## Appendix F LAX SPECIFIC PLAN AMENDMENT STUDY REPORT

# **Operational Analysis**

July 2012

Prepared for:

Los Angeles World Airports One World Way Los Angeles, California 90045

Prepared by:

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## Appendix F-1 LAX SPECIFIC PLAN AMENDMENT STUDY REPORT

# LAX 2009-2025 Passenger Forecast and Design Day Flight Schedule Development

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# 1. OVERVIEW

This passenger activity forecast (herein referred to as the LAX Passenger Forecast) was prepared to evaluate passenger activity that may be projected to occur under the alternative airfield and terminal configurations at the Los Angeles International Airport (LAX) analyzed in the Specific Plan Amendment Study (SPAS) (the Project) from Baseline Year 2009 through Plan Year 2025. **Section 2** of this report presents the methodology, assumptions and development process used to prepare the LAX Passenger Forecast.

**Sections 3** and **4** of this report presents the assumptions, methodology and results related to the development of two design day flight schedules (DDFSs) prepared in support of the Project, as follows:

- The 2009 DDFS represents existing activity levels for a peak month average day (PMAD) in 2009 (the baseline year). In accordance with the provisions of the California Environmental Quality Act (CEQA), October 2010 is the baseline date for characterizing existing conditions in the SPAS EIR. For the analysis of airfield operations, a full year's worth of data was considered necessary and appropriate to characterize existing baseline conditions. Airport operations data for the prior calendar year, which for purposes of the SPAS analysis is 2009, were used to define existing baseline conditions related to airfield operations.
- The 2025 DDFS represents forecasted activity levels for a PMAD in 2025 (the forecast year). The number of scheduled passenger operations was derived from the forecasted passenger activity levels presented in the LAX Passenger Forecast. The number of non-scheduled operations (non-scheduled passenger, non-scheduled air taxi (AT), general aviation (GA), cargo and military operations) was derived from projections of unscheduled activity for 2025.

The LAX Passenger Forecast and associated DDFSs developed for the Project are based on data and assumptions made in early to mid-2010 (March through June 2010). Because future conditions are by definition unknown, future activity results may be different from those predicted in the forecast results. Development of DDFSs carries the further uncertainty of airline responses to changes in operating costs and demand. Therefore, the 2025 DDFS developed from the LAX Passenger Forecast represents a range of possible, but not necessarily actual, future aircraft activity levels.

# 2. LAX PASSENGER FORECAST

The following sections discuss the LAX Passenger Forecast development process and results.

## 2.1 The Uncertainty Related to Forecasting

Significant national and international events over the last twelve years have affected aviation activity. Of the several factors that continue to affect the industry and add uncertainty to the forecasting effort, the following are four of the most significant.

### Cost of Aviation Fuel

The volatile price of fuel is one of the most significant forces affecting the industry today. The average price of jet fuel was \$0.81 per gallon in 2000 compared with \$2.10 in 2007. In May 2008, the average price of jet fuel increased to \$3.79 per gallon. By December 2011, prices were just below \$3.00.

According to Airlines for America (A4A)<sup>1</sup>, every one-cent average annual increase in the price per gallon increases the annual airline operating expenses for the industry by approximately \$175 million. The A4A's reported airline cost index indicates that fuel is the industry's top cost (30.7) percent of industry expenditures for fuel; 22.1 percent for labor in third quarter 2011.

<sup>&</sup>lt;sup>1</sup> Airlines for America (A4A), formerly known as Air Transport Association of America, Inc. (ATA), is a trade organization of the principal U.S. airlines.

The significant increases in the price of jet fuel over the past ten years have contributed to airline capacity reductions. This puts downward pressure on activity increases through higher fares and higher flight load factors on fewer available flights.

### Economic Conditions

In addition to airline cost factors, the overall state of the economy affects the propensity to travel, and therefore airline revenue. For an international gateway airport such as LAX, this includes both domestic and international conditions. Because economic conditions are typically cyclical over time (over longer periods, average changes are more regular and predictable), trends can be extracted from the balance of strong and weak economic years. However, when combined with the unsteady growth at LAX over the last twelve years, changing economic conditions can affect the reliability of forecasts of airline activity by further reducing the correlation between the economic conditions and airport activity.

### Airport Security

The requirements and uncertainties related to airport security and the processes and procedures of the Department of Homeland Security (DHS) can affect the decision to, and the mode choice for, travel. With enactment of the Aviation and Transportation Security Act (ATSA) in November 2001, the Transportation Security Administration (TSA) was created, followed by the Homeland Security Act (which created the DHS) in November 2002. The ATSA mandates certain passenger, cargo and baggage screening requirements, security awareness programs for airport personnel, and deployment of explosive detection devices. These security requirements have increased the time required in the terminal to reach aircraft gates as well as bag check-in decisions. Wait time expectations at a particular airport may affect the travel mode choice made by the passenger.

### **Threat of Terrorism and Associated Uncertainty**

As has been the case since September 11, 2001, terrorism incidents directed against either domestic or international aviation, or against other targets that directly affect aviation, contribute to the uncertainty of achieving activity projections. An increase in terrorist activity produces a disincentive for passengers to travel because of the perceived additional risk, as well as the additional security screening procedures discussed above. Therefore, any terrorist incident aimed at aviation during the forecast period of this study could immediately and significantly affect demand for aviation services.

The cost of aviation fuel, unpredictable economic conditions, increasing airport security measures, and threats of terrorism can and may affect the assumptions and results of this LAX Passenger Forecast. Given how these circumstances, along with other unforeseen airline business decisions, can also affect forecast variables, the LAX Passenger Forecast indicates possible rather than predictable results. These airline business decisions may include starting or stopping service to different markets; changes in aircraft fleets; and growth or reduction of capacity at LAX.

As noted in the LAX Senior Revenue Bonds 2008 Series Report, "despite current uncertainties facing the aviation industry today, it is expected that in the long term the Airport will maintain its role as one of the premier airports worldwide, both in service to domestic O&D [Origin & Destination] passengers and as an international gateway. Given the strength of its economic base and leading socioeconomic indicators, the Los Angeles CSA [Combined Statistical Area] will support long-term growth in passenger demand, with regional demand continuing to be predominantly served at the Airport, including international travel and nonstop travel to major medium and long-haul markets."<sup>2</sup>

<sup>&</sup>lt;sup>2</sup> Ricondo & Associates, Inc., Los Angeles International Airport Senior Revenue Bonds, 2008 Series A Senior Refunding Revenue Bonds, 2008 Series B Subordinate Revenue Bonds, 2008 Series C - Appendix A: Report of the Airport Consultant, July 2008.

## 2.2 Background Information

The following sections present a summary of historical data and an analysis of passenger activity at LAX.

## 2.2.1 Passenger Activity

Of the top five U.S. airports with the largest total passengers in 2010, LAX ranks third with 59,069,409 passengers—ahead of Dallas Fort-Worth International and Denver International airports—and behind Hartsfield-Jackson Atlanta International and Chicago O'Hare International airports.

As presented in **Table 1**, over the last 10 years, LAX has experienced significant shifts in passenger activity. Historically, domestic enplanements have represented between 72 and 75 percent of all enplanements at LAX. In addition to compounded annual growth rates (CAGR), i.e., the year-over-year growth rates over a specified period of time, Table 1 presents year-to-year growth percentages to depict variations in enplanements from one year to the next.

### **Domestic Enplanements**

Domestic enplanements at LAX increased from approximately 23.7 million enplaned passengers in Fiscal Year (FY) 1999 to approximately 25.0 million in FY 2001. This increase represents a CAGR of 2.5 percent during this period, compared with 1.2 percent nationwide. Domestic enplaned passengers at LAX decreased 16.7 percent between FY 2001 and FY 2002, compared to a nationwide activity decrease of 8.1 percent. Thereafter, domestic enplanements at LAX increased at a CAGR of 1.3 percent between FY 2002 and FY 2008, reaching approximately 22.4 million in FY 2008, compared with a 2.8 percent annual growth nationwide during this same 2002-2008 period. Between 2008 and 2009, the number of LAX enplanements decreased by 7.9 percent, reaching approximately 20.6 million enplanements.

### International Enplanements

Table 1 also presents historical data on international enplaned passengers at LAX between FY 1999 and FY 2009. International passenger activity at LAX increased from approximately 7.7 million enplanements in FY 1999 to approximately 8.9 million in FY 2001, a CAGR of 7.0 percent. International enplanements decreased from approximately 8.9 million in FY 2001 to approximately 7.3 million in FY 2002 (a CAGR of 17.2 percent). Thereafter, between 2002 and 2008, international passenger activity began to recover, with enplaned passengers increasing at a CAGR of 2.9 percent, reaching approximately 8.7 million in FY 2008 before decreasing to approximately 7.7 million in FY 2009.

### Total Enplanements

Commensurate to the increases and decreases in domestic and international enplanements described above, total LAX enplanements fluctuated over the period of 1999 to 2009, decreasing at a CAGR of 1.1 percent. In comparison, U.S. enplanements increased at a CAGR of 0.3 percent over the same period of 1999 to 2009.

### LAX Share of U.S. Domestic Enplanements

As depicted in Table 1, LAX share of U.S. domestic enplaned passengers slowly decreased between FY 2001 and FY 2005, settling at approximately 3.3 percent between 2006 and 2009.

