APPENDIX J AIRCRAFT OPERATIONS FORECAST MEMORANDUM AND FAA APPROVAL

Los Angeles
World Airports

August 2, 2012

Mr. Victor Globa
Environmental Protection Specialist
Federal Aviation Administration
Los Angeles Airports District Office
P.O. Box 92007
Los Angeles, CA 9009-2007

Subject: **Review and Approval of Los Angeles International Airport Part 161 Forecasts**

Dear Mr. Globa:

Los Angeles World Airports (LAWA) requests the Federal Aviation Administration (FAA) review and approval of 2013 and 2018 operations forecasts for the Los Angeles International Airport (LAX) Part 161. The attached technical memorandum describes the forecast methodology, and results in detail.

As the following table shows, the forecasts are consistent with the FAA's most recent (December 2011) Terminal Area Forecast (TAF) for LAX.

Year	P161 Forecast	December 2011 TAF	% Difference
2013	593,827	602,474	-1.4%
2018	649,476	679,332	-4.4%

If you have any comments or questions related to this request, please feel free to contact me at (424) 646-6499. Thank you for your assistance.

Sincerely,

Scott Tatro
Airport Environmental Manager I

ST:eb

cc: Michael Feldman
Eugene Reindel – HMMH

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SH&E International Air Transport Consultancy

FORECASTS OF AIRCRAFT OPERATIONS AT LAX - 2013 AND 2018

PART 161 DRAFT WORKING PAPER FOR DISCUSSION PURPOSES ONLY

Prepared by:
SH&E, Inc.
An ICFI Company

August 1, 2012

1.0 Introduction

Los Angeles World Airports (LAWA) is conducting a Part 161 Study to determine the potential impacts of a proposed restriction on eastbound aircraft departures at Los Angeles International Airport (LAX) between midnight and 6:30 AM while the airport is in Over-Ocean or Westerly Operations. Currently, pilots can request to take off to the east during this time period. They make these requests most often to avoid taking off with a tailwind when a wind under 10 knots is blowing from the east.

To help measure the potential impacts of the proposed restriction, three forecasts of aircraft operations have been prepared: a 2013 Base Year forecast, a 2018 forecast of operations under current operating procedures, and a 2018 forecast reflecting the potential change in operations as a result of the proposed restriction.

Information analyzed during the preparation of these forecasts includes LAX airport records, USDOT T100 data, OAG passenger and all cargo schedules, FAA Tower Counts, FAA ASDI information (via FlightAware.com), FAA ETMSC data, ACAS airline fleet data, and industry forecasts prepared by Airbus, Boeing and the FAA.

At the time the Part 161 forecasts were prepared, it was not clear whether American Airlines will continue to operate independently after emerging from bankruptcy or merge with another airline. The future of American Airlines is likely to have a substantial impact on total operations at LAX but will have little or no impact on non-conforming eastbound night departures, the subject of this study.

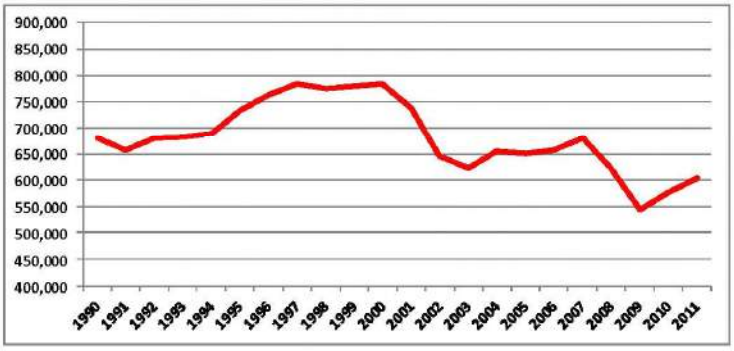
These forecasts reflect the view that American will continue to operate independently and they consequently do not attempt to reflect the extensive system changes that a merger could bring. The forecasts reflect the projected retirement of American MD-80 aircraft by 2018 which was expected before the bankruptcy filing, but do not reflect the potential end of operations in small regional jets (50 or fewer seats) by American Eagle which bankruptcy has made more likely.

2.0 2013 Base Year Forecast

Exhibit 1 shows annual aircraft operations at LAX from 1990 to 2011. After decreasing from 1990 to 1991, operations averaged 3% growth to 1997 and remained steady at an average rate of 780,000 operations a year from 1997 to 2000. The 9-11 terrorist attacks and 2001 economic recession caused operations to fall to 623,000 per year by 2003. This was followed by a period of moderate growth through 2007.

