00	Air China	B77W	242	$ 179	$ 31	$ 13,000	$ 13,209	$ 1,709	$ 14,918
10	7	1:46	Air China	B77W	255	$ 179	$ 31	$ 13,000	$ 13,209	$ 1,809	$ 15,018
1	13	1:17	Alaska Airlines	B738	142	$ 124	$ 16	$ 13,000	$ 13,140	$ 969	$ 14,109
1	13	0:57	All Nippon Airways	B772	194	$ 219	$ 31	$ 13,000	$ 13,250	$ 1,354	$ 14,603
11	23	1:32	All Nippon Airways	B772	208	$ 219	$ 31	$ 13,000	$ 13,250	$ 1,457	$ 14,707
12	21	0:44	All Nippon Airways	B772	197	$ 219	$ 31	$ 13,000	$ 13,250	$ 1,380	$ 14,629
4	10	0:49	Asiana Airlines	B772	271	$ 219	$ 31	$ 13,000	$ 13,250	$ 1,923	$ 15,172
6	2	0:50	Asiana Airlines	B772	284	$ 219	$ 31	$ 13,000	$ 13,250	$ 2,021	$ 15,270
12	28	1:06	Asiana Airlines	B772	269	$ 219	$ 31	$ 13,000	$ 13,250	$ 1,911	$ 15,161
6	2	1:23	Cathay Pacific Airways Ltd.	B77W	271	$ 179	$ 31	$ 13,000	$ 13,209	$ 1,921	$ 15,131
11	21	0:38	Cathay Pacific Airways Ltd.	B77W	253	$ 179	$ 31	$ 13,000	$ 13,209	$ 1,795	$ 15,004
4	10	1:49	China Airlines	B744	280	$ 274	$ 37	$ 13,000	$ 13,310	$ 1,992	$ 15,302

						(1)	(2)	(3)	(4)=(1)+(2)+(3)	(5)	(6)=(4)+(5)
Mo.	Day	Time of NCD	Operator	Equip	Pax*	Crew Cost (10 min)	APU Cost (10 min)	Involuntary Denied Boarding Compensa-tion to 10 Passengers	Scenario 1: Carrier Cost	Value of PaxTime (10 min)	Scenario 1: Total Cost
6	2	1:32	China Airlines	B744	328	$ 274	$ 37	$ 13,000	$ 13,310	$ 2,344	$ 15,654
10	1	1:43	China Airlines	B744	309	$ 274	$ 37	$ 13,000	$ 13,310	$ 2,201	$ 15,512
2	21	0:57	Delta	B763	210	$ 169	$ 16	$ 13,000	$ 13,185	$ 1,478	$ 14,663
4	7	0:36	EVA Airways	B77W	269	$ 179	$ 31	$ 13,000	$ 13,209	$ 1,910	$ 15,119
5	29	2:39	EVA Airways	B77W	296	$ 179	$ 31	$ 13,000	$ 13,209	$ 2,111	$ 15,321
1	19	1:07	Qantas Airways Ltd	B744	408	$ 274	$ 37	$ 13,000	$ 13,310	$ 2,933	$ 16,244
1	19	2:21	Qantas Airways Ltd	B744	371	$ 274	$ 37	$ 13,000	$ 13,310	$ 2,661	$ 15,971
1	25	0:17	Qantas Airways Ltd	B744	302	$ 274	$ 37	$ 13,000	$ 13,310	$ 2,152	$ 15,462
1	28	0:14	Qantas Airways Ltd	B744	342	$ 274	$ 37	$ 13,000	$ 13,310	$ 2,447	$ 15,757
5	29	3:30	Qantas Airways Ltd	B744	321	$ 274	$ 37	$ 13,000	$ 13,310	$ 2,292	$ 15,603
6	2	0:47	Qantas Airways Ltd	B744	338	$ 274	$ 37	$ 13,000	$ 13,310	$ 2,417	$ 15,728
7	11	3:33	Qantas Airways Ltd	B744	342	$ 274	$ 37	$ 13,000	$ 13,310	$ 2,447	$ 15,757
9	18	1:03	Qantas Airways Ltd	B744	310	$ 274	$ 37	$ 13,000	$ 13,310	$ 2,211	$ 15,521
10	1	0:45	Qantas Airways Ltd	B744	352	$ 274	$ 37	$ 13,000	$ 13,310	$ 2,521	$ 15,831
10	2	0:27	Qantas Airways Ltd	B744	370	$ 274	$ 37	$ 13,000	$ 13,310	$ 2,653	$ 15,964
11	7	0:02	Qantas Airways Ltd	A388	429	$ 268	$ 37	$ 13,000	$ 13,305	$ 3,088	$ 16,393
11	21	0:19	Qantas Airways Ltd	B744	327	$ 274	$ 37	$ 13,000	$ 13,310	$ 2,336	$ 15,647
12	6	0:33	Qantas Airways Ltd	B744	293	$ 274	$ 37	$ 13,000	$ 13,310	$ 2,086	$ 15,396
1	13	1:30	Virgin Australia	B77W	326	$ 179	$ 31	$ 13,000	$ 13,209	$ 2,326	$ 15,536
10	2	0:35	Virgin Australia	B77W	308	$ 179	$ 31	$ 13,000	$ 13,209	$ 2,195	$ 15,404

						(1)	(2)	(3)	(4)=(1)+(2)+(3)	(5)	(6)=(4)+(5)
Mo.	Day	Time of NCD	Operator	Equip	Pax*	Crew Cost (10 min)	APU Cost (10 min)	Involuntary Denied Boarding Compensa-tion to 10 Passengers	Scenario 1: Carrier Cost	Value of PaxTime (10 min)	Scenario 1: Total Cost
1	13	1:30	Virgin Australia	B77W	326	$ 179	$ 31	$ 13,000	$ 13,209	$ 2,326	$ 15,536
10	2	0:35	Virgin Australia	B77W	308	$ 179	$ 31	$ 13,000	$ 13,209	$ 2,195	$ 15,404
11	4	0:44	Virgin Australia	B77W	256	$ 179	$ 31	$ 13,000	$ 13,209	$ 1,814	$ 15,023
12	16	0:21	Virgin Australia	B77W	269	$ 179	$ 31	$ 13,000	$ 13,209	$ 1,910	$ 15,119
					10,833	$ 8,428	$ 1,217	$ 494,000	$ 503,645	$ 77,039	$ 580,684

*U.S. DOT BTS data is used for all carriers (monthly average by equipment type) with the exception of Quantas Airways, Ltd., which provided to the FAA total passengers (revenue and nonrevenue) for each of its CY 2013 NCDs.

Note: Details may not add due to rounding.

Prepared by: FAA

The FAA's estimate for the total number of hours of passenger delay for offloading weight and the concomitant cost would be higher if the FAA had used LAWA's forecasted number of non-conforming departures. LAWA estimates that 13,331 passengers on 52 non-conforming passenger departures are delayed annually. In comparison, the FAA estimates are based on 38 non-conforming passenger carrier departures carrying 10,453 passengers.

TABLE 8
Hours of Passenger Delay
LAWA Part 161 Study vs. FAA Analysis
Scenario 1: 10-minute delay

Entity	Nonconforming Departures	Total Passengers	Delay	
			Minutes	Hours
LAWA	52	13,331	133,310	2,222
FAA	38	10,453	104,530	1,742
Variance	14	2,878	28,780	480

Prepared by: FAA

FAA's Scenario 1 estimated costs differ from those estimated by LAWA because LAWA assumes that only freight and/or passenger bags are offloaded. In addition, the FAA assumes the passengers would be involuntarily denied boarding.

Based on IATA comments that it could take several days to accommodate displaced passengers, the FAA looked at the load factors and time between departures for the 35 non-conforming passenger flights departing for the Pacific region. These times ranged from 11 to 24 hours for departures to Asia, and from 24 and 48 hours for departures to Australia, thus making it plausible that a passenger could be stranded for a day or more. Furthermore, on average, departures to the Pacific region have high load factors. For the 38 non-conforming passenger flights in 2013, the average load factor is estimated to be 87.4 percent.[70] **Table 9** below shows the hours between departures for all non-conforming passenger departures that occurred in 2013.

[70] Carrier filings to the U.S. DOT on Form 41. Load factors are calculated by dividing revenue passengers by seats. Load factors are likely much higher since T100 passengers do not include nonrevenue passengers, such as frequent flyer passengers and off-duty crew.