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Domestic and International Enplaned Passengers

		International Activity		Total Act	ivity				
Fiscal Year	LAX Enplanements <sup>1/</sup>	LAX Annual Growth	U.S. Enplanements <sup>2/</sup>	U.S. Annual Growth	LAX Share of U.S. Enplanements	LAX Enplanements 1/	Annual Growth	LAX Enplanements 1/	Annual Growth
1999	23,736,102	3.0%	610,900,000	3.5%	3.9%	7,749,359	0.9%	31,485,461	2.4%
2000	24,880,727	4.8%	641,200,000	5.0%	3.9%	8,350,995	7.8%	33,231,722	5.5%
2001	24,960,755	0.3%	625,800,000	-2.4%	4.0%	8,879,214	6.3%	33,839,969	1.8%
2002	20,783,817	-16.7%	575,100,000	-8.1%	3.6%	7,347,844	-17.2%	28,131,661	-16.9%
2003	20,441,104	-1.6%	587,800,000	2.2%	3.5%	7,269,224	-1.1%	27,710,328	-1.5%
2004	21,241,860	3.9%	628,500,000	6.9%	3.4%	7,837,987	7.8%	29,079,847	4.9%
2005	22,143,442	4.2%	669,400,000	6.5%	3.3%	8,404,809	7.2%	30,548,251	5.0%
2006	22,030,697	-0.5%	668,400,000	-0.1%	3.3%	8,624,449	2.6%	30,655,146	0.3%
2007	22,374,333	1.6%	690,100,000	3.2%	3.2%	8,429,137	-2.3%	30,803,470	0.4%
2008	22,427,379	0.2%	679,600,000	-1.5%	3.3%	8,714,960	3.4%	31,142,339	1.1%
2009	20,662,550	-7.9%	626,500,000	-7.8%	3.3%	7,666,428	-12.0%	28,328,978	-9.0%
Compounded Annual Growth Rate									
1999 - 2001	2.5%		1.2%			7.0%		3.7%	
2001 - 2002	-16.7%		-8.1%			-17.2%		-16.9%	
2002 - 2008	1.3%		2.8%			2.9%		1.7%	
2008-2009	-7.9%		-7.8%			-12.0%		-9.0%	
1999-2009	-1.4%		0.3%			-0.1%		-1.1%	

#### Notes:

<sup>1/</sup> Twelve months ending June 30.

<sup>2/</sup> Twelve months ending September 30.

<sup>3/</sup> Estimated by the FAA.

Source: Los Angeles World Airports (Airport activity); Federal Aviation Administration Data & Statistics Reports (U.S. activity), June 2009. Prepared by: Ricondo & Associates, Inc., February 2012.

### Appendix F-1 – LAX 2009-2025 Passenger Forecast and Design Day Flight Schedule Development

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As a primary U.S. gateway with substantial domestic air service, the percentage of connecting passenger traffic at LAX is relatively high for an airport where no airline dominates activity. LAX connecting domestic activity has fluctuated around the 30 percent range as presented in **Table 2**. As data on the ratio of international passengers connecting at LAX is limited, the following data focuses on domestic connecting passengers.

Several factors contribute to this connecting activity:

- LAX role as a major gateway to international markets,
- The advantageous geographical location of LAX in relation to markets along the West Coast corridor,
- The significant number of nonstop flights each day to and from domestic markets, and
- The alliances among airlines serving LAX that foster connecting activity through alliance-related ticket pricing and marketing.

#### Table 2

Percentage of Do	mestic O&D Passe	engers			
Calendar Year	LAX Domestic O&D Passengers	LAX Domestic Enplaned and Deplaned Passengers	LAX O&D Percentage	LAX Domestic Connecting Passengers	LAX Connecting Percentage
1999	33,273,400	48,464,655	68.7%	15,191,255	31.3%
2000	33,451,650	49,887,433	67.1%	16,435,783	32.9%
2001	30,601,960	45,656,025	67.0%	15,054,065	33.0%
2002	27,785,620	41,379,168	67.1%	13,593,548	32.9%
2003	28,012,880	40,358,935	69.4%	12,346,055	30.6%
2004	30,955,430	44,220,019	70.0%	13,264,589	30.0%
2005	31,200,070	44,003,135	70.9%	12,803,065	29.1%
2006	31,031,850	44,129,974	70.3%	13,098,124	29.7%
2007	31,453,800	44,732,810	70.3%	13,279,010	29.7%
2008	31,309,500	45,190,615	69.3%	13,881,115	30.7%
2009 Compounded Annual Growth Rates	29,115,070	41,393,269	70.3%	12,278,199	29.7%
1999 - 2001	-4.0%	-2.9%		-0.4%	
2001 - 2002	-9.2%	-9.4%		-9.7%	
2002 - 2008	2.0%	1.5%		0.3%	
2008 - 2009	-7.0%	-8.4%		-11.5%	

Source: Los Angeles World Airports (Airport activity); Federal Aviation Administration Data & Statistics Reports (U.S. activity), June 2009. Prepared by: Ricondo & Associates, Inc., February 2012.

## 2.2.2 Aircraft Operations

The total for aircraft operations at LAX has fluctuated over the past decade due, in part, to factors affecting the entire aviation industry. **Table 3** presents historical operations (take-offs and landings) at LAX by major user group between FY 1999 and FY 2009.

Total aircraft activity at LAX increased from 762,828 operations in FY 1999 to 796,129 operations in FY 2001, a CAGR of 2.2 percent, compared with a compounded decrease of 1.3 percent nationwide. With the effects of September 11, 2001, total aircraft activity at LAX steadily decreased the next few years—from 796,129 operations in FY 2001 to 636,687 in FY 2004, a CAGR of 7.2 percent. Contributing to this decrease were an economic slowdown and the subsequent reduced activity by passengers and all-cargo carriers at LAX. Thereafter, total operations increased at a compounded annual growth rate of 1.4 percent between FY 2004 and FY 2007, reaching 663,509 operations in FY 2007. Operations in 2008 increased by 2.5 percent, followed by a 17.3 percent drop in 2009 to 561,989, caused primarily by a 14.3 percent decrease in passenger airline operations.

T	able	3

Annual Airport Operations by Type								
Fiscal Year	U.S. Carriers	Foreign Flag Carriers	Airline Total	General Aviation	All Cargo	Other Air Taxi	Military	Total
1999	624,110	70,376	694,486	18,430	33,918	13,330	2,664	762,828
2000	633,404	74,516	707,920	18,292	36,756	16,388	2,552	781,908
2001	647,792	78,744	726,536	17,787	36,110	13,728	1,968	796,129
2002	528,750	66,650	595,400	15,188	31,694	12,818	2,315	657,415
2003	506,940	71,834	578,774	16,379	25,834	18,208	2,239	641,434
2004	496,712	74,376	571,088	14,709	25,344	22,740	2,806	636,687
2005	506,418	80,808	587,226	14,040	27,100	22,605	2,852	653,823
2006	498,930	81,476	580,406	16,116	26,272	25,582	2,488	650,864
2007	510,210	74,918	585,128	15,624	25,232	35,037	2,488	663,509
2008	526,662	80,706	607,368	18,239	22,530	28,886	2,758	679,781
2009	447,370	73,044	520,414	15,758	19,414	3,842	2,561	561,989
Compounded Annual Growth Rate								
1999 - 2001	1.9%	5.8%	2.3%	-1.8%	3.2%	1.5%	-14.1%	2.2%
2001 - 2004	-8.5%	-1.9%	-7.7%	-6.1%	-11.1%	18.3%	12.6%	-7.2%
2004 - 2007	0.9%	0.2%	0.8%	2.0%	-0.1%	15.5%	-3.9%	1.4%
2007 - 2008	3.2%	7.7%	3.8%	16.7%	-10.7%	-17.6%	10.9%	2.5%
2008 - 2009	-15.1%	-9.5%	-14.3%	-13.6%	-13.8%	-86.7%	-7.1%	-17.3%

Source: Los Angeles World Airports, June 2009.

Prepared by: Ricondo & Associates, Inc., February 2012.

## 2.2.3 Existing Aviation Forecasts

Developing the LAX Passenger Forecast included reviewing existing aviation forecasts for LAX and the Los Angeles metropolitan area developed by the Federal Aviation Administration (FAA), LAWA, and the Southern California Association of Governments (SCAG) to assess consistency in both the forecasting process and the proposed LAX Passenger Forecast. Four key forecasts are discussed below.

### The Southern California Association of Governments Regional Forecast

When development of this LAX Passenger Forecast was initiated, the 2008 Regional Transportation Plan (RTP) and its Aviation and Airport Ground Access Report, was the latest RTP available. SCAG's

Regional Aviation Demand Allocation Model (RADAM) was updated in 2008 to include updated assumptions about the impact of security screening at airports as well as the effects of rising fuel costs.