The economic downturn that began in 2008 caused operations to drop very sharply falling to 545,000 in 2009. Since then LAX operations have begun to recover despite continued widespread weakness in the U.S. and global economy, with 5.3% average annual growth from 2009 to 2011.

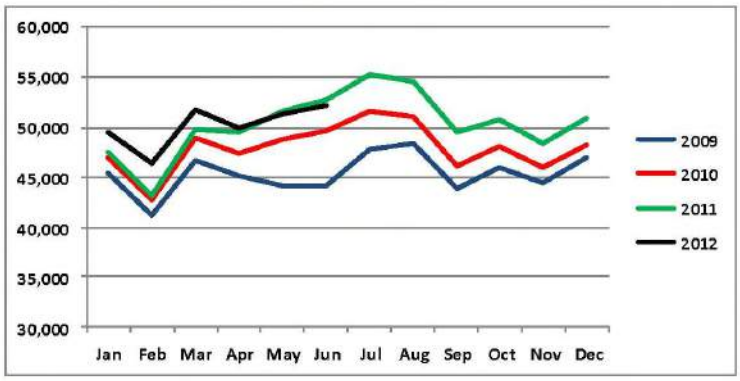
Exhibit 1: LAX Annual Aircraft Operations



Source: FAA ATADS Airport Operations Report

Exhibit 2 provides a more detailed view of the current recovery in aircraft operations at LAX. The pattern of monthly operations from 2009 through June 2012 shows that 2010 exceeded 2009 throughout the year, and except for the first quarter 2011 consistently showed growth over 2010. Growth continued during the first quarter of 2012, but operations in the second quarter of 2012 do not show any year over year growth. While LAX operations have begun to recover from the 2008-2009 downturn, weak economic growth is limiting the recovery at LAX.

Exhibit 2: LAX Monthly Aircraft Operations



Source: FAA ATADS Airport Operations Report

The 2013 Base Year forecast calls for LAX operations to generally remain at current levels with approximately 594,000 annual operations. This reflects the view that any further substantial recovery in aviation will depend largely on achieving stronger economic growth in the U.S. and in other leading economies, finding solutions to the Eurozone crisis, and other positive economic developments.

Exhibit 3 summarizes the 2013 Base Year forecast scenario.

Exhibit 3: LAX 2013 Base Year Forecast

Market Segment	2013 Operations	Share
Domestic Passenger	458,190	77.2%
International Passenger	89,478	15.1%
All Cargo	24,086	4.1%
General Aviation	22,073	3.7%
Total	593,827	100.0%

Source: SH&E analysis

Domestic passenger operations account for over three fourths of total aircraft operations, with international passenger operations adding 15.1%. All cargo and general aviation flights account for 4.1% and 3.7% of LAX operations, respectively.

Exhibit 4 shows the types of aircraft expected to perform 2013 domestic passenger operations.

Exhibit 4: LAX 2013 Base Year Forecast Domestic Passenger Operations

Aircraft Type	2013 Operations	Share
737 Next Gen	113,040	24.7%
Regional Jet	106,356	23.2%
A319/320/321	70,484	15.4%
757	53,602	11.7%
Brasilia	37,528	8.2%
737 Classic	35,360	7.7%
767	24,716	5.4%
MD80	5,110	1.1%
Dash 8	5,006	1.1%
Other	6,988	1.5%
Total	458,190	100.0%

Source: SH&E analysis

Boeing 737 Next Gen aircraft, regional jets, and Airbus A320 family aircraft account for over 60% of all domestic passenger aircraft operations at LAX. MD-80 aircraft are expected to account for only a small share of operations in 2013, and these aircraft are expected to be retired by 2018.

Exhibit 5 shows the aircraft expected to be used for international passenger operations in 2013.

Exhibit 5: LAX 2013 Base Year Forecast International Passenger Operations

Aircraft Type	2013 Operations	Share
777	23,986	26.8%
737 Next Gen	18,040	20.2%
A319/320/321	14,080	15.7%
747	10,432	11.7%
A330/340	8,236	9.2%
Regional Jet	6,362	7.1%
A380	2,920	3.3%
737 Classic	2,398	2.7%
767	834	0.9%
757	730	0.8%
Dash 8	730	0.8%
MD80	730	0.8%
Total	89,478	100.0%

Source: SH&E analysis

Boeing 777s are projected to be the most frequently used aircraft for international passenger operations, followed by narrow body 737 and A320 family aircraft used for intra-Americas service.