TABLE 9
Hours Until Next Departure By Carrier and by Arrival City - CY 2013

Carrier	Call Sign	Local Date	Arrival City	Equip-ment Type	Scheduled Block Time (Hrs:Min)*	Statute Miles**	Hours Until Next Departure**
Aeromexico	AMX467	1/13/2013	Guadalajara	B737	3:01	1,310	11.9
Air China	CCA984	1/13/2013	Beijing	B773	12:50	6,244	11.2
Air China	CCA984	1/31/2013	Beijing	B773	12:50	6,244	11.2
Air China	CCA984	4/7/2013	Beijing	B77W	12:40	6,244	11.7
Air China	CCA984	4/10/2013	Beijing	B77W	12:40	6,244	11.7
Air China	CCA984	10/7/2013	Beijing	B77W	12:40	6,244	11.7
Alaska Airlines	ASA256	1/13/2013	Mexico City	B738	3:00	1,555	9.3
All Nippon Airways	ANA1005	1/13/2013	Tokyo Intl	B772	12:05	5,482	24.0
All Nippon Airways	ANA1005	11/23/2013	Tokyo	B772	12:05	5,482	24.0
All Nippon Airways	ANA1005	12/21/2013	Tokyo	B772	12:05	5,482	24.0
Asiana Airlines	AAR203	4/10/2013	Seoul	B772	13:00	5,993	12.2
Asiana Airlines	AAR203	6/2/2013	Seoul	B772	13:00	5,993	12.2
Asiana Airlines	AAR203	12/28/2013	Seoul	B772	13:20	5,993	11.3
Cathay Pacific	CPA881	6/2/2013	Honk Kong	B77W	14:45	7,255	11.7
Cathay Pacific	CPA881	11/21/2013	Hong Kong	B77W	15:35	7,255	11.3
China Air Lines	CAL007	4/10/2013	Taoyuan Taiwan	B744	14:29	6,780	14.9
China Air Lines	CAL007	6/2/2013	Taoyuan Taiwan	B744	13:11	6,780	14.9
China Air LInes	CAL007	10/1/2013	Taoyuan Taiwan	B744	13:55	6,780	14.9
Delta Air Lines	DAL2268	2/21/2013	Minneapolis	B763	3:42	1,535	6.2
EVA Airways	EVA15	4/7/2013	Taoyuan Taiwan	B77W	13:25	6,780	24.0
EVA Airways	EVA15	5/29/2013	Taoyuan Taiwan	B77W	13:25	6,780	15.7
Qantas Airways LTD	QFA16	1/19/2013	Brisbane	B744	14:05	7,177	24.0
Qantas Airways LTD	QFA108	1/19/2013	Sydney	B744	14:50	7,502	22.7
Qantas Airways LTD	QFA16	1/25/2013	Brisbane	B744	14:05	7,177	24.0
Qantas Airways LTD	QFA16	1/28/2013	Brisbane	B744	14:05	7,177	24.0
Qantas Airways LTD	QFA108	5/29/2013	Sydney	B744	14:50	7,502	22.3
Qantas Airways LTD	QFA108	6/2/2013	Sydney	B744	14:50	7,502	22.3
Qantas Airways LTD	QFA108	7/11/2013	Sydney	B744	14:50	7,502	22.3
Qantas Airways LTD	QFA16	9/18/2013	Brisbane	B744	14:00	7,177	24.0
Qantas Airways LTD	QFA108	10/1/2013	Sydney	B744	14:45	7,502	22.3
Qantas Airways LTD	QFA108	10/2/2013	Sydney	B744	14:45	7,502	22.3
Qantas Airways LTD	QFA94	11/7/2013	Melbourne	A388	15:50	7,936	24.0
Qantas Airways LTD	QFA16	11/21/2013	Brisbane	B744	14:00	7,177	24.0
Qantas Airways LTD	QFA108	12/6/2013	Sydney	B744	14:45	7,502	22.4
Virgin Australia	VOZ8	1/13/2013	Brisbane	B77W	14:05	7,177	48.0
Virgin Australia	VOZ24	10/2/2013	Melbourne	B77W	15:50	7,936	48.0
Virgin Australia	VOZ24	11/4/2013	Melbourne	B77W	15:45	7,936	48.0
Virgin Australia	VOZ24	12/16/2013	Melbourne	B77W	15:45	7,936	48.0

*FAA Aviation System Performance Metrics - Individual Flight Record

** FAA Flight Schedule Data System (FSDS)

Prepared by: FAA

Scenario 2 – Passenger Carriers

In scenario 2, LAWA's analysis assumes that a carrier is delayed 20 minutes for the purpose of offloading 20,000 pounds. The 20,000 pounds offloaded includes the 10,000 pounds offloaded in Scenario 1 plus an additional 10,000 pounds, consisting of 44 passengers who voluntarily give up their seats for compensation and a later departure along with their bags.

As discussed in Scenario 1, LAWA assumes in its analysis that elimination of an eastbound departure would result in a 3 minute savings of flight time. If true, this would result in a savings of time for those on board. However, FAA believes the offloading times assumed in the LAWA study are optimistic and actual unloading times would likely offset the flight savings. The calculation of the airplane crew cost for the 20-minute delay is the same used for FAA Scenario 1, except the minutes of delay are doubled from 10 minutes to 20. For the 38 passenger carriers, this annual cost totals $16,843. The APU cost estimated in FAA Scenario 1 is doubled as well, for an annual total of $2,434.

The FAA assumes that an average of 10 passengers would be denied boarding to achieve the first 10,000 pounds of weight reduction in addition to the 44 passengers assumed by LAWA.[71] The compensation to passengers that are involuntarily denied boarding is tiered based on the arrival delay in hours, with a maximum passenger compensation of $1,300 for arrival delays beyond four hours. Flight schedules show that each passenger denied boarding on the 38 non-conforming passenger departures would have experienced an arrival delay beyond four hours, thus requiring mandatory compensation by carriers to each such passenger, for a total cost to carriers of approximately $2.7 million on an annual basis (54 passengers per departure * $1,300 compensation per passenger * 38 affected departures).

For the passengers that remain on board and continue to their destination, the value of passenger time for 20 minutes is calculated. This cost is $14.74 per passenger ($7.37 for 10-minute delay * 2 = $14.74), for a total annual cost of approximately $130,000 ($14.74 * 8,781 passengers). **Table 10** below shows the costs estimated for Scenario 2, by carrier, for each of the 38 non-conforming passenger departures that occurred in 2013.

[71] See discussion of Scenario 1.

TABLE 10

FAA Analysis: Annual Operator and Passenger Costs Not Accounted for In LAWA Part 161 Study

CY 2013 Nonconforming Passenger Departures

Scenario 2 - Delay Departure by 20 Minutes to Offload 20,000 Pounds

Including 54 Involuntarily Denied Boarding Passengers

					(1)	(2)	(3)	(4) = (1)+(2)+(3)	(5)	(6) = (4)+(5)
Mo.	Day	Operator	Flight #	Pax*	Crew Cost (20 Min)	APU Cost (20 Min)	Involuntary Denied Boarding Compensation to 54 Passengers	Scenario 2: Carrier Cost	Value of Time for Passengers Remaining on Board	Scenario 2: Total Cost
1	13	Aeromexico	AMX467	137	$ 248	$ 32	$ 70,200	$ 70,480	$ 1,228	$ 71,708
1	13	Air China	CCA984	256	$ 357	$ 61	$ 70,200	$ 70,619	$ 2,971	$ 73,590
1	31	Air China	CCA984	256	$ 357	$ 61	$ 70,200	$ 70,619	$ 2,971	$ 73,590
4	7	Air China	CCA984	242	$ 357	$ 61	$ 70,200	$ 70,619	$ 2,770	$ 73,388
4	10	Air China	CCA984	242	$ 357	$ 61	$ 70,200	$ 70,619	$ 2,770	$ 73,388
10	7	Air China	CCA984	255	$ 357	$ 61	$ 70,200	$ 70,619	$ 2,970	$ 73,588
1	13	Alaska Airlines	ASA256	142	$ 248	$ 32	$ 70,200	$ 70,480	$ 1,290	$ 71,770
1	13	All Nippon Airways	ANA1005	194	$ 438	$ 61	$ 70,200	$ 70,699	$ 2,059	$ 72,758
11	23	All Nippon Airways	ANA1005	208	$ 438	$ 61	$ 70,200	$ 70,699	$ 2,266	$ 72,965
12	21	All Nippon Airways	ANA1005	197	$ 438	$ 61	$ 70,200	$ 70,699	$ 2,111	$ 72,810
4	10	Asiana Airlines	AAR203	271	$ 438	$ 61	$ 70,200	$ 70,699	$ 3,197	$ 73,896
6	2	Asiana Airlines	AAR203	284	$ 438	$ 61	$ 70,200	$ 70,699	$ 3,393	$ 74,092
12	28	Asiana Airlines	AAR203	269	$ 438	$ 61	$ 70,200	$ 70,699	$ 3,173	$ 73,873
6	2	Cathay Pacific Airwa	CPA881	271	$ 357	$ 61	$ 70,200	$ 70,619	$ 3,194	$ 73,812
11	21	Cathay Pacific Airwa	CPA881	253	$ 357	$ 61	$ 70,200	$ 70,619	$ 2,941	$ 73,559

Table 10 (continued)