The 2008 RTP assessed three different scenarios with a planning horizon of 2035 for the entire SCAG region, which includes all airports in Imperial, Los Angeles, Orange, Riverside, San Bernardino and Ventura counties. It also anticipates SCAG Region airports capturing some demand from San Diego County. The unconstrained forecast scenario yielded a CAGR of 3.93 percent between 2005 and 2035 for the Southern California region. Both the SCAG Constrained and Preferred scenarios stabilized LAX growth at 78.9 million annual passengers.<sup>3</sup>

Based on the now adopted 2012-2035 SCAG Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS) and the adopted Medium Growth/Baseline Growth scenario, aviation demand is forecasted to grow at a 2.5 CAGR through 2035. All scenarios studied in the 2012 RTP/SCS show LAX passenger demand at 78.9 Million Annual Passengers (MAP).

### The Federal Aviation Administration Terminal Area Forecast

The FAA's Terminal Area Forecast (TAF) is the official forecast of fiscal year aviation activity at FAA facilities (FAA towered airports, federally contracted towered airports, non-federal towered airports, and non-towered airports) for active airports in the National Plan of Integrated Airport System (NPIAS). The FAA prepares the TAF for federal budgetary and planning purposes, as well as a reference for state and local authorities, the aviation industry at large, and the general public. The TAF includes the major users of the national aviation system: air carriers, air taxi and commuter carriers (not including non-revenue passengers), GA operators, and military activity.

At the time the development of this LAX Passenger Forecast was initiated, the 2009 TAF (published December 2009) was the most recent TAF available. It projected LAX enplanements to grow at a CAGR of 2.8 percent between 2009 and 2025, reaching approximately 43.5 million enplanements (approximately 87 million total passengers) in 2025.

The FAA revises the TAF annually, and since December 2009, the projected CAGR has fluctuated, with the most recent projection being lower than the December 2009 projection. Specifically, the 2010 TAF for LAX projected LAX enplanements to grow at a 3.5 percent CAGR between 2010 and 2025, reaching approximately 47.0 million enplanements (approximately 94 million total passengers) in 2025. The 2011 LAX TAF reduced these results to a 2.5 percent CAGR between 2011 and 2025, reaching approximately 41.6 million enplanements (approximately 83.2 million total passengers) in 2025.

### LAX Financial Feasibility Forecast

Financial feasibility forecasts supporting the LAX Senior Revenue Bonds, 2009 Series A Senior Revenue Bonds, 2009 Series C and D Subordinate Revenue Bonds, and 2009 Series E Subordinate Refunding Revenue Bonds were submitted to the LAWA Board of Airport Commissioners in October 2009. The financial feasibility forecast was intended to be "conservative," leading to projections of activity that are reasonably probable for evaluating the Airport's financial health and ability to repay new bond debt service.

The Financial Feasibility forecast effort focused on two forecasting models: (1) regression analysis based on recent annual passenger activity and regional socioeconomic statistics, and (2) national market share and growth rate for LAX. The resulting regression correlation was judged too low to be reliable, and therefore was not used as the basis for the Financial Feasibility forecasts. A 2.2 percent annual enplanement growth rate (1.6 percent domestic; 2.9 percent international) for the period 2010 through 2016 was adopted as reasonable and conservative results in the Financial Feasibility forecast analysis.

<sup>&</sup>lt;sup>3</sup> Source: Southern California Association of Governments, 2012-2035 Regional Transportation Plan/Sustainable Communities Strategy, Chapter 2 "Transportation Investments", p. 58, April 2012.

### LAX Master Plan Forecast

The LAX Master Plan passenger forecast, developed in 1995, projected total passenger demand reaching 98 million passengers in 2015. The Master Plan projected average annual growth rates over three 5-year periods: 2000-2005 (3.6 percent); 2005-2010 (2.9 percent); and 2010-2015 (2.7 percent). The Master Plan forecasts were based on the relatively consistent growth years of 1970 to 1994. Because the Master Plan did not produce forecasted passengers beyond 2015, and for comparison purposes, the Master Plan forecast growth rate for the period of 2010 to 2015 of 2.7 percent was applied to the base year (actual) of 2009. With the 2.7 percent kept constant through 2025, the calculation yields passenger activity of approximately 86.5 million total passengers in 2025.

The LAX Master Plan forecast process was a multi-level analysis, addressing individual components of LAX activity using analytic and comparative approaches depending on the type of data available and the confidence levels of the results. Regression analysis was one of the primary tools used in that analysis.

## 2.3 LAX Passenger Forecast Assumptions

The following assumptions were used to develop the LAX Passenger Forecast. These assumptions include both qualitative and quantitative considerations that set up a framework for developing the LAX Passenger Forecast.

- For the analysis of airfield operations, a full year's worth of data was considered necessary and appropriate to characterize existing baseline conditions. Airport operations data for the prior calendar year, which for purposes of the SPAS analysis is 2009, were used to define existing baseline conditions related to airfield operations.
- The stability and/or general relationship of airline fuel costs with respect to other costs and revenue factors is unknown over the longer term. This study assumed fuel costs would not disproportionately affect airline costs or fares to the extent that demand would not be overly depressed because of fuel costs.
- The percentage of capacity provided by low cost carriers has increased significantly at airports in the Los Angeles area in recent years. These are primarily narrowbody domestic service carriers and can serve any of the regional commercial service airports. Their choice of which airports to serve could affect growth at LAX. This study assumed that the LAX share of the region's low cost airline activity will remain relatively constant over the term of the forecast.
- As Open Skies and more liberal bi-lateral agreements are finalized, U.S. Flag and Foreign Flag carriers will have more flexibility to fly both to LAX and beyond LAX with non-stop service to inland airports. This will be aided by increased range capabilities for new aircraft currently in engineering design or production.
- The various activity limits at some of the region's airports, such John Wayne and Long Beach airports, can be expected to displace traffic growth to other regional commercial service airports, including LAX. These limits, however, can also encourage airlines to increase service to capture market share before capacity is reached, or alternately, encourage airlines to add service at airports where growth is not constrained. For this study, these effects were assumed to be neutral with respect to LAX.
- FAA's activity forecasts are based on revenue passengers only. However, the LAX Passenger Forecast was set to include non-revenue passengers.
- Recent annual activity was reviewed to identify trends in the domestic and international shares of the total annual passengers. The ratio of international to total passengers have held relatively steady in the approximate 25 percent to 28 percent range between 1999 and 2009. The average international share in this period was approximately 27 percent; however, in the past five years it has remained in the 27 percent to 28 percent range. Based on this information, a slow decrease per year in domestic share and a slow increase in international share were assumed, leading to a 28 percent international, 72 percent domestic ratio assumed in 2025.

Overall, the LAX total domestic O&D passengers in 2009 made up approximately 70 percent of total domestic passengers with the remaining 30 percent of passengers using LAX as a connection point. Due to limited and restricted data, the international O&D percentage was derived from calculations using passenger statistics based on a mix of U.S. DOT and LAWA data, which indicate that 89 percent of international passengers originate or terminate their trip at LAX, while 11 percent connect to other international or domestic flights. This O&D percent was assumed to be increased by 0.3 percent per year through the forecast period to reflect the increase in international gateways.

## 2.4 Forecast Development Methodology

One of the methodologies considered for the LAX Passenger Forecast was a regression analysis approach. A regression analysis is a traditional model used for aviation forecasts, with single and multiple variable regressions calculated based on historical enplanements and regional socio-economic conditions. Following the results of the Financial Feasibility analysis discussed in the previous section, it was determined that the use of a regression analysis approach for the LAX Passenger Forecast would not produce acceptable and reliable results due to the relatively wide fluctuation in activity from the 1990s through 2009—notably the substantial capacity and passenger increases in the late 1990s; the significant drop after 2001; and again in 2008 and 2009.

Projecting future years based on the activity trend of the last ten years would indicate future decreases in activity to uncharacteristically low levels for a major international gateway and population center such as the Los Angeles region.

Instead of a regression analysis or a trend approach, a market share approach was used to develop the LAX Passenger Forecast. This approach compared recent LAX passenger activity with the FAA U.S. Aerospace Forecasts. Over the past ten years, LAX share of national activity has slowly decreased, settling in the past three years at approximately 3.55 percent annually. With reliable forecast data readily available from the FAA for 2025, the forecasted number of passengers at LAX for 2025 was calculated based on this 3.55 percent share of the U.S. activity. The following section presents the results of the LAX Passenger Forecast.

## 2.5 LAX Passenger Forecast Results

The LAX Passenger Forecast resulted in a 2.3 percent annual increase in passenger (CAGR) through 2025. Based on this forecast growth rate, the total number of annual passengers reaches 78.9 MAP in 2024. Relative to the LAX Passenger Forecast, the number of passengers was maintained at 78.9 MAP in 2025, which is consistent with the adopted 2012 RTP that has LAX at 78.9 MAP in the future. It also reflects the fact that all of the SPAS alternatives include (i) no more than 153 gates and (ii) the amendment of LAX Specific Plan section 7.H requiring action to encourage further shifts in passenger and airline activity to other regional airports if the annual aviation activity analysis forecasts that the annual passengers for that year at LAX are anticipated to exceed 75 MAP, and, by requiring a Specific Plan Amendment Study if the annual aviation activity analysis forecasts that LAX annual passengers for that year are anticipated to exceed 78.9 MAP.

 Table 4 presents the year-by-year projections for domestic, international and total passengers through 2025.

To place the LAX Passenger Forecast results in perspective with the other LAX forecasts discussed in previous sections, **Figure 1** depicts the LAX Passenger Forecast along with the 2009 and 2011 FAA TAF, the Master Plan growth rates from a 2009 base, and the 2009 Financial Feasibility results.