Exhibit 6 shows the aircraft expected to be used for all-cargo operations in 2013. Boeing 747-400 and 767 freighters are expected to account for the largest share of all-cargo operations at LAX in 2013.

Exhibit 6: LAX 2013 Base Year Forecast All-Cargo Operations

Aircraft Type	2013 Operations	Share
747-400	5,208	21.6%
767	4,900	20.3%
MD11	3,650	15.2%
A300	3,340	13.9%
DC10/MD10	2,506	10.4%
777 Freighter	1,564	6.5%
747-8F	1,456	6.0%
757	522	2.2%
Convair 580	522	2.2%
747 Classic	418	1.7%
Total	24,086	100.0%

Source: SH&E analysis

3.0 2018 Forecast under Current Operating Procedures

The following table shows the growth in aircraft operations projected to occur from 2013 to 2018 if no new restrictions are enacted.

Exhibit 7: 2018 Growth in Aircraft Operations with No New Restrictions

Market Segment	2013 Baseline	2018 No New Restrictions	Avg Annual Growth Rate
Domestic Passenger	458,190	494,802	1.5%
International Passenger	89,478	105,540	3.4%
All Cargo	24,086	26,586	2.0%
General Aviation	22,073	22,548	0.4%
Total	593,827	649,476	1.8%

Source: SH&E analysis

The 2018 operations forecast under this scenario calls for modest growth in commercial aviation as passenger and cargo airlines continue to limit capacity growth to achieve improved profitability. Seat capacity is expected to grow faster than passenger airline operations as airlines replace aging aircraft with larger ones to reduce the average cost per seat mile.

Exhibit 8 shows the growth in weekly passenger aircraft seat departures associated with the operations forecast.

Exhibit 8: 2018 Growth in Weekly Passenger Seat Departures

Market Segment	2013 Baseline	2018 No New Restrictions	Avg Annual Growth Rate
Domestic	544,730	600,891	2.0%
International	208,443	249,670	3.7%
Total	753,173	850,561	2.5%

Source: SH&E analysis

Between 2013 and 2018 domestic seat departures are projected to increase at an average rate of 2.0% per year, 0.5% faster than the growth in domestic passenger aircraft operations. International seat departures are projected to

increase at a 3.7% annual rate, compared to 3.4% growth in international passenger aircraft operations.

Exhibit 9 shows the projected changes in domestic passenger aircraft operations by aircraft type between 2013 and 2018. Notable changes include substantial increases in Boeing 737 Next Gen and Airbus A320 family operations and the end of MD-80 operations at LAX. Southwest Airlines recent decision to upgrade the cabins of 100 of its 737 Classic aircraft supports the view that these aircraft will continue to account for a substantial number of LAX operations in 2018.[1]

Exhibit 9: Change in Domestic Passenger Aircraft Operations 2013-2018

Aircraft Type	2013	2018
737 Next Gen	113,040	143,288
Regional Jet	106,356	108,132
A319/320/321	70,484	82,790
757	53,602	51,620
Brasilia	37,528	37,528
737 Classic	35,360	35,986
767	24,716	24,924
MD80	5,110	0
Dash 8	5,006	5,006
Other	6,988	5,528
Total	458,190	494,802

Source: SH&E analysis

[1] www.flightglobal.com, 20 Jul 2012

Exhibit 10 shows the projected changes in international passenger aircraft operations.

Exhibit 10: Change in International Passenger Aircraft Operations 2013-2018

Aircraft Type	2013	2018
777	23,986	27,636
737 Next Gen	18,040	21,900
A319/320/321	14,080	16,270
747/747-8	10,432	10,118
A330/340	8,236	9,280
Regional Jet	6,362	6,674
A380	2,920	4,380
787	0	2,920
737 Classic	2,398	2,398
Dash 8	730	1,460
767	834	1,252
757	730	730
A350	0	522
MD80	730	0
Total	89,478	105,540

Source: SH&E analysis

Notable changes in international passenger aircraft operations include growth in A380 operations, a decrease in total 747 activity despite the introduction of some 747-8 passenger flights, introduction of service by 787 and A350 aircraft, and the end of MD-80 operations.

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Exhibit 11 shows the projected changes in all-cargo aircraft operations.