					(1)	(2)	(3)	(4) = (1)+(2)+(3)	(5)	(6) = (4)+(5)
Mo.	Day	Operator	Flight #	Pax*	Crew Cost (20 Min)	APU Cost (20 Min)	Involuntary Denied Boarding Compensa-tion to 54 Passengers	Scenario 2: Carrier Cost	Value of Time for Passengers Remaining on Board	Scenario 2: Total Cost
4	10	China Airlines	CAL007	280	$ 547	$ 73	$ 70,200	$ 70,821	$ 3,335	$ 74,156
6	2	China Airlines	CAL007	328	$ 547	$ 73	$ 70,200	$ 70,821	$ 4,040	$ 74,860
10	1	China Airlines	CAL007	309	$ 547	$ 73	$ 70,200	$ 70,821	$ 3,754	$ 74,575
2	21	Delta	DAL2268	210	$ 338	$ 32	$ 70,200	$ 70,570	$ 2,307	$ 72,877
4	7	EVA Airways	EVA15	269	$ 357	$ 61	$ 70,200	$ 70,619	$ 3,171	$ 73,790
5	29	EVA Airways	EVA15	296	$ 357	$ 61	$ 70,200	$ 70,619	$ 3,574	$ 74,193
1	19	Qantas Airways Ltd	QFA16	408	$ 547	$ 73	$ 70,200	$ 70,821	$ 5,218	$ 76,039
1	19	Qantas Airways Ltd	QFA108	371	$ 547	$ 73	$ 70,200	$ 70,821	$ 4,673	$ 75,493
1	25	Qantas Airways Ltd	QFA16	302	$ 547	$ 73	$ 70,200	$ 70,821	$ 3,656	$ 74,476
1	28	Qantas Airways Ltd	QFA16	342	$ 547	$ 73	$ 70,200	$ 70,821	$ 4,245	$ 75,066
5	29	Qantas Airways Ltd	QFA108	321	$ 547	$ 73	$ 70,200	$ 70,821	$ 3,936	$ 74,756
6	2	Qantas Airways Ltd	QFA108	338	$ 547	$ 73	$ 70,200	$ 70,821	$ 4,186	$ 75,007
7	11	Qantas Airways Ltd	QFA108	342	$ 547	$ 73	$ 70,200	$ 70,821	$ 4,245	$ 75,066
9	18	Qantas Airways Ltd	QFA16	310	$ 547	$ 73	$ 70,200	$ 70,821	$ 3,773	$ 74,594

Table 10 (continued)

					(1)	(2)	(3)	(4) = (1)+(2)+(3)	(5)	(6) = (4)+(5)
Mo.	Day	Operator	Flight #	Pax*	Crew Cost (20 Min)	APU Cost (20 Min)	Involuntary Denied Boarding Compensa-tion to 54 Passengers	Scenario 2: Carrier Cost	Value of Time for Passengers Remaining on Board	Scenario 2: Total Cost
10	1	Qantas Airways Ltd	QFA108	352	$ 547	$ 73	$ 70,200	$ 70,821	$ 4,393	$ 75,213
10	2	Qantas Airways Ltd	QFA108	370	$ 537	$ 73	$ 70,200	$ 70,810	$ 4,658	$ 75,468
11	7	Qantas Airways Ltd	QFA94	429	$ 537	$ 73	$ 70,200	$ 70,810	$ 5,528	$ 76,338
11	21	Qantas Airways Ltd	QFA16	327	$ 547	$ 73	$ 70,200	$ 70,821	$ 4,024	$ 74,845
12	6	Qantas Airways Ltd	QFA108	293	$ 547	$ 73	$ 70,200	$ 70,821	$ 3,523	$ 74,344
1	13	Virgin Australia	VOZ8	326	$ 357	$ 61	$ 70,200	$ 70,619	$ 4,004	$ 74,623
10	2	Virgin Australia	VOZ24	308	$ 357	$ 61	$ 70,200	$ 70,619	$ 3,742	$ 74,360
11	4	Virgin Australia	VOZ24	256	$ 357	$ 61	$ 70,200	$ 70,619	$ 2,979	$ 73,597
12	16	Virgin Australia	VOZ24	269	$ 357	$ 61	$ 70,200	$ 70,619	$ 3,171	$ 73,790
				10,833	$ 16,843	$ 2,434	$ 2,667,600	$ 2,686,877	$ 129,433	$ 2,816,310

*U.S. DOT BTS data is used for all carriers (monthly average by equipment type) with the exception of Qantas Airways Ltd., which provided total passengers (revenue and nonrevenue) to the FAA for each of its CY 2013 NCDs.

Note: Details may not add due to rounding.

Prepared by: FAA

As shown in **Table 10**, based on the 38 non-conforming departures in 2013, the FAA calculates an annual cost (operator costs plus onboard passenger value of time) for Scenario 2 to be just over $2.8 million consisting of approximately $2.7 million in carrier costs plus the value of passenger time at approximately $130,000.

In summary, the FAA finds that LAWA's analysis understates the compensation paid by carriers to passengers that are offloaded. LAWA assumes that 44 passengers ***voluntarily*** give up their seats. For those passengers departing to Asia, LAWA estimates the compensation to be $500, and for passengers departing to Australia and Fiji, the compensation is estimated to be $800. The FAA Scenario 2 assumes that the 54 passengers are ***involuntarily*** denied boarding, requiring the carrier to pay each passenger the maximum compensation allowed by the DOT, which is $1,300. If FAA used LAWA's average of 65 non-conforming flights, 52 of which are passenger carriers, operators would have been required to compensate passengers an additional $1.9 million annually, as shown in **Table 11**.

TABLE 11
LAWA Part 161 Study Understatement of Passenger Compensation Costs on an Annual Basis Based on 52 Departures
Using the FAA Assumption that 54 Passengers are Involuntarily Denied Boarding
In 2013$

Arrival City	Passengers Offloaded	Compensation Per Passenger ($)		Compensation Per Departure ($)		Departures (LAWA Analysis)	Compensation for 52 Nonconforming Departures		LAWA Understatement of Pax Compensation ($)
		LAWA - Voluntarily Denied Boarding	FAA - Involuntarily Denied Boarding	LAWA	FAA		LAWA Compensation	FAA Compensation	
Beijing	54	500	1,300	27,000	70,200	2	$ 54,000	$ 140,400	$ (86,400)
Brisbane	54	800	1,300	43,200	70,200	9	388,800	631,800	(243,000)
Guangzhou	54	500	1,300	27,000	70,200	3	81,000	210,600	(129,600)
Hong Kong	54	500	1,300	27,000	70,200	3	81,000	210,600	(129,600)
Incheon	54	500	1,300	27,000	70,200	9	243,000	631,800	(388,800)
Melbourne	54	800	1,300	43,200	70,200	2	86,400	140,400	(54,000)
Nadi, Fiji	54	800	1,300	43,200	70,200	1	43,200	70,200	(27,000)
Sydney	54	800	1,300	43,200	70,200	9	388,800	631,800	(243,000)
Taipei	54	500	1,300	27,000	70,200	9	243,000	631,800	(388,800)
Tokyo	54	500	1,300	27,000	70,200	5	135,000	351,000	(216,000)
Total						52	$ 1,744,200	$ 3,650,400	$ (1,906,200)

*The FAA estimated the understatement of costs based on the 52 nonconforming departures identified in the LAWA Part 161 Study

**The LAWA Part 161 Study assumption that passengers voluntarily give up their seat for compensation diverges from the FAA assumption that assumes passengers are involuntarily denied boarding.

Prepared by: FAA

Scenario 3 – Passenger Carriers

LAWA's proposed restriction would impose a fine on operators that fly a non-conforming flight. The fine ranges between $2,500 and $10,000, depending on the number of non-conforming flights the carrier performs over a specified time period.

Scenario 3 analyzes the fine for performing a non-conforming flight on a departure-by-departure basis against the operator costs estimated in Scenario 1 and Scenario 2. It is assumed that an operator will choose the lesser of a fine or the cost of denied boarding compensation, crew delay, and APU fuel burn. When a fine is paid, the flight is non-conforming. If the operator chooses to pay the fine to perform an easterly departure, the passenger value of time is eliminated as a cost of the proposed restriction.

Scenario 3 vs. Scenario 1 (Pay Fine vs. 10-Minute Delay)

In this scenario the operator chooses to incur the lesser of the cost for a 10-minute delay (which includes the compensation paid to passengers involuntarily denied boarding) or the fine for performing a non-conforming departure. Given these two options, the carrier would opt to pay the

fine for each of the 38 non-conforming passenger departures that occurred in 2013. This is because the involuntary denied boarding compensation of $13,000 per departure (10 passengers * $1,300 compensation), *alone* is higher than paying a fine of $2,500 for a carrier's first violation, $5,000 for a second violation, and the maximum fine of $10,000 for any violation beyond the second. The total operators' cost of this scenario consists entirely of fines paid to the LAWA Airport Revenue Fund and totals $257,500. Since carriers opt for the fine, passengers do not experience delay, and thus the value of passenger time is eliminated as a cost, as shown in **Table 12**. The results for Scenario 3 based on a delay of 10 minutes and 20 minutes follow.