Here are some of the main differences between these forecasts and the LAX Passenger Forecast:

• The 2009 LAX Financial Feasibility Senior Revenue Bonds forecast provides a 2.2 percent growth rate through 2016, slightly below the LAX Passenger Forecast.

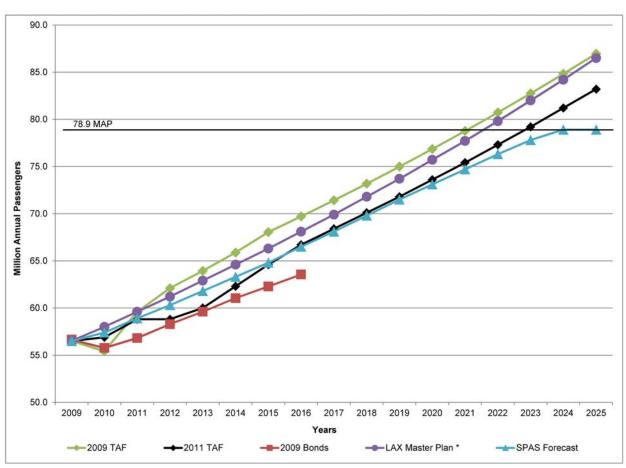
- The 2009 TAF growth rate of approximately 2.7 percent annually (CAGR) translates into approximately 86.5 MAP in 2025.
- The 2011 TAF growth rate of approximately 2.5 percent annual (CAGR) translates into approximately 83.22 MAP in 2025.
- The LAX Master Plan projected a CAGR of 2.7 percent between 2010 and 2015. If this growth rate
  was applied to the 2009 base year activity levels through 2025, projections would reach
  approximately 86.5 MAP in 2025.

Years	Domestic	Percentage of Total	International	Percentage of Total	Total Passengers
2009	41.4	73.3%	15.1	26.7%	56.5
2010	42.1	73.3%	15.3	26.7%	57.4
2011	43.1	73.2%	15.8	26.8%	58.9
2012	44.1	73.1%	16.2	26.9%	60.3
2013	45.2	73.1%	16.7	26.9%	61.8
2014	46.2	73.0%	17.1	27.0%	63.3
2015	47.2	72.9%	17.6	27.1%	64.8
2016	48.4	72.8%	18.1	27.2%	66.5
2017	49.5	72.7%	18.6	27.3%	68.1
2018	50.7	72.6%	19.1	27.4%	69.8
2019	51.8	72.5%	19.6	27.5%	71.5
2020	53.0	72.4%	20.2	27.6%	73.1
2021	54.1	72.4%	20.6	27.6%	74.7
2022	55.1	72.3%	21.1	27.7%	76.3
2023	56.2	72.2%	21.6	27.8%	77.8
2024	56.8	72.0%	22.1	28.0%	78.9
2025	56.8	72.0%	22.1	28.0%	78.9
CAGR I	between 2009 a	nd 2024: 2.3 percent, wit	h 78.9 MAP held	in 2025.	

LAX Passenger Forecast Results (in million annual passengers)

Source: Ricondo & Associates, Inc., February 2012.

Prepared by: Ricondo & Associates, Inc., February 2012.



LAX Passenger Forecast Results and Comparison to Other Aviation Forecasts

\* LAX Master Plan forecasted growth rate of 2.7 percent applied linearly from 2009 through 2025.

Sources: Ricondo & Associates, Inc., May 2012. Prepared by: Ricondo & Associates, Inc., May 2012.

Figure 1

# 3. 2009 DESIGN DAY FLIGHT SCHEDULE

2009 serves as a baseline year for the development of the DDFS for LAX. The following sections present the steps taken to develop the 2009 DDFS, including data sources, assumptions, methodology, and the results of the flight schedule development process.

## 3.1 Data Sources and Assumptions

The following data sources were used in the development of the baseline 2009 DDFS:

 Published Official Airline Guide (OAG) schedule for August 2009, which included information on published carrier, operator, aircraft type, seat capacity, origin/destination, flight number, and time of arrival/departure.

- LAX radar flight data for the third quarter of 2009 was obtained from the LAWA's Environmental Services Division, Noise Office in order to develop the non-scheduled activity component of the 2009 DDFS (non-scheduled passenger, non-scheduled air taxi, cargo, GA and military operations).
- U.S. Department of Transportation (U.S. DOT) T100 Database. The U.S. DOT T100 database for reporting air carrier traffic and capacity data was used to populate the 2009 passenger counts on an airline/market basis and compute resulting load factors.

The following assumptions were made to prepare the 2009 DDFS:

- <u>Peak month average day</u>: August 2009 was the month with the highest number of operations recorded in 2009. August 18, 2009 was selected as a representative average day in the peak month of August based on its number of total aircraft operations performed on that day. Therefore, the number of operations recorded on this date is representative of the average number of daily operations that occurred at LAX in August 2009.
- <u>Passenger volumes</u>: passenger volumes were calculated based on the aircraft seat capacity and the assumed load factors (for scheduled passenger activity).
- <u>City pairs</u>: regions, markets and city pairs served in 2009 were included in the published OAG schedule for Tuesday, August 18, 2009 (scheduled passenger activity) and in the radar flight dataset for the third quarter of 2009 (non-scheduled activity).
- <u>Aircraft fleet mix</u>: for scheduled passenger activity, the 2009 DDFS is based on the aircraft fleet mix contained in the published OAG schedule for Tuesday, August 18, 2009. For non-scheduled activity, the 2009 DDFS is based on the aircraft fleet mix contained in the radar flight dataset for the third quarter of 2009.
- <u>Time of operation</u>: for scheduled passenger activity, arrival and departure times were included in the published OAG schedule for Tuesday, August 18, 2009. For non-scheduled activity, arrival and departure times were included in the radar flight dataset for the third quarter of 2009.
- <u>Aircraft seat capacity</u>: the number of seats assumed on each aircraft was included in the published OAG schedule for Tuesday, August 18, 2009 (for scheduled passenger activity).
- <u>Assumed load factor</u>: load factors were derived from the U.S. DOT T100 database for the month of August 2009 (for scheduled passenger activity).

# 3.2 Methodology and Results

The 2009 DDFS was developed to represent a schedule of aircraft movements and passenger traffic distribution throughout the 24 hours of a PMAD at LAX. The following sections describe the methodology used to prepare the 2009 DDFS.

### Identify the 2009 PMAD Day and Number of Operations

Typically, the design day activity level is defined to correspond to that experienced on the average day of the peak month. The peak activity month is identified from monthly operations data for the baseline year. The average day is derived by dividing the peak month activity by the number of days in that month. This approach defines a reasonably peaked condition for programmatic planning purposes.

Based on the monthly numbers of total aircraft operations, August 2009 was identified as the peak month of the year, representing 8.9 percent of the total operations in 2009. In comparison, August's passenger activity represented 9.6 percent of the total passengers in 2009, ranking second after the month of July 2009 which represented 9.9 percent of the total operations in 2009.

**Table 5** presents the calculated numbers of 2009 PMAD operations by each aircraft category as defined by the FAA: air carrier, air taxi, GA and military.

Calculation of 2009 Peak Me	onth Average D	Day Operation	s FAA Aircraft	Category	
		FAA	Aircraft Categor	ies <sup>1/</sup>	
			General		
	Air Carrier	Air Taxi	Aviation	Military	Totals
August 2009	39,571	7,216	1,416	245	48,448
PMAD (August 2009 divided by 31 days)	1,276	233	46	8	1,563

Notes:

1/

Air Carrier—an aircraft with seating capacity of more than 60 seats or a maximum payload capacity of more than 18,000 pounds carrying passengers or cargo for hire or compensation; Air Taxi—an aircraft designed to have a maximum seating capacity of 60 seats or fewer or a maximum payload capacity of 18,000 pounds or less carrying passengers or cargo for hire or compensation; GA—takeoffs and landings of all civil aircraft, except those classified as air carriers or air taxis; and Military—all classes of military takeoffs and landings at FAA facilities.

Sources: Federal Aviation Administration, Aviation System Performance Metrics, Glossary of Terms;

http://aspmhelp.faa.gov/index.php/Glossary (accessed July 15, 2010); Federal Aviation Administration, Air Traffic Activity System, July 2010 (operations for August 2009 by aircraft category); Ricondo & Associates, Inc., July 2010 (calculated peak month average day operations).

Prepared by: Ricondo & Associates, Inc., May 2012.

### Scheduled-Passenger Activity Data

In order to gather information on scheduled-passenger activity, an OAG schedule for August 18, 2009 was acquired. The OAG schedule provided data on the published carrier, operator, aircraft type, seat capacity, origin/destination, flight number, and time of arrival/departure for each scheduled-passenger operation.

### Non-Scheduled Activity Data

In order to develop the non-scheduled activity portion of the 2009 DDFS, a radar flight dataset was provided by LAWA's Environmental Services Division, Noise Office. The radar flight dataset for the third quarter of 2009 (which included August 2009) provided data on carrier, aircraft type, tail number, origin/destination, flight number, and time of arrival/departure. The non-scheduled air carrier, air taxi, cargo, GA, and military flights in the radar flight dataset were identified and reconciled to match the PMAD operations identified in Table 5. Note that because these operations are non-scheduled operations, no matching of arrivals with departures was needed, as opposed to matching the scheduled-passenger arrivals and departures in order to be assigned to the terminal gates.

#### **Scheduled-Passenger Arrivals and Departures**

The scheduled-passenger arrival flights (included in the August 18, 2009 published OAG schedule) were matched with the departure flights. The matches were guided by a "first-in, first-out" goal, by airline and aircraft type, and after typical ground (or gate turn) times were applied. Algorithms were used to produce the most efficient arrival and departure matches based on assumed minimum gate turn times for each aircraft type and/or air carrier. Typical minimum gate turn times are 30 minutes for regional jet/propeller aircraft, 45 minutes for narrow-body aircraft, and 60 minutes for wide-body aircraft. To reflect actual air carriers' practices, exceptions were made on an individual basis. For instance, Southwest Airlines' typical practice of using 20-minute minimum gate turn time was used in matching Southwest Airlines' arriving and departing flights.

When a reasonable match could not be found in the list of arrivals and departures, towing operations were created. Aircraft were coded as "tows" and were codified as being towed either after arrival or

before departure, as opposed to being designated as "through flights" continuing on to specific destinations. Minimum targeted tow times were identified for each Airplane Design Group (ADG):

- After arrival: 30 minutes for ADG I & II aircraft; 30 minutes for ADG III aircraft; 45 minutes for ADG IV aircraft; 60 minutes for V aircraft; and 90 minutes for ADG VI aircraft.
- Before departure: 30 minutes for ADG I & II aircraft; 45 minutes for ADG III aircraft; 45 minutes for ADG IV aircraft; 60 minutes for V aircraft; and 90 minutes for ADG VI aircraft.

### 2009 DDFS Passenger Volumes

The published OAG does not provide passenger volumes. A reliable source for passenger volumes is the U.S. DOT T100 database. However, the T100 database only includes monthly passenger data, as opposed to daily numbers. In order to identify the numbers of passengers on each flight in the 2009 DDFS, average load factors were calculated using the T100 database for August 2009 based on:

- the air carriers that operated the aircraft,
- the markets that were served, and
- the types of aircraft flown.

For instance, the average load factor was calculated for an American Airlines flight arriving from Chicago's O'Hare International Airport, operated on a Boeing 737-800. This load factor was then applied to all similar flights in the 2009 DDFS.

### Final 2009 DDFS

Both sets of scheduled-passenger and non-scheduled operations were then assembled into one DDFS file. For the purposes of this analysis, the DDFS operations were categorized slightly differently than the traditional FAA's aircraft categorization. For the purposes of the gating analysis, it is helpful to group all scheduled-passenger air carrier and air taxi operations together, as these operations would be gated at passenger terminal contact and remote gates. On the other hand, the non-scheduled passenger (both air carrier and air taxi), cargo, GA and military operations are not assigned specific gates, but rather parking areas.

**Table 6** presents the 2009 DDFS operations by categories of operation. **Table 7** presents summary statistics for the 2009 DDFS operations by types of operations (arrivals and departures). **Table 8** presents the 2009 DDFS aircraft fleet mix by ADG. **Figure 2** depicts the 2009 DDFS rolling 60-minute distributions of operations and passengers.

#### Table 6

2009 DDFS Operations		
	Operation Categories	Number of Operations
	Scheduled Passenger Operations	1,438
	Non-Scheduled Operations	
	Cargo	58
	General Aviation	46
	Passenger	13
	Military	8
	Total Operations	1,563

Source: Ricondo & Associates, Inc., April 2011 (number of operations by operation category).

Prepared by: Ricondo & Associates, Inc., May 2012.

### Appendix F-1 – LAX 2009-2025 Passenger Forecast and Design Day Flight Schedule Development

#### Table 7

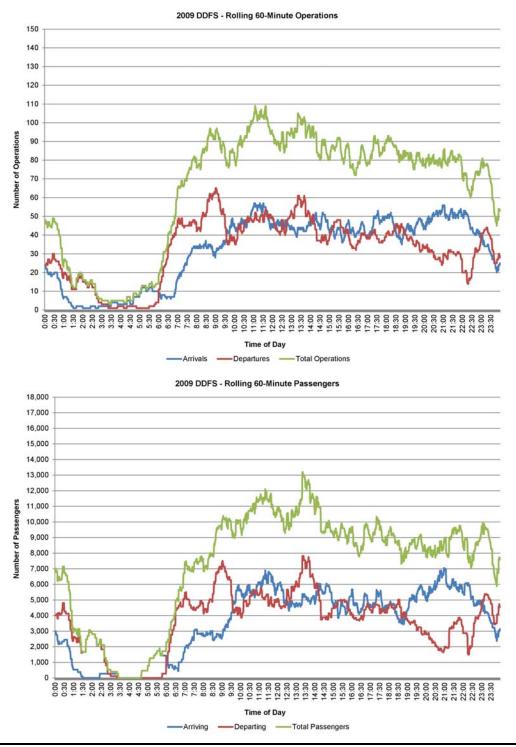
			_		Total On	arationa	
	Arrivals		Depa	artures		Total Operations	
Operations							
Domestic	643	82.6%	642	81.8%	1285	82.2%	
International	135	17.4%	143	18.2%	278	17.8%	
Total	778		785		1563		
Seats							
Domestic	76,800	74.0%	76,826	72.8%	153,626	73.4%	
International	26,922	26.0%	28,647	27.2%	55,569	26.6%	
Total	103,722		105,473		209,195		
Seats/Operation							
Domestic	119		120		120		
International	199		200		200		
Total	133		134		134		
Passengers							
Domestic	64,665	74.8%	64,702	73.7%	129,367	74.2%	
International	21,767	25.2%	23,113	26.3%	44,880	25.8%	
Total	86,432		87,815		174,247		
Average Load Factor							
Domestic		84.2%		84.2%		84.2%	
International		80.9%		80.7%		80.8%	
Total		83.3%		83.3%		83.3%	

Source: Ricondo & Associates, Inc., April 2011 (summary statistics). Prepared by: Ricondo & Associates, Inc., May 2012.

Airplane Design Group/Aircraft Families	Daily Operations	ADG Percentage of Total Operations	Percentage of ADG Operations
ADG I			
Propellers	4		40.0%
Regional Jets	6		60.0%
Total ADG I Operations	10	0.6%	
ADG II			
Propellers	128		38.6%
Regional Jets	204		61.4%
Total ADG II Operations	332	21.2%	
ADG III			
Airbus 318,319,320,321,32s	259		34.1%
Boeing 717 Series	2		0.3%
Boeing 737 Series	389		51.3%
McDonnell-Douglas 80-90 Series	54		7.1%
Propellers	24		3.2%
Regional Jets	31		4.1%
Total ADG III Operations	759	48.6%	
ADG IV			
Airbus 300-310s	8		2.6%
Boeing 757 Series	206		65.8%
Boeing 767 Series	77		24.6%
McDonnell-Douglas 80-90 Series	2		0.6%
McDonnell-Douglas DC-10 Series	11		3.5%
McDonnell-Douglas MD-11 Series	7		2.2%
Lockheed C-130	2		0.6%
Total ADG IV Operations	313	20.0%	
ADG V			
Airbus 343,345,346	22		15.0%
Boeing 747 Series	74		50.3%
Boeing 777 Series	51		34.7%
Total ADG V Operations	147	9.4%	
ADG VI			
Airbus 380	2		100.0%
Total ADG VI Operations	2	0.1%	
Grand Total	1,563	100.0%	

Source: Ricondo & Associates, Inc., April 2011 (aircraft fleet mix by ADG). Prepared by: Ricondo & Associates, Inc., May 2012.

#### Figure 2 LAX 2009 DDFS – Rolling 60-Minute Operation and Passenger Distributions



Source: Ricondo & Associates, Inc., May 2012 (operation and passenger distributions). Prepared by: Ricondo & Associates, Inc., May 2012.

# 3.3 Gating

Each scheduled-passenger flight in the 2009 DDFS was assigned a terminal gate or parking position based on the 2009 existing condition terminal and gate layout. The process of assigning gates or parking positions to flights is herein referred to as "gating". The assumptions, methodology and results related to the gating of scheduled-passenger aircraft are presented in the following sections.

# 3.3.1 Description of Terminal and Gate Layout

**Figure A** in **Attachment A** depicts the terminal and gate layout assumed under the 2009 conditions. The layout includes the Central Terminal Area (CTA) terminals (Terminals 1 through 8), Tom Bradley International Terminal (TBIT), the West Gates, the American Eagle Commuter Terminal, and the remote United Express commuter gates. 159 gates were assumed in use to gate the 2009 DDFS.

## 3.3.2 Assumptions

The following assumptions were used to gate the 2009 DDFS:

- Airline assignments, as well as common and/or shared gate use rules, were followed.
- TBIT procedures were followed as it related to towing aircraft off a gate after 90 minutes for widebody aircraft.
- ADG VI operations were accommodated at TBIT (rather than at the West Gates) to maximize passenger level of service.
- As an industry standard to reflect common airline practices, a minimum gate rest time of 15 minutes between a departure and the next arrival at a gate was maintained.
- Typical gating practices, such as segmented pushbacks, were assumed.