Exhibit 11: Change in All-Cargo Aircraft Operations 2013-2018

Aircraft Type	2013	2018
747-400	5,208	6,666
767	4,900	5,840
MD11	3,650	3,546
A300	3,340	3,548
DC10/MD10	2,506	1,566
777 Freighter	1,564	1,774
747-8F	1,456	2,602
757	522	522
Convair 580	522	522
747 Classic	418	0
Total	24,086	26,586

Source: SH&E analysis

The 747-400 freighter (including the new variants) will continue to be the workhorse of the international air cargo industry. Boeing 767 and 777 freighter operations are expected to continue growing as high fuel prices continue to make these fuel efficient aircraft attractive to many carriers. High fuel and maintenance costs are expected to end all 747 Classic freighter operations at LAX by 2018, while the recently announced FedEx order for new 767-300 freighters could cause some of the DC10/MD10 operations to shift to 767s[2].

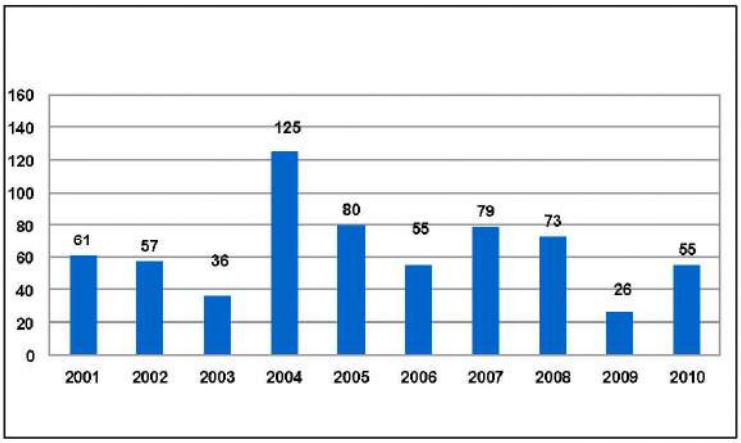
[2] The FedEx order for 27 new 767-300 freighters was announced on December 15, 2011

4.0 2018 Forecast with the Proposed Restriction

Under current regulations pilots are able to request permission from the control tower to conduct eastbound departures when the airport is in Over Ocean operations. These eastbound departures are termed "non-conforming

Exhibit 12 shows the number of annual non-conforming departures from 2001 to 2010.

Exhibit 12: Annual Non-Conforming Eastbound Departures – 2400 to 0630



Source: LAX airport records

The number of non-conforming departures depends primarily on weather conditions, and no direct relationship between non-conforming departures and total departures between 2400 and 0630 has been found. For this reason, the expected modest growth from 2013 to 2018 in departures between 2400 and 0630 is not expected to affect the future number of non-conforming departures. The 2018 forecast of non-conforming departures is 65 per year, based on a 130 month (June 2000- March 2011) sample of non-conforming flight data in the LAWA East Departure Gate Penetration report.

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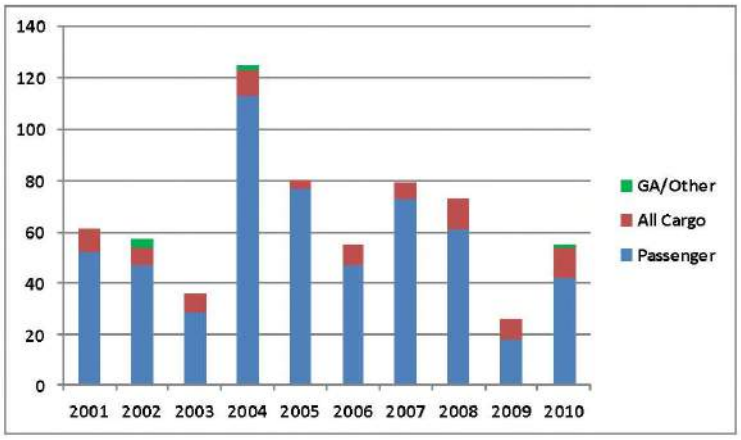
The following chart shows non-conforming departures by type of flight. From 2001 through 2010, passenger flights accounted for 86% of non-conforming departures, all-cargo flights for 13%, and general aviation/other flights for 1%[3].

Exhibit 13: Non-Conforming Eastbound Departures by Type of Flight



Source: LAX airport records

[3] The "other" category consists of one passenger aircraft flight being ferried to a maintenance base.