TABLE 12
Hours of Passenger Delay
LAWA Part 161 Study vs. FAA Analysis
Scenario 1: 10-minute delay

Entity	Nonconforming Departures	Total Passengers	Delay	
			Minutes	Hours
LAWA	52	13,331	133,310	2,222
FAA	38	10,833	0	0
Variance	14	2,498	133,310	2,222

Prepared by: FAA

Scenario 3 vs. Scenario 2 (Pay Fine vs. 20-Minute Delay)

In this scenario the operator chooses to incur the lesser of the cost for a 20-minute delay (which includes the compensation paid to passengers involuntarily denied boarding) or the fine for performing a non-conforming departure. Given these two options, the carrier would opt to pay the fine for each of the 38 non-conforming passenger departures that occurred in 2013. This is because the involuntary denied boarding compensation of $70,200 per departure (54 passengers * $1,300 compensation), *alone* is 28 times higher than paying a fine of $2,500 for a carrier's first violation, 14 times higher than the fine for a second violation, and 7 times greater than the maximum fine of $10,000 for any violation beyond the second. The total operators' cost of this scenario consists entirely of fines paid to the LAWA Airport Revenue Fund and totals $257,500. Since carriers opt for the fine, passengers do not experience delay, and thus the value of passenger time is eliminated as a cost. The results for Scenario 3 based on a delay of 10 minutes and 20 minutes follow.

TABLE 13
Calendar Year 2013
Carrier Cost: Lesser of Fine or Cost of Departure Delay
(Scenario 1 vs. Scenario 3)
(Scenario 2 vs. Scenario 3)

					(1)	(2)	(3) = (1) if <(2),(2)	(4)	(5)=(1) if < (4), (4)
Mo.	Day	Operator	Flight #	Pax*	LAWA Civil Penlaty	**Scenario 1**: Cost for Crew and APU Due to 10-Minute Delay Plus IDB Compensation	**Scenario 3: Decision: Lesser of Operator Cost Based on Scenario 1 or LAWA Penalty**	**Scenario 2**: Cost for Crew and APU Due to 20-Minute Delay Plus IDB Compensation	**Scenario 3: Decision: Lesser of Operator Cost Based on Scenario 2 or LAWA Penalty**
1	13	Aeromexico	AMX467	137	$ 2,500	$ 13,140	$ 2,500	$ 70,480	$ 2,500
1	13	Air China	CCA984	256	$ 2,500	$ 13,209	$ 2,500	$ 70,619	$ 2,500
1	31	Air China	CCA984	256	$ 5,000	$ 13,209	$ 5,000	$ 70,619	$ 5,000
4	7	Air China	CCA984	242	$ 10,000	$ 13,209	$ 10,000	$ 70,619	$ 10,000
4	10	Air China	CCA984	242	$ 10,000	$ 13,209	$ 10,000	$ 70,619	$ 10,000
10	7	Air China	CCA984	255	$ 10,000	$ 13,209	$ 10,000	$ 70,619	$ 10,000
1	13	Alaska Airlines	ASA256	142	$ 2,500	$ 13,140	$ 2,500	$ 70,480	$ 2,500
1	13	All Nippon Airways	ANA1005	194	$ 2,500	$ 13,250	$ 2,500	$ 70,699	$ 2,500
11	23	All Nippon Airways	ANA1005	208	$ 5,000	$ 13,250	$ 5,000	$ 70,699	$ 5,000
12	21	All Nippon Airways	ANA1005	197	$ 10,000	$ 13,250	$ 10,000	$ 70,699	$ 10,000
4	10	Asiana Airlines	AAR203	271	$ 2,500	$ 13,250	$ 2,500	$ 70,699	$ 2,500
6	2	Asiana Airlines	AAR203	284	$ 5,000	$ 13,250	$ 5,000	$ 70,699	$ 5,000
12	28	Asiana Airlines	AAR203	269	$ 10,000	$ 13,250	$ 10,000	$ 70,699	$ 10,000

Table 13 (continued)

					(1)	(2)	(3) = (1) if <(2),(2)	(4)	(5)=(1) if < (4), (4)
Mo.	Day	Operator	Flight #	Pax*	LAWA Civil Penlaty	**Scenario 1**: Cost for Crew and APU Due to 10-Minute Delay Plus IDB Compensation	**Scenario 3: Decision: Lesser of Operator Cost Based on Scenario 1 or LAWA Penalty**	**Scenario 2**: Cost for Crew and APU Due to 20-Minute Delay Plus IDB Compensation	**Scenario 3: Decision: Lesser of Operator Cost Based on Scenario 2 or LAWA Penalty**
6	2	Cathay Pacific Airwa	CPA881	271	$ 2,500	$ 13,209	$ 2,500	$ 70,619	$ 2,500
11	21	Cathay Pacific Airwa	CPA881	253	$ 5,000	$ 13,209	$ 5,000	$ 70,619	$ 5,000
4	10	China Airlines	CAL007	280	$ 2,500	$ 13,310	$ 2,500	$ 70,821	$ 2,500
6	2	China Airlines	CAL007	328	$ 5,000	$ 13,310	$ 5,000	$ 70,821	$ 5,000
10	1	China Airlines	CAL007	309	$ 10,000	$ 13,310	$ 10,000	$ 70,821	$ 10,000
2	21	Delta	DAL2268	210	$ 2,500	$ 13,185	$ 2,500	$ 70,570	$ 2,500
4	7	EVA Airways	EVA15	269	$ 2,500	$ 13,209	$ 2,500	$ 70,619	$ 2,500
5	29	EVA Airways	EVA15	296	$ 5,000	$ 13,209	$ 5,000	$ 70,619	$ 5,000
1	19	Qantas Airways Ltd	QFA16	408	$ 2,500	$ 13,310	$ 2,500	$ 70,821	$ 2,500
1	19	Qantas Airways Ltd	QFA108	371	$ 5,000	$ 13,310	$ 5,000	$ 70,821	$ 5,000
1	25	Qantas Airways Ltd	QFA16	302	$ 10,000	$ 13,310	$ 10,000	$ 70,821	$ 10,000
1	28	Qantas Airways Ltd	QFA16	342	$ 10,000	$ 13,310	$ 10,000	$ 70,821	$ 10,000
5	29	Qantas Airways Ltd	QFA108	321	$ 10,000	$ 13,310	$ 10,000	$ 70,821	$ 10,000
6	2	Qantas Airways Ltd	QFA108	338	$ 10,000	$ 13,310	$ 10,000	$ 70,821	$ 10,000
7	11	Qantas Airways Ltd	QFA108	342	$ 10,000	$ 13,310	$ 10,000	$ 70,821	$ 10,000
9	18	Qantas Airways Ltd	QFA16	310	$ 10,000	$ 13,310	$ 10,000	$ 70,821	$ 10,000

Table 13 (continued)

					(1)	(2)	(3) = (1) if <(2),(2)	(4)	(5)=(1) if < (4), (4)
Mo.	Day	Operator	Flight #	Pax*	LAWA Civil Penlaty	**Scenario 1**: Cost for Crew and APU Due to 10-Minute Delay Plus IDB Compensation	**Scenario 3: Decision: Lesser of Operator Cost Based on Scenario 1 or LAWA Penalty**	**Scenario 2**: Cost for Crew and APU Due to 20-Minute Delay Plus IDB Compensation	**Scenario 3: Decision: Lesser of Operator Cost Based on Scenario 2 or LAWA Penalty**
10	1	Qantas Airways Ltd	QFA108	352	$ 10,000	$ 13,310	$ 10,000	$ 70,821	$ 10,000
10	2	Qantas Airways Ltd	QFA108	370	$ 10,000	$ 13,310	$ 10,000	$ 70,810	$ 10,000
11	7	Qantas Airways Ltd	QFA94	429	$ 10,000	$ 13,305	$ 10,000	$ 70,810	$ 10,000
11	21	Qantas Airways Ltd	QFA16	327	$ 10,000	$ 13,310	$ 10,000	$ 70,821	$ 10,000
12	6	Qantas Airways Ltd	QFA108	293	$ 10,000	$ 13,310	$ 10,000	$ 70,821	$ 10,000
1	13	Virgin Australia	VOZ8	326	$ 2,500	$ 13,209	$ 2,500	$ 70,619	$ 2,500
10	2	Virgin Australia	VOZ24	308	$ 5,000	$ 13,209	$ 5,000	$ 70,619	$ 5,000
11	4	Virgin Australia	VOZ24	256	$ 10,000	$ 13,209	$ 10,000	$ 70,619	$ 10,000
12	16	Virgin Australia	VOZ24	269	$ 10,000	$ 13,209	$ 10,000	$ 70,619	$ 10,000
				10,833	$ 257,500	$ 503,645	$ 257,500	$ 2,686,877	$ 257,500
					Revenues Collected by LAWA		***$ 257,500***		***$ 257,500***

*U.S. DOT BTS data is used for all carriers (monthly average for segment by equipment type) with the exception of Qantas Airways Ltd., which provided totalpassengers (revenue and nonrevenue) to the FAA for each of its CY 2013 NCDs.

Prepared by: FAA

LAWA did not evaluate a carrier's choice to pay a fine for performing a non-conforming departure as opposed to incurring the cost of a delay. If payment of the penalty to be able to perform a non-conforming departure had been considered by LAWA in Scenario 2, the results would have been similar to those shown by the FAA. The fines greatly reduce the loss of revenue, loss of boarding costs to the carriers, and the loss of consumer surplus to the passengers, but permit the flight to be non-conforming. Even based on the LAWA's estimate for Scenario 2, the total compensation for offloading 44 passengers would have been just over $1.4 million. As shown in **Table 14**, the annual cost to the carriers for opting to pay a penalty instead would have totaled $342,500, which is substantially below the costs of offloading passengers.

TABLE 14
Fines Collected by LAWA if Carriers Choose to Perform
A Nonconforming Departure in Place of Compensating 44 Passengers

Carrier	Nonconforming Departures	Destination	Passengers Offloaded Per Departure	Carrier Compensation Per Passenger	Compensation Per Departure	Total Passenger Compensation	LAWA Civil Penalty
China Airlines	1	Taipei	44	$500	$22,000	$22,000	$2,500
EVA Airways	8	Taipei	44	$500	$22,000	$176,000	$67,500
Air China	2	Beijing	44	$500	$22,000	$44,000	$7,500
Cathay Pacific	3	Hong Kong	44	$500	$22,000	$66,000	$17,500
Korean Airlines	6	Seoul	44	$500	$22,000	$132,000	$47,500
All Nippon Airways	5	Tokyo	44	$500	$22,000	$110,000	$37,500
Asiana Airlines	3	Seoul	44	$500	$22,000	$66,000	$17,500
China Soutern Airlines	3	Guangzhou	44	$500	$22,000	$66,000	$17,500
Delta Air Lines	2	Sydney	44	$800	$35,200	$70,400	$7,500
Air Pacific	1	Nadi,Fiji	44	$800	$35,200	$35,200	$2,500
Qantas Airways LTD	6	Brisbane	44	$800	$35,200	$211,200	$47,500
Qantas Airways LTD	2	Melbourne	44	$800	$35,200	$70,400	$7,500
Qantas Airways LTD	5	Sydney	44	$800	$35,200	$176,000	$37,500
United Airlines	2	Sydney	44	$800	$35,200	$70,400	$7,500
Virgin Australia International	3	Brisbane	44	$800	$35,200	$105,600	$17,500
Total	52					$1,421,200	$342,500

Prepared by: FAA

Table 15 below shows the maximum number of passengers a carrier should offload until it becomes cost effective for the carrier to pay a fine to depart to the east.

TABLE 15
Maximum Number of Passengers a Carrier Should Compensate for Taking a Later Departure
Until it is Becomes Cost Beneficial to Pay a Fine to LAWA
(By Arrival Region and Number of Violations)

		Maximum Number of Passengers to Compensate Until Payment of Penalty Becomes Cost Beneficial		
Entity	Passenger Compensation	1 Violation $2,500	2 Violations $5,000	>= 3 Violations $10,000
LAWA				
Asia	$500	5	10	20
Australia	$800	3	6	12
FAA				
Asia	$1,300	1	3	7
Australia	$1,300	1	3	7

How to read this table:
1. Using LAWA Part 161 Study compensation assumptions, it is more cost beneficial for a carrier departing to Australia to pay a fine for its first violation versus compensating four passengers to to take a later departure.
1. Using FAA compensation assumptions, it is more cost beneficial for a carrier departing to Australia to pay a fine for its first violation versus compensating two passengers to to take a later departure.

Prepared by: FAA

Conclusion

Under either of LAWA's scenarios, which require the offloading of passengers as well as cargo, the proposed restriction would impose unreasonable costs on carriers. The mandatory $1,300 compensation of passengers due to involuntary denied boarding would reduce the profits of flights, perhaps to the point where the flight becomes unprofitable. The FAA estimates the annual cost of the restriction to be $580,684 under passenger Scenario 1 and just over $2.8 million under passenger Scenario 2. The benefits of the restriction would be small – a 0.2% reduction in population exposed to significant noise and sleep awakenings, as discussed under Condition 1. Thus, even without considering Scenario 3 (discussed below), FAA finds an undue burden.

Based on the FAA analysis, which uses the required compensation of $1,300 per passenger for involuntary denied boarding, it would be less detrimental to a carrier's profits to pay a $2,500 fine to LAWA for its first violation rather than deny boarding to as few as two passengers. Any passenger who is denied boarding on an international flight is likely to incur a personal loss greater than the compensation. As long as the payment of fines is an option, some operators would likely continue to operate non-conforming departures and to pay the fine. Under this scenario, the annual operator costs for passenger flights would be $257,500, and there would be no noise benefits from these flights.

The FAA's analysis reveals that LAWA's evidence fails to demonstrate that the estimated potential benefits of the restriction have a reasonable chance to exceed the estimated potential costs of the adverse effects on interstate and foreign commerce, as required by the regulation. FAA's estimate of the costs of off-loading weight and incurring a delay in order to avoid a non-conforming departure – $589,414 to $2.83 million – would overwhelm the extremely small benefit in noise reduction and would probably make no appreciable impact on the overall noise problem at LAX. If passenger carriers opted to pay the fine, the costs would be lower but there would be even less noise reduction.

As we have noted throughout, in our analysis, all but two of the flights listed in **Table 1** were to foreign destinations. Accordingly, the undue burden we find is particularly focused on foreign commerce.

FAA FINDING: LAWA does not demonstrate by substantial evidence that the runway use restriction at LAX does not create an undue burden on interstate or foreign commerce; therefore, LAWA has not satisfied Condition 2..

Condition 3: "The proposed restriction maintains safe and efficient use of the navigable airspace."[72]

Essential information needed to demonstrate this condition includes evidence that the proposed restriction maintains safe and efficient use of the navigable airspace based upon: (A) Identification of airspace and obstacles to navigation in the vicinity of the airport; and (B) an analysis of the effects of the proposed restriction with respect to use of airspace in the vicinity of the airport, substantiating that the restriction maintains or enhances safe and efficient use of the navigable airspace.[73]

While the FAA does not agree with aspects of LAWA's evidence as discussed below, the FAA believes that safe and efficient use of the navigable airspace would be maintained. Therefore, Condition 3 is satisfied.

Evidence submitted by LAWA in support of Condition 3

LAWA states that "almost no proof should be required" to substantiate that the proposed restriction maintains safe and efficient use of the navigable airspace.[74] LAWA notes that the restriction would not ban any aircraft from using LAX or cause aircraft operators to divert to other airports. LAWA's analysis concludes that air carriers that would otherwise engage in non-conforming operations would continue to operate by reducing their payload so that they can safely depart to the west or occasionally delay individual flights until more favorable wind conditions exist. LAWA also asserts that the proposed restriction would improve efficiency by reducing FAA air traffic workload since, when the airport is currently 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."[75] LAWA asserts that this FAA workload would not be necessary if non-conforming operations were eliminated. LAWA concludes that the proposed restriction will improve the safe and efficient use of the navigable airspace by eliminating non-conforming operations without causing adverse impacts elsewhere.

FAA's Findings on Condition 3

FAA Air Traffic Control (ATC) personnel are charged with maintaining the safe and efficient use of the National Airspace System (NAS). As part of this mission, the LAX Tower and Southern California Terminal Radar Control (SCT) have established procedures which ensure that Over-Ocean and Westerly Operations provide for safe and efficient use of the navigable airspace. Currently, on most nights of the year, all aircraft depart to the west when the airport is in such a configuration. Since LAWA proposes that all aircraft depart to the west on all nights when ATC is operating the airport in Over-Ocean and Westerly Operations, there would be no change to the safe and efficient use of the navigable airspace.

It should be understood that FAA ATC is not governed by airport noise restrictions. Should FAA approve LAWA's proposed restriction, it would not apply to ATC, and ATC would not enforce it. . The FAA would continue to recognize the authority of the pilot in command under 14 CFR §91.3. If LAWA's restriction were in effect and the pilot in command requested a non-–conforming easterly departure, as a courtesy, ATC may remind the pilot of the airport noise restriction, but ATC would ultimately honor the pilot in command's runway departure request.[76]

[72] 49 U.S.C. § 47524(c)(2)(C).
[73] 14 C.F.R. § 161.305(e)(2)(iii).
[74] LAWA Part 161 Application, Paragraph 8.3, page 114.
[75] LAWA Part 161 application, Section 7.5, page 102, second bullet.
[76] FAA's safety findings within Condition 3 relate to the safety of the navigable airspace, which includes that airspace above the minimum altitudes of flight prescribed by FAA regulations, including airspace needed to ensure safety in the takeoff and landing of aircraft. The

FAA analysis of LAWA's evidence that the proposed restriction maintains safe and efficient use of the navigable airspace

The FAA disagrees with LAWA's assertion that eliminating easterly non-conforming departures would reduce ATC workload. According to LAX Tower, Over-Ocean Operations is the preferred and most utilized configuration from 12:00 midnight and 6:30 a.m. In Over-Ocean Operations, departures travel west towards the arrivals (referred to as contra-flow operations), whereas non-conforming departures travel east, away from the arrivals. According to both SCT and the LAX Tower, given the prevalence of contra-flow operations during these nighttime hours and the increased safety risk associated with directing an aircraft to fly towards an approaching aircraft, there is actually a higher air traffic control workload in maintaining safety and efficiency for conforming Over-Ocean departures than for non-conforming easterly departures.

The FAA also disagrees that efficiency would be improved if aircraft operators were to delay flights and/or offload payloads in order to depart to the west. According to the LAX Airport Traffic Control Tower, given the level of operations and limited space at LAX, a flight that requests to wait for conforming departure conditions may need to wait away from their gate. This may cause challenges for other taxiing aircraft. A flight that occupies a gate for a longer period to offload payload also reduces efficiency.

FAA FINDING: Based upon existing ATC directives, the proposed nighttime restriction at LAX maintains safe and efficient use of the navigable airspace; therefore, Condition 3 is satisfied.

discussion of safety in Condition 4 (in which FAA indicates that LAWA's application fails to take into account whether changing the current voluntary regime to a mandatory one might affect response and authority of the pilot in a way that could introduce an unnecessary risk), is in the context of pilot in command decision making prior to actual takeoff.

Condition 4: "The proposed restriction does not conflict with any existing Federal statute or regulation."[77]

Essential information needed to demonstrate this condition includes evidence that no conflict exists between the proposed restriction and any existing Federal statute or regulation, which includes those governing exclusive rights, control of aircraft operations, and existing Federal grant agreements.[78]

The FAA finds that LAWA fails to demonstrate by substantial evidence that the proposed restriction would not conflict with Federal regulations that are structured to control the safety of aircraft operations, Grant Assurance 22, and a Federal statute. Therefore, Condition 4 is not satisfied.

Evidence submitted by LAWA in support of Condition 4

LAWA concludes that the proposed restriction satisfies Condition 4 because it (1) does not grant any exclusive rights or impair competition; (2) would apply (subject to exemptions for government aircraft and medical emergencies) to all operators of aircraft at LAX and require them to conform their departures to prevailing flows at the airport; and (3) exempts government aircraft. Based on these factors, LAWA concludes that the proposed restriction would not violate Grant Assurances 23, 27, or 49 U.S.C. § 47103(e) (prohibiting a grant of exclusive rights). LAWA states that the FAA should find that the proposed restriction does not conflict with any existing Federal statute or regulation and that it satisfies Condition 4.

FAA's Findings on Condition 4

The FAA agrees with LAWA's findings regarding exclusive rights and Grant Assurances 23 and 27. However, LAWA fails to demonstrate that the proposed restriction does not present a conflict with existing Federal statutes and regulations that govern the control of aircraft operations. As discussed in detail below, LAWA's application fails to take into account whether changing the current voluntary regime to a mandatory one might affect the response and authority of the pilot to judge safe operations in a way that could introduce an unnecessary risk. Unlike wind, weather, and aircraft limitations, this restriction on easterly departures and the prospect of an injunction or a financial penalty introduce factors that could influence operators and pilots to reduce safety margins in making operational decisions.

An airport sponsor may not interfere with the safety-based actions of the aircraft operator. The FAA is concerned that by imposing a restriction with penalties on aircraft operator decisions to take off with a headwind rather than a tailwind,[79] LAWA's proposed restriction could establish a conflict with regulations in 14 CFR 91.3 (a) *Responsibility and Authority of the Pilot in Command*, which states that the Pilot in Command (PIC) of an aircraft is the final authority as to the operation of that aircraft. Conflicts with the Federal structure of PIC authority can introduce an increase in risk level which can have serious safety implications. LAWA also fails to demonstrate that the proposed restriction does not present a conflict with Grant Assurance 22 which requires airports to be operated on reasonable terms.

FAA analysis of LAWA's evidence on exclusive rights (49 U.S. C. §§ 40103(e) and 47107(a)

[77] 49 U.S.C. § 47524(c)(2)(D).
[78] 14 C.F.R. § 161.305(e)(2)(iv).
[79] Draft Ordinance Sections 7 and 8 provide for civil penalties and potentially injunction or other enforcement if operators continue to conduct non-conforming departures. LAWA Application at p. 21.

and Grant Assurance 23)

Both 49 U.S.C. §40103 (e) and 47107(a)(4) prohibit airports on which government money has been expended from providing or intending to provide an exclusive right to use the airport. Grant Assurance 23 implements the statutory language and prohibits such action both directly and indirectly.[80] The assurance provides that an airport sponsor "will permit no exclusive right for the use of the airport by any person providing, or intending to provide, aeronautical services to the public." [81]

An exclusive right arises when an airport sponsor disparately treats similarly situated users. LAWA's proposed restriction does not make any distinction between aircraft users by aircraft category or type (i.e., passenger, cargo), aircraft weight or size. The proposed restriction does not deny the privilege of using the airport's runways to any specific user nor does it specifically exclude any aircraft from enjoying and exercising the same rights as any other aircraft utilizing the airport. Accordingly, the restriction does not establish an "exclusive right" that violates Grant Assurance 23, or 49 U.S.C. §§ 40103(e) or 47107(a)(4).

FAA analysis of LAWA's evidence on control of aircraft operations

While Condition 3 is focused on the safe and efficient use of the navigable airspace as managed by FAA ATC, the "control of aircraft operations"[82] under Condition 4 includes elements specifically related to the responsibilities of aircraft and airport operators. The term "control of aircraft operations" encompasses a number of different responsibilities, with safety through aggressive risk management[83] being the most important. Indeed, Congress has directed the FAA to make safety the "highest priority" for air commerce and the operation of the airport and airway system.[84] This includes preventing deterioration in established safety procedures in order to "maintain the safety vigilance that has evolved in air transportation and air commerce and has come to be expected by the traveling and shipping public."[85]

In response to these statutory directives, the FAA has promulgated numerous regulations governing flight safety. [86] These include Federal airworthiness standards; certification of the safety of operators seeking to transport cargo or members of the public in specified operations; the operation of aircraft in specific classes of airspace; and the flight rules under which an aircraft is operated such as minimum distances required for take-off, and runway selection.[87] Aircraft operators must comply with the conditions of their FAA-approved Airplane Flight Manual which is engineering-based and delineates the margins and limitations for the safe operation of aircraft. The FAA's regulation of aviation safety is comprehensive and exclusive.

Under the existing Runway Use Policy at LAX, the FAA ATC allows Over-Ocean and Westerly

[80] An exclusive right can be conferred either by express agreement, by the imposition of unreasonable standards or requirements, or by any other means. Such a right conferred on one or more parties, but excluding others from enjoying or exercising a similar right or rights, would be an exclusive right. See FAA Order 5190.6B.
[81] Aeronautical activities include, but are not limited to air carrier operations, cargo, charter flights, re-positioning flights, and ferry flights.
[82] 14 C.F.R. § 161.305(e)(2)(iv).
[83] See Risk Management Handbook, Federal Aviation Administration, Flight Standards Service, 2009, p. 1-6.
[84] 49 U.S.C. §§ 40101(a), 47101.
[85] 49 U.S.C. §§ 40101(a)(3).
[86] See, e.g., 14 CFR Part 91 General Operating and Flight Rules includes safety-related provisions such as Pilot in Command Authority (PIC), Airplane Flight Manual Limitations (also covered by 14 CFR Part 25 Airworthiness Standards: Transport Category Airplanes); 14 CFR Part 121 Air Carrier Certification, 14 CFR Part 119 Certification: Air Carriers And Commercial Operators, and 14 CFR Part 129 Foreign Air Carrier Operations in the United States.
[87] Runway selection is based on safety and operational and considerations (i.e., the most suitable runway considering the probable wind velocity, effective runway gradient, and ambient temperature), and pilot request. *See* FAA Order 7110.65 *See also* FAA Orders 7210.3 Facility Operations and Administration.

departures with a tailwind of no more than 10 knots.[88] The vast majority of departures at LAX can be conducted with a tailwind component. However, the preferred mode of aircraft operations is into the wind (headwind) and a tailwind is less optimal. Aircraft performance, weight (including the weight of passengers, cargo and fuel), runway length and surface condition (dry, wet or icy), obstacle clearance, wind (velocity, direction and gustiness), temperature and other weather conditions are factors that must be considered.

PIC authority is a *critical* element of safe operations. Under Federal regulations, the PIC of an aircraft is directly responsible, and is the final authority, for the operation of that aircraft.[89] The ultimate responsibility for accepting a takeoff or landing clearance rests with the PIC. During Over-Ocean or Westerly Operations at LAX, the PIC is responsible for accepting a takeoff clearance to the west or requesting an easterly departure. It is the PIC's prerogative to request a departure on a runway with a headwind component in order to maximize the takeoff performance of the airplane or to meet minimum takeoff runway length requirements for the weight of the aircraft. Conducting tailwind operations without consideration of all operational parameters can increase risk and create undue safety hazards to flight operations.[90] A monetary fine for taking off to the east and the threat of injunction (see below) introduce non-operational factors that could induce increased risk by unduly influencing the judgment and prerogative of the PIC.

Recognizing PIC authority and limitations on tailwind departures, FAA ATC will accommodate a pilot's request for an easterly departure at LAX when the tailwind component for a westbound departure is between 0 and 10 knots.[91] Easterly non-conforming departures are a small minority of aircraft takeoffs and are concentrated among aircraft flying to distant Asia Pacific airports, heavily loaded with fuel to fly such distances in addition to passenger and/or cargo loads. The operators and the PICs of these aircraft may appropriately opt for the highest safety margin available by departing easterly with a headwind, instead of to the west with a tailwind.[92]

LAWA's proposed ordinance states that it "may be judicially enforced by injunction or other relief deemed appropriate by any court of competent jurisdiction." Proposed Ordinance § 8(a).[93] The FAA is concerned that LAWA's proposed restriction potentially reaches into the cockpits of individual aircraft and interacts with safety parameters affecting critical departure decisions. The FAA ATC would continue to honor PIC requests for easterly departures even if this restriction were in effect, and the FAA also has confidence in the professional decisions of PICs. Nevertheless, constraining the pilot's decision via injunction could potentially conflict with 14 CFR 91.3 (a) *Responsibility and Authority of the Pilot in Command.* It also could run contrary to the overarching structure of 14 CFR Part 91, which vests the ultimate authority for these types of

[88] The FAA issued a waiver under FAA Order 8400.9 *National Safety and Operational Criteria for Runway Selection Plans and Noise Abatement Runway Use Programs*, which provides a safety-based process for airports like LAX to identify operational parameters for the safe arrival and departure of aircraft. These criteria are applicable to all runway use programs for turbojet aircraft. The Order provides parameters in the form of safety and operational criteria that must be used in the evaluation of informal runway use programs.

[89] See 14 CFR 91.3 (a), *Responsibility and Authority of the Pilot in Command*.

[90] NTSB accident investigations have identified safety margin reductions as contributing causes in accidents.

[91] If in the interest of safety a runway different from that specified in a runway use program is preferred, the pilot is expected to advise ATC accordingly. ATC will honor such requests and advise pilots when the requested runway is noise sensitive, per *FAA Order 8400.9, National Safety and Operational Criteria for Runway Use Programs* which references operationally advantages, or a pilot request.

[92] For example, a Quantas Airlines Captain noted that Qantas has a 99% compliance rate with the voluntary Over Ocean Operation program, but explained that "in order to reach Australia they can't do anything but take off with maximum fuel load and take-off weight" and that the safety of the flight "is the primary factor in making the decision to take off to the east." At the same venue, an EVA Airlines Captain stated that they are "always mindful of their noise impacts on the residents, but that safety is their primary consideration." *LAX/Community Noise Roundtable*, September 11, 2002. LAWA's Part 161 Application, Appendix D Nonrestrictive Alternatives – Communications with Airlines, p. 3-4.

[93] By contrast, the existing LAX Rules and Regulations do not limit the discretion of the pilot with respect to the full utilization of the airport facilities in an unusual situation. LAX Rules and Regulations, p. 5-1.

operational decisions squarely with the PIC. In view of these concerns, the FAA cannot, on the basis of information provided by LAWA, conclude that there would not be a conflict with regulations governing control of aircraft operations. Under Part 161, the applicant has the obligation to demonstrate the applicable conditions will be met. LAWA's discussion of Condition 4 and its analysis of the consequences of the proposed restriction fail to adequately demonstrate the absence of a conflict with the PIC authority and related safety concerns.

The FAA understands that LAWA does not intend in any way to erode aviation safety. LAWA's proposed solution for aircraft that are currently non-conforming because they are unable to safely take off to the west with tailwind conditions is for these aircraft to reduce weight by offloading cargo, passenger bags, and/or passengers. LAWA has not provided substantial evidence to show that operators affected by the restriction are likely to be able to plan ahead and make these decisions in advance. Alternatively, aircraft operators could hold flights for more favorable wind conditions.[94] Delaying airplane departures in this manner would present further operational problems because crews with duty time limits have very little leeway to absorb any delay, particularly of unknown duration. This factor increases the complexity of the factors involved in PIC decisions. Neither solution suggested by LAWA fully resolves the tension that could be established between the proposed restriction and PIC authority under FAA regulations

FAA analysis of LAWA's evidence on Grant Assurance 22, Economic Non-Discrimination.

Grant Assurance 22 has a broader reach than its title "Economic Non-Discrimination" suggests; it is not limited in application to conflicts between classes or types of operations.[95] The assurance includes a separate reasonableness requirement. Grant Assurance 22 implements the provisions of 49 U.S.C. § 47107(a)(1) through (6), and requires, in pertinent part, that the owner or sponsor of a Federally obligated airport:

"...will make its airport available as an airport for public use on reasonable terms, and without unjust discrimination, to all types, kinds, and classes of aeronautical activities, including commercial aeronautical activities offering services to the public at the airport."

The concepts of reasonableness and unjust discrimination that inform the core of this assurance are discussed under Condition 1, and are incorporated herein by reference.[96] Additionally, a determination under Grant Assurance 22 as to whether an access restriction is reasonable will necessarily consider the safety, since a restriction that is unsafe is also unreasonable. In the discussion above, we indicate our concern with regard to safety and a potential conflict with the PIC authority. These same concerns lead us to the conclusion that LAWA has also failed to demonstrate the absence of a conflict with Grant Assurance 22. [97]

FAA analysis of LAWA's evidence on Grant Assurance 27, Use by Government Aircraft

[94] As LAWA acknowledges, the same wind conditions can affect individual aircraft and airlines differently. This is due to variations in approved Airplane Flight Manuals (AFM), Flight Management Systems (FMS), and/or airline-specific standard operating procedures, including runway take-off gross weight (RTOG) computations and computer-based weight & balance systems.
[95] FAA Order 5190.6B, ¶¶ 8.8, 14.3.
[96] This determination applies whether the sponsor offers a safety justification for the restriction under Assurance 22 (i), or if the sponsor claims a noise restriction is safe but the restriction appears to FAA to have safety implications. FAA's safety review can consider not only actions required by the sponsor, but also punitive or incentive measures that could encourage unsafe practices.

LAWA provides evidence that the proposed restriction exempts access for U.S. government aircraft. Accordingly, LAWA correctly concludes that it does not violate Grant Assurance 27.

FAA FINDING: LAWA fails to demonstrate by substantial evidence that the proposed restriction would not conflict with Federal regulations that are structured to control the safety of aircraft operations and with Grant Assurance 22; therefore, Condition 4 is not satisfied.

Condition 5: "The applicant has provided adequate opportunity for public comment on the proposed restriction."[98]

Essential information needed to demonstrate this condition includes evidence that there has been adequate opportunity for public comment on the restriction as specified in Sec. 161.303 or Sec. 161.321 of this part.[99]

Evidence submitted by LAWA in support of Condition 5

Evidence that LAWA has provided adequate opportunity for public comment on the proposed restriction

LAWA contacted all affected tenants and general public in the study area and conducted public presentations and community information workshops starting on March 17, 2004 and culminating in November 2012. (See section 2.9 and Table 1 "Listing of Presentations and Community Information Workshops" in LAWA's Part 161 application). LAWA issued a notice announcing the proposed restriction, which was published in ten local publications in English and Spanish. which it described as "*a ban on all aircraft departures to the east, including but not limited to Stage 3 aircraft, with certain exceptions, from 12:00 midnight and 6:30 a.m. when the airport is in Over-Ocean or WesterlyOperations."*

The Notice and Draft LAX Part 161 Study application and supporting materials were made available for public inspection during the comment period at the following locations:

- On-line at www.laxpart161.com/
- LAWA Environmental Services Division
- Inglewood Public Library
- County of Los Angeles Public Library
- Mark Ridley Thomas Constituent Services Center
- Westchester – Loyola Village Branch Library

City Halls within the airport noise study area received an electronic copy on disk. 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 Airport Noise Study Area
- LAX/Community Noise Roundtable members
- Los Angeles County Supervisors
- State Legislators that have constituents in the Airport Noise Study Area
- U.S. Congressional Delegation
- FAA Offices
- California Department of Transportation (Caltrans) Division of Aeronautics
- Federal, state, and local agencies with land-use jurisdiction in the Airport Noise Study Area

[98] 49 U.S.C. § 47524(c)(2)(F).
[99] 14 C.F.R. § 161.305(e)(2)(v).

- LAX fixed-base operators
- Chambers of Commerce
- Los Angeles Neighborhood Councils (within the Airport Noise Study Area)
- Southern California Association of Governments (SCAG)
- Los Angeles Area Advisory Committee
- Libraries
- Inquiries from Part 161 Website

LAWA made presentations to the LAX/Community Roundtable and held public meetings to permit the general public to ask questions related to the proposed restriction.

- 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.
- On November 1, 2012 LAWA released the Proposed Restriction for public review and on December 17, 2012 the official 45 day public day comment period was completed.

The following Appendices contained detailed public involvement.

- Appendix A Public Comments Email/Hotline
- Appendix B Public Outreach Documentation/Initial Public Meetings November 2006
- Appendix C Public Workshop/Meeting November 2012 and Public Comments
- Appendix D Nonrestrictive Alternatives Communications with Airlines

FAA's Findings on Condition 5

Evidence that LAWA has provided adequate opportunity for public comment on the proposed restriction

The application demonstrates that the conditions of 14 CFR 161.305(e)(2)(v) have been addressed. Public notice and consultation were carried out in accordance with Part 161. A public docket was established by the airport as well as a web site. This airport docket must remain open and available for public review for as long as any approved restriction is in effect.

The comment period allowed by LAWA followed regulatory requirements. Comments received have been made available on line and via compact disk to commenting and consulted parties. LAWA has chosen to submit only one restriction to the FAA for final approval, and, after its docket comment period closed, did not propose changes to its originally proposed restriction. No new notice or comment opportunity is required..

FAA FINDING: LAWA demonstrates by substantial evidence that it has provided adequate opportunity for public comment on the proposed restriction; therefore, Condition 5 is satisfied.

Condition 6: "The proposed restriction does not create an undue burden on the national aviation system."[100]

Essential information needed to demonstrate this condition includes evidence that the proposed restriction does not create an undue burden on the national aviation system such as:

(A) An analysis demonstrating that the proposed restriction does not have a substantial adverse effect on existing or planned airport system capacity, on observed or forecast airport system congestion and aircraft delay, and on airspace system capacity or workload;

(B) An analysis demonstrating that non-aircraft alternative measures to achieve the same goals as the proposed subject restrictions are inappropriate;

(C) The absence of comments with respect to imposition of an undue burden on the national aviation system in response to the notice required in §161.303 or §161.321.[101]

While the FAA does not agree with aspects of LAWA's evidence as discussed below, the FAA believes that the proposed restriction would not create an undue burden on the national aviation system. Therefore, Condition 6 is satisfied.

Evidence submitted by LAWA in support of Condition 6

LAWA provides evidence to support Condition 6 based upon the three categories of essential information.

LAWA states that there would be no adverse effects on airport system capacity, congestion or delay and that the proposed restriction would actually reduce ATC workload under the assumption that flights not conforming to an airport's current configuration would result in a higher ATC workload. LAWA states that "[t]here is no reason to expect that requiring conformity would cause any congestion."[102]

In order to demonstrate that non-aircraft alternative measures to achieve the same goals are inappropriate, LAWA references the sound insulation program designed to make land uses within the CNEL 65 dB contour compatible with aircraft noise. LAWA assumed that all of the homes within the airport noise study area have already been insulated for purposes of its sleep awakenings analysis, and that there is no practical means of improving the quality of sound insulation to eliminate sleep awakenings.

Finally, in support of satisfying Condition 6, LAWA states that it has not received any comments during the course of developing the proposed restriction that the proposed restriction would impose an unreasonable burden on the national aviation system.

FAA's Findings on Condition 6

The FAA has reviewed LAWA's evidence in support of Condition 6. On several key aspects, the FAA disagrees with LAWA's assumptions and, therefore, questions some of LAWA's conclusions with respect to the effects of the proposed restriction and the appropriateness of non-aircraft alternative measures. However, the FAA does not believe that the proposed restriction

[100] 49 USC § 47524(c)(2)(F).
[101] 14 C.F.R. § 161.305(e)(2)(vi).
[102] LAWA Part 161 application, section 8.6, page 115.

would create an undue burden on the national aviation system.

FAA analysis of LAWA's evidence that there would be no substantial adverse effects on airport system capacity, congestion or delay and that the proposed restriction would reduce the FAA's workload

As discussed under Condition 3, the FAA disagrees with LAWA's statement that the proposed restriction would reduce ATC workload.

FAA also disagrees that aircraft operators would be able to proactively limit payload in advance of a flight's scheduled departure in order to avoid an aircraft delay. LAWA itself acknowledges that it is difficult to predict when tailwind and other conditions would dictate a non-conforming departure. Wind forecasts are subject to variability from actual conditions, and actual winds will vary in direction and speed throughout the time periods subject to the proposed restriction. Small variations in wind speed and direction (which are common during the lighter wind conditions, when the proposed restriction would be applicable) can have substantive impacts on aircraft performance. LAWA did not provide any evidence, such as an analysis of forecast variance from observed wind conditions, to indicate that aircraft operators would have sufficiently accurate forecasts to be able to proactively limit payload and avoid aircraft delays.[103] As a result, the proposed restriction would be likely to impact individual flights on the day of departure.

Aircraft operators would often be making decisions about reducing payload in real-time as the applicable wind conditions are occurring. This could result in aircraft being delayed from pushing back from the gate, or after taxi out prior to takeoff. In either case, aircraft delays would occur as the pilot and airline dispatch make decisions about offloading cargo, passengers, and/or fuel. For aircraft that have not yet left the gate, this additional coordination/re-planning and offloading time would result in a delay to leaving the gate. For aircraft that would have to return to a gate to offload payload, additional delay would occur with taxi time, mustering of ground crew, and finding an available gate. LAWA fails to adequately consider the effect of the proposed restriction on individual flights, or whether such delays at a gate-constrained airport such as LAX could result in delays to other aircraft scheduled to use that gate. FAA notes that the 10-minute and 20-minute delays assumed by LAWA with Scenarios 1 and 2 are conservative, as discussed under Condition 2. The FAA expects that longer delays would be more typical.

The FAA expects that most aircraft operators would choose to pay the fine for a non-conforming departure, rather than reduce payload and take an aircraft delay, as discussed under Condition 2. To the extent that aircraft operators choose this option, aircraft delays due to offloading would be commensurately reduced. In summary, the FAA considers that the proposed restriction would have an adverse impact on some aircraft operations (delay), but that there would not be an impact to systemic airport capacity or system congestion.[104] The scale and magnitude of delays would not rise to the level of a national impact.

[103] As FedEx's comments demonstrate, hour-to-hour variability in wind direction and velocity is greater than LAWA acknowledges. FedEx also calls into question LAWA's conclusion that lower number of non-conforming flights in the summer months was due to planned payload reduction.

[104] An exception could be during large-scale construction projects at LAX that reduce the airport's capacity during the hours prior to midnight. Spillover delays from before midnight would then subject to the mandatory restriction during Over-Ocean Operations and could result in delays that propagate through the National Airspace System. In this situation, ATC could elect to continue to operate in Westerly or Easterly Operations, rather than Over-Ocean Operations, per the LAWA Runway Use Policy.

FAA analysis of LAWA's evidence that non aircraft alternative measures to achieve the same goals as the proposed subject restrictions are inappropriate

As discussed under Condition 1, the FAA finds that LAWA has not adequately evaluated non-restrictive means to address the noise problem.

LAWA dismisses sound insulation as an appropriate alternative. The FAA's review of audits submitted for years 2002-2012 on LAX's sound insulation program, described under Condition 1, revealed that sound insulation has produced much better indoor noise reductions than LAWA assumes for purposes of its sleep awakenings analysis. The FAA believes that sound insulation should not have been dismissed as an inappropriate option.

FAA analysis of LAWA's evidence on the absence of comments with respect to imposition of an undue burden on the national aviation system

LAWA stated that it did not receive any comments that the proposed restriction would impose an unreasonable burden on the national aviation system. LAWA did receive comments from Airlines for America (A4A),[105] FedEx Corporation,[106] and the Cargo Airline Association[107] indicating that the proposed restriction would have adverse effects on their operations. A4A and FedEx commented that "the proposed mandatory restrictions would be unduly burdensome on the airlines."[108] In response to A4A, LAWA states that based on the information provided by the airlines and given the option to off-load weight,[109] they would not expect any aircraft operations to be discontinued as a result of the proposed restriction.[110]

The FAA acknowledges the comments by airline interests indicating that they consider the proposed restriction to be unreasonable. However, the FAA finds that no comments were received specifically stating that the proposed restriction would result in an unreasonable burden on the national aviation system.

FAA FINDING: LAWA's proposed restriction does not create an undue burden on the national aviation system; therefore, Condition 6 is satisfied.

[105] LAWA Part 161 Application, Appendix C, Page C-66.
[106] LAWA Part 161 Application, Appendix C, Page C-74.
[107] LAWA Part 161 Application, Appendix C, Page C-82.
[108] LAWA Application, Appendix C, p. C-68, C-74.
[109] LAWA characterizes this option as "more cost-effective" in comparison to discontinuing operations. However, as discussed under Condition 2, the FAA concludes that for passenger carriers offloading weight would be less cost-effective than paying a fine for a non-conforming departure.
[110] LAWA Application, Appendix C, p. C-69. LAWA responded to FedEx Express that, given its one non-conforming departure over the prior eight years, its concerns were overstated and failed to consider the benefits of the restriction. LAWA Application, Appendix C, p. C-75.

FAA Determination

ANCA requires an airport proprietor proposing a noise or access restriction affecting Stage 3 aircraft operations to meet all six statutory criteria, supported by substantial evidence, in order for the FAA to approve the proposed restriction.

LAWA's application does not demonstrate that the proposed nighttime departure restriction at LAX meets all six statutory conditions for approval under 49 U.S.C. 47524(c)(2) and 14 C.F.R. Part 161.

Therefore, the application is DISAPPROVED.

Benito De Leon 11/07/14

Benito De Leon
Deputy Associate Administrator for Airports