# 3.3.3 Methodology and Results

The gating model is based on algorithms, logic statements, and an iterative process which assigns flights to gates starting with the first flight in the DDFS. Through iterations, the gating model seeks to maximize the use of each gate by ensuring that a large aircraft takes precedent over smaller aircraft. Each gate is codified based on a nominal gate size (i.e., the size of a specific aircraft type which is the largest aircraft that can be accommodated at the gate). At LAX, and as depicted on Figure A, certain gates are designed to be dependent on adjacent gate(s). Gate dependencies can exist when parking a large aircraft than particular gate requires that the adjacent gate(s) either be closed or accommodate a smaller aircraft than the nominal gate size would allow.

Based on the gating assumptions, the gating model was set up to accommodate all airlines and aircraft types included in the DDFS.

Under the 2009 conditions, aircraft were assigned to specific terminals and gates based on airline assignments in effect in the summer 2009, as presented in **Table 9**.

Each aircraft included in the 2009 DDFS was assigned a gate or parking position. There were an adequate number of gates and aircraft positions in 2009 to accommodate all scheduled-passenger flights. The results of the gating exercise are illustrated on the 2009 conditions ramp chart included in **Attachment B**. **Table 10** presents the average numbers of turns per gate calculated based on the results of the gating exercise. In 2009, the average number of turns per gate airport wide was 4.5 turns.

2009 Conditions – Airline Terminal Assignments

Terminals	Airlines					
T1	Southwest Airlines, US Airways					
Τ2	Aeromexico; Air Canada; Air China; Air France; Air New Zealand; Alitalia; Avianca Airlines; Hawaiian Airlines; KLM Royal Dutch Airlines; LACSA Airlines; Sun Country; TACA International Airlines; Virgin Atlantic; Volaris; West Jet					
Т3	Alaska Airlines; Horizon Air; V Australia; Virgin America					
T4	American Airlines, Qantas					
Т5	Aerolitoral; Delta Air Lines; Northwest Airlines					
Т6	AirTran Airways; Allegiant Air; Continental Airlines; Copa Airlines; Frontier Airlines; JetBlue; Midwest Airlines; Spirit Airlines					
Τ7	United Airlines					
Т8	United Airlines; United Express					
American Eagle	American Eagle					
TBIT	Aeroflot; Air Pacific; Air Tahiti Nui; Alaska Airlines (international arrivals); All Nippon Airways; Asiana Airlines; British Airways; Cathay Pacific Airways; China Airlines; China Eastern; China Southern; Copa Airlines; El Al Israel Airlines; Emirates; EVA Air; Japan Airlines; Korean Airlines; LAN (Chile); Lufthansa; Malaysia Airline; Mexicana Airlines; Philippine Airlines; Qantas; Singapore Airlines; Swiss International Air Lines Ltd.; Thai Airways					

Source: Los Angeles World Airports, List of Airlines, http://www.lawa.org/LAXAirlines.aspx (accessed July 9, 2010). Prepared by: Ricondo & Associates, Inc., May 2012.

#### Table 10

#### Gated 2009 DDFS -- Average Numbers of Turns Per Gate

Terminals	Turns	Number of Gates	Average Number of Turns/Gate
Terminal 1	132.0	15	8.8
Terminal 2	45.5	10	4.6
Terminal 3	60.0	12	5.0
Terminal 4	85.0	13	6.5
Terminal 5	54.0	13	4.2
Terminal 6	67.5	13	5.2
Terminal 7	85.0	11	7.7
Terminal 8	95.5	11	8.7
American Eagle Commuter Terminal	32.0	12	2.7
TBIT	49.0	12	4.1
West Gates	13.5	19	0.7
United Express Commuter Gates <sup>1/</sup>	0.0	18	0.0
Totals	719.0	159	4.5

Note:

<sup>1/</sup> All United Express flights were accommodated at Terminal 8.

Source: Ricondo & Associates, Inc., April 2011 (average numbers of turns per gate based on gating model results). Prepared by: Ricondo & Associates, Inc., May 2012.

## 4. 2025 DESIGN DAY FLIGHT SCHEDULE

The 2025 DDFS serves as a future year condition flight schedule. It was developed to represent a schedule of aircraft movements and passenger traffic distribution throughout the 24 hours of a PMAD projected at LAX in 2025. The following sections present the steps taken to prepare the 2025 DDFS, including data sources, assumptions, methodology, and the results of the flight schedule development process.

Domestic and foreign airline scheduling practices and operations constantly evolve to adapt to various economic, financial, and airport operational constraints, as well as shifts in passenger demand.

With more than 60 airlines providing scheduled-passenger service at nine LAX terminals, many uncertainties exist and need to be considered when developing future passenger schedules. In the case of the SPAS analyses, the forecast horizon covers a 14-year span, during which numerous unknown events may occur, including increases or reductions in service; potential mergers, consolidations or bankruptcy filings; changes in code share partner agreements; terminal reassignments; and changes in fleet mix.

To respond to these uncertainties, airline-specific characteristics assumed in the 2025 DDFS (primarily scheduling practices, seat configurations and terminal assignments) were generalized to reflect those of typical airline and industry practices.

## 4.1 Data Sources and Assumptions

The 2025 DDFS was derived from the following sources:

- The LAX Passenger Forecast results (see Section 2).
- The 2009 DDFS (see Section 3).
- Aircraft manufacturers' reference planning manuals and databases accessed on the websites for Boeing, Airbus, Embraer, Bombardier, and Saab to obtain general planning information, seating configurations, as well as aircraft manufacturing schedules, air carrier orders, and anticipated delivery dates.

The following assumptions were made to prepare the 2025 DDFS.

- <u>Passenger volumes</u>: the annual passenger activity is forecasted to be 78.9 Million Annual Passengers (MAP) in 2025, which represents approximately 245,000 total daily passengers on a PMAD at LAX.
- <u>City pairs</u>: regions, markets and city pairs anticipated to be served in 2025 were identified based on those included in the 2009 DDFS. Cities where service was recently discontinued from LAX were selected as representative of new potential markets.
- Aircraft fleet: for scheduled passenger and cargo activity, the future aircraft fleet was developed based on the 2009 DDFS aircraft fleet assumed to be operating in 2025. Older, less fuel-efficient aircraft were identified and assumed to be retired by 2025. Newer aircraft that would be operating by 2025 were added to the available fleet mix. For non-scheduled activity (except cargo), no change in the aircraft fleet mix was assumed between 2009 and 2025.
- <u>Time of operation</u>: expected daily hourly distributions of operations were assessed based on (1) the 2009 DDFS; (2) typical peaking activity recorded at LAX; and (3) typical industry scheduling practices and destination/origin airport characteristics.
- <u>Aircraft seat capacity</u>: the number of seats assumed on each aircraft was set at the average number of seats based on industry standards and typical seat configurations published by aircraft manufacturers.
- <u>Assumed load factor</u>: future average load factor targets for 2025 were set between 80 and 82 percent, reflecting historical values and typical performance of recently profitable air carriers.

 <u>Minimum turn times</u>: for scheduled-passenger operations, the following minimum turn times were assumed: ADG II-0:45; ADG III-1:00; ADG IV-1:30; ADG V-2:30; and ADG VI-3:00. Because nonscheduled activity operations were not matched, turn times were involved in the development of the 2025 DDFS.

## 4.2 Methodology and Results

The 2009 DDFS was used as a base schedule to develop the 2025 DDFS. The number of scheduled passengers and resulting operations was forecasted based on the results of the LAX Passenger Forecast discussed in Section 2. Based on review of recent trends, projections were developed for non-scheduled passenger, non-scheduled air taxi, cargo, GA and military operations. The following paragraphs describe the methodology used to develop the 2025 DDFS and the results of the flight schedule development process.

### Scheduled-Passenger Fleet Mix

Based on the results of the LAX Passenger Forecast, domestic and international passenger growth factors were applied to each market in the 2009 DDFS. The development of the 2025 DDFS was based on an iterative process that assessed each market individually and the resulting load factor. Future average load factor targets for 2025 were set between 80 and 82 percent, reflecting historical values and typical performance of recently profitable air carriers. Mathematically, if the individual load factor on each aircraft is equal to or close to the overall target load factor, the target overall airport-wide average load factor will be reached.

On a market basis, the estimated 2025 number of passengers was assessed against the number of available seats in the baseline flight schedule (the 2009 DDFS). This comparison resulted in three scenarios under which the available number of seats assigned to a particular market was:

- (1) Sufficient to accommodate the estimated number of passengers, resulting in a load factor below or within the target load factor range of 80 to 82 percent.
- (2) Sufficient to accommodate the estimated number of passengers but resulted in a load factor greater than 82 percent. This scenario would require increasing the number of seats available.
- (3) Not sufficient to accommodate the estimated number of passengers, resulting in a load factor greater than 100 percent. This scenario required increasing the number of seats available.

To accommodate a higher than desired load factor, typical industry practices would suggest either (1) adding frequencies to the markets (scheduling extra weekly or daily flights), or (2) scheduling larger aircraft with greater seat capacity.

A comprehensive fleet list was assembled, which included aircraft types (reflecting the retirement of older, less fuel-efficient aircraft and the addition of newer aircraft types) and the corresponding numbers of seats based on the manufacturers' recommended seat configurations. In deciding whether to add a frequency or to increase the size of the aircraft, careful attention was put on the availability and reasonableness of a larger aircraft being scheduled to a particular market. It was important to ensure that a larger aircraft could be scheduled to a particular market considering whether the destination airport could physically accommodate a larger aircraft (being especially true for smaller regional airports), and whether the aircraft had adequate range to reach the market. As additional seats were input into the model, the resulting load factors decreased and were compared to the targeted load factor.

### Departure and Arrival Times of Scheduled-Passenger Activity

Departure times of scheduled-passenger operations that were included in the 2009 DDFS were retained and rounded to the nearest 10-minute increment of time to reflect potential future adjustments in schedules. When new operations were created, departure times were selected based on destinations, as well as typical industry scheduling practices. For instance, flights to East Asia or Europe were typically scheduled within defined windows of time throughout the day in order for the passengers to reach Asia and Europe at convenient times and be able to make their connection flights.

Arrival times were set using typical turn times based on industry standards and manufacturers' data, as listed in Section 4.1. Accordingly, turn times were subtracted from the departure times discussed in the preceding paragraph.

### Cargo Operations

For the purposes of projecting cargo operations for 2025, air freight activity trends over the period of 1999 to 2009 were analyzed. Over the ten-year period, overall annual air freight activity at LAX varied between approximately 2.05 million tons in 2005 (high point) and approximately 1.60 million tons in 2009, with growth varying around an average of approximately 1.90 million tons. This included express cargo tonnage (primarily FedEx and UPS) as well as all cargo activity. Transported tonnage decreased at a CAGR of 1.6 percent over the ten-year period. Although positive growth was recorded post-2001, air freight activity at LAX steadily declined starting in 2005 through 2009, recording a 6.0 percent decrease (CAGR) over the four-year period. Express cargo held approximately steady through 2009, whereas all cargo activity decreased significantly between 2007 and 2009 (from approximately 600,000 annual tons in 2007 to approximately 380,000 annual tons in 2009).

For comparison purposes, over the same period of 2005 to 2009, the U.S. air freight tonnage totals increased through 2007 (28,960 million tons), with a small decrease in 2008 (27,845 million tons) and a significant decrease in 2009 (reaching 23,472 million tons). Over the 2005 to 2009 period, U.S. transported tonnage decreased at a CAGR of 4.0 percent.

As demand for transported tonnage varied greatly over the 1999 to 2009 period at LAX, relying on the past 10-year trends would not provide a reliable basis for projecting future 2025 tonnage levels. For programmatic planning purposes, it was assumed that an annual increase of 1.0 to 1.5 percent in the number of cargo operations through 2025 would provide for conservative growth at LAX. A daily total of 58 cargo operations were recorded in 2009. Out of 58, 12 flights were "orphan" flights, with no departure or arrival flights on the same day. Adding 12 daily flights to match with these departure or arrival orphans increased the number of cargo operations to 78 daily operations, which represented a CAGR of 1.2 percent between 2009 and 2025. Along with an increase in the number of daily cargo operations, new cargo carrier aircraft were assumed to be in operation in 2025, which provided additional tonnage capacity. New Boeing 777-200Fs and 747-800s were introduced in the 2025 DDFS cargo fleet, to replace older McDonnell Douglas DC-10s and Boeing 747-400s, respectively.

### General Aviation, Non-Scheduled Passenger and Military Operations

GA activity represented approximately 2.8 percent in the 2009 DDFS. The number of annual GA operations at LAX decreased at a CAGR of 1 percent over the period of 1999 to 2009. For programmatic planning purposes, and to provide for some opportunity for GA activity to upturn over the next 14 years, it was assumed that an annual increase of 0.5 to 1.0 percent in the number of GA operations through 2025 would provide for conservative growth at LAX. A daily total of 46 GA operations were recorded in the 2009 DDFS. Adding 5 daily flights resulted in 51 daily GA operations in the 2025 DDFS and represented a CAGR of 0.6 percent through 2025. Similarly to the approach described above, 5 daily flights were selected to be matched to orphan arrivals or departures. No change in GA fleet mix was assumed in 2025 when compared with 2009.

Non-scheduled passenger and military operations represented a small fraction of the total number of daily operations at LAX in 2009 (0.3 and 0.5 percent, respectively). No growth was assumed in the numbers of non-scheduled passenger and military operations for 2025.

**Table 11** presents summary statistics for the 2025 DDFS operations by types of operations (arrivals and<br/>departures).**Table 12** presents the 2025 DDFS aircraft fleet mix by ADG.**Figure 3** depicts the 2025<br/>rolling 60-minute distributions of operations and passengers.

### LAX 2025 DDFS Summary Statistics

	Δri	rivals	Departures		Total Operations		
Operations		Ivais	Depa				
Domestic	844	82.6%	844	81.9%	1,688	82.2%	
International	178	17.4%	187	18.1%	365	17.8%	
Total	1,022		1,031		2,053		
Seats							
Domestic	109,358	73.2%	120,721	79.9%	230,079	76.6%	
International	39,964	26.8%	30,398	20.1%	70,362	23.4%	
Total	149,322		151,119		300,441		
Seats/Operation							
Domestic	130		130		130		
International	223		164		193		
Total	146		136		141		
Passengers							
Domestic	88,564	72.9%	97,864	79.7%	186,428	76.3%	
International	32,860	27.1%	24,954	20.3%	57,814	23.7%	
Total	121,424		122,818		244,242		
Average Load Factor							
Domestic		81.0%		81.1%		81.0%	
International		82.2%		82.1%		82.2%	
Total		81.3%		81.3%		81.3%	

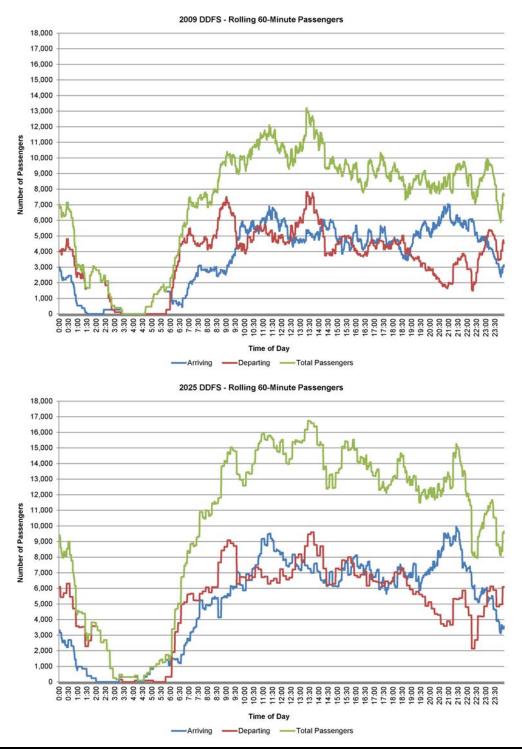
Source: Ricondo & Associates, Inc., April 2011 (summary statistics). Prepared by: Ricondo & Associates, Inc., January 2012.

Airplane Design Group/ Aircraft Families	Operations	ADG Percentage of Total Operations	Percentage of ADG Operations
ADG I			
Propellers	5		41.7%
Regional Jets	7		58.3%
Total ADG I Operations ADG II	12	0.6%	
Propellers	152		35.2%
Regional Jets	280		64.8%
Total ADG II Operations ADG III	432	21.0%	
Airbus 318,319,320,321,32s	273		28.6%
Boeing 737 Series	588		61.6%
McDonnell-Douglas 80-90 Series	16		1.7%
Regional Jets	77		8.1%
Total ADG III Operations ADG IV	954	46.5%	
Airbus 300-310s	8		2.0%
Boeing 757 Series	184		45.9%
Boeing 767 Series	190		47.4%
McDonnell-Douglas 80-90 Series	2		0.5%
McDonnell-Douglas DC-10 Series	5		1.2%
McDonnell-Douglas MD-11 Series	10		2.5%
Lockheed C-130	2		0.5%
Total ADG IV Operations ADG V	401	19.5%	
Airbus 330,332	6		2.8%
Airbus 343,345,346	22		10.2%
Boeing 747 Series	65		30.2%
Boeing 777 Series	89		41.4%
Boeing 787 Series	33		15.3%
Total ADG V Operations ADG VI	215	10.5%	
Airbus 380	27		69.2%
Boeing 747-800	12		30.8%
Total ADG VI Operations	39	1.9%	
Grand Total	2,053	100.0%	

Source: Ricondo & Associates, Inc., April 2011 (aircraft fleet mix by ADG). Prepared by: Ricondo & Associates, Inc., May 2012.



LAX 2025 DDFS – Rolling 60-Minute Operation and Passenger Distributions



Source: Ricondo & Associates, Inc., May 2012 (operation and passenger distributions). Prepared by: Ricondo & Associates, Inc., May 2012.

## 4.3 Gating

The 2025 DDFS was gated to the assumed 2025 conditions for the alternative terminal and gate layouts analyzed in the LAX SPAS. The assumptions, methodology and results related to the gating of scheduled passenger aircraft are presented in the following sections. Non-scheduled aircraft were not gated.

## 4.3.1 Description of Terminal and Gate Layouts

Three terminal and gate layouts were developed to gate the 2025 DDFS for the following SPAS alternatives, as depicted in **Figures B** through **D** in **Attachment A**:

- SPAS Alternative 1 (Figure B)
- SPAS Alternative 2 (Figure B)
- SPAS Alternative 3 (Figure C)
- SPAS Alternative 4 (Figure D)

For the purposes of developing detailed airside design assumptions that could be utilized in modeling a reasonable range of airfield configuration options, and do so in an efficient and cost-effective manner taking into account contract scope and budget considerations, the gating exercise focused on only Alternatives 1 through 4. Based on the detailed information developed for those alternatives, the SPAS Environmental Team was able to estimate performance assumptions and projections for Alternatives 5 through 7, as utilized in the aircraft noise and air quality analyses. No gating analysis was undertaken for Alternatives 8 or 9 because those alternatives do not include terminal or airfield improvements.

From a gating standpoint, the terminal and gate layouts assumed under SPAS Alternatives 1 and 2 are identical. Therefore, gating results were applied to both alternatives.

All three terminal and gate layouts include the CTA terminals (Terminals 1 through 8), TBIT, the Midfield Satellite Concourse (MSC), and commuter positions.<sup>4</sup> All three layouts include 153 gates assumed to be in use to gate the 2025 DDFS. The use of a Terminal 0 Concourse was assumed under SPAS Alternatives 1 and 2. Under SPAS Alternative 3, a linear concourse was assumed to replace Terminals 1 through 3.

## 4.3.2 <u>Assumptions</u>

The following assumptions were used to gate the 2025 DDFS:

- The terminal and gate layouts presented in this section were developed for programmatic planning purposes only. The gating results provided input into the airspace simulation and ground access analyses.
- TBIT procedures were followed as it related to towing aircraft off a gate after 90 minutes for widebody aircraft.
- As an industry standard to reflect common airline practices, a minimum gate rest time of 15 minutes between a departure and the next arrival at a gate was maintained.
- As noted on Figures B through D, aircraft positions are depicted for illustration purposes only. Typical gating practices were assumed such as segmented pushbacks where apron linear frontage is limited.

<sup>&</sup>lt;sup>4</sup> The DDFS and assumptions related to the assignment of passengers arriving and departing to and from the MSC utilized in the SPAS analysis represents programmatic level plans for the MSC. LAWA may proceed to implement separate and independent phases of the MSC Project, and at such time when LAWA determines that certain phases of MSC Project make operational and financial sense to implement, LAWA will initiate a project-level EIR that will document and analyze refined plans and assumptions concerning the operation of the MSC.

 A targeted average of 6 turns per gate was assumed for all terminals except TBIT. An average of 4 turns per gate was assumed for TBIT, which is characteristic of an international terminal with larger aircraft and longer turn time requirements.

## 4.3.3 <u>Methodology and Results</u>

The gating methodology used to gate the 2025 DDFS reflects uncertainties in future airline assignments to specific terminals. For programmatic planning purposes and because airline assignments throughout the LAX terminals in 2025 would be uncertain at the time this analysis was undertaken, the focus of this analysis was placed on maximizing the level of service and gate utilization at LAX.

The gating approach was developed using assumed targeted average numbers of turns per gate developed as means to assign groups of aircraft to each terminal. One aircraft turn is defined as an aircraft arriving at a gate and departing from the same gate, without being towed. If the aircraft is towed on for departure or off after arrival, it would be counted as one half turn.

The typical number of turns per gate varies according to the size and type of airport. Large gateway airports observe numbers of turns per gate averaging between 4.5 and to 5.5 turns (e.g., JFK and SFO); whereas airports with significant domestic hubbing and international activity (e.g., ORD or ATL) observe numbers of turns per gate averaging between 6 and 7 turns. The average number of turns per gate at LAX has typically been approximately 5 turns per gate, as evidenced by the 2009 average number of turns per gate of 4.5.

For this analysis, and except for TBIT, a targeted average of 6 turns per gate was assumed, which represented a relative increase in future gate use efficiency compared with the typical 4.5 to 5 turns per gates observed at LAX. For TBIT, the targeted average number of turns per gate was assumed to be 4 turns, reflective of characteristics of an international terminal with larger aircraft necessitating longer gate turn times. Gate assignments based on these average numbers of turns per gate demonstrates efficient gate use across terminals. It also reflects an increased level of service because flights would be spread among terminals and more time would be provided in between flights. In essence, this approach resulted in spreading the number of aircraft across all terminals based on the number of gates assumed in use in 2025. Terminals with a higher number of gates than other terminals would accommodate a higher number of aircraft.

Accordingly, the number of gates assumed in use in 2025 at each terminal was multiplied by the targeted average number of turns per gate, resulting in the number of aircraft turns that would be assigned to each terminal. For instance, Terminal 1 was assumed to have 12 gates in 2025. At a daily average of 6 turns per gate, Terminal 1 was assumed to be able to accommodate approximately 72 turns.

Flights to TBIT were the first flights to be identified because only international flights were assigned to it. The 2025 DDFS was sorted by domestic and international flights, and by arrival times. With 19 gates available and a targeted number of 4 turns per gate, 76 turns were assigned to TBIT. The remaining international flights were returned back into the pool of flights to be assigned to terminals with U.S. Customs and Border Protection (CBP) capabilities.

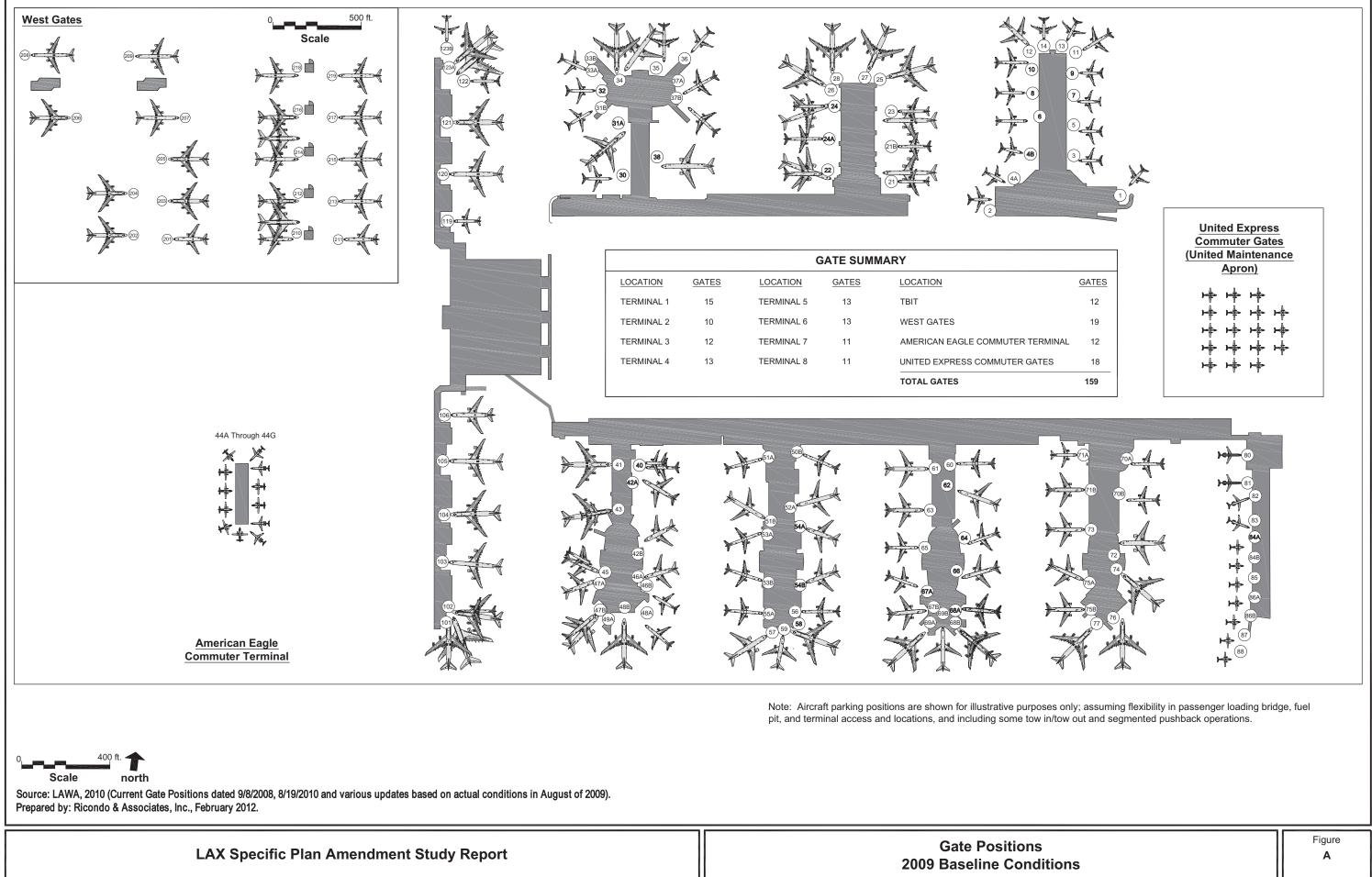
After all flights included in the 2025 DDFS were assigned to terminals, the gating model was run. Through multiple iterations, all aircraft included in the 2025 DDFS were successfully gated under each of the four SPAS alternative conditions