The proposed restriction would ban all non-conforming departures between 2400 and 0630. Exhibit 14 shows the 2018 annual departures that would be affected by time period and the type of flight.

Exhibit 14: 2018 Departures Affected by Proposed Restriction by Time Period

	2400-0059	0100-0359	0400-0630	Total
Passenger	33	18	0	51
All Cargo	2	0	12	14
Total	35	18	12	65

Source: SH&E analysis

With the proposed restriction in place in 2018, an estimated 33 passenger flights that would have preferred a non-conforming east departure between 2400 and 0059 and an additional 18 passenger flights between 0100 and 0359 would not be permitted to take off to the east. Two all-cargo flights between 2400 and 0059 and 12 all-cargo flights between 0400 and 0630 would also not be permitted to take off to the east.

Based on analysis of past non-conforming departures, airlines would most likely respond to the proposed restriction by limiting the payload of the affected operations rather than delaying or rescheduling departures or transferring operations to another airport. If the proposed restriction were enacted, there would be no reduction in total 2018 operations at LAX, but the 65 flights that would have departed to the east would now depart with reduced payload to the west. As a result, there is no difference between the two 2018 forecast scenarios in the total number of aircraft operations or types of aircraft used, although there would be costs to the airlines from operating with reduced payloads to offset the effects of tailwinds on takeoffs.

5.0 Comparison to the FAA Terminal Area Forecast

The FAA Terminal Area Forecast (TAF) represents a standard against which other aviation forecasts are frequently measured. Exhibit 15 compares total 2013 and 2018 aircraft operations from the LAX Part 161 forecast to the 2011 TAF, the most recently released version at the time this forecast was prepared.

Exhibit 15: Comparison of Part 161 Forecasts to the 2011 TAF

	ATADS Part 161	TAF	Percent Difference
2000	783,684	781,418	0.3%
2001	738,679	783,160	-5.7%
2002	644,854	637,588	1.1%
2003	623,370	630,755	-1.2%
2004	654,787	646,919	1.2%
2005	650,539	653,534	-0.5%
2006	656,842	653,181	0.6%
2007	680,954	672,245	1.3%
2008	622,506	659,221	-5.6%
2009	544,833	544,614	0.0%
2010	575,835	570,983	0.8%
2011	603,912	596,194	1.3%
2013	593,827	602,474	-1.4%
2018	649,476	679,332	-4.4%

Source: FAA 2011 TAF, SH&E analysis

Total operations in the Part 161 forecast correspond closely to the TAF results. The Part 161 forecast is 1.4% lower than the TAF for 2013 and 4.4% lower in 2018.

The Part 161 forecasts (like the ATADS data used in their preparation) are based on calendar year data, while the TAF is based on fiscal years ending in September. This accounts for differences in historical data for 2001 and 2008, years in which pronounced changes in activity took place during the fourth quarter.

FAA Review and Approval of Aircraft Operations Forecast

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

Western-Pacific Region
Airports Division
Los Angeles Airports District Office

Federal Aviation Administration
P.O. Box 92007
Los Angeles, CA 90009-2007

September 24, 2012

Mr. Scott Tatro
Environmental Affairs Officer
Los Angeles World Airports
Environmental Services Division
1 World Way, P.O. Box 92216
Los Angeles, CA 90009

Dear Mr. Tatro:

Los Angeles International Airport
Forecasts of Aircraft Operations at LAX – 2013 and 2018

The Federal Aviation Administration has reviewed the Part 161 Draft Working Paper entitled *Forecasts of Aircraft Operations at LAX – 2013 and 2018* dated August 1, 2012. We approve the use of those forecasts for your proposed Part 161 Study.

We compared your 2018 operations forecast to the Federal Aviation Administration (FAA) 2011 Terminal Area Forecast (TAF) which we published in January 2012. Your commercial and total operations forecasts for 2018 are within 10% of the TAF, which is our standard for determining TAF consistency at the 5-year point. We also reviewed other FAA data sources and find good consistency with the operations and shares projected for 2013 by market segment and aircraft type as reflected in Exhibits 3, 4, 5 and 6 of your forecast. We also consider the growth projections reflected in Section 3.0 of your forecast to be reasonable.

If you have any additional questions, please contact Richard Dykas, Regional Capacity Officer at (310) 725-3613 or Richard.Dykas@faa.gov.

Sincerely,

Victor Globa
Environmental Protection Specialist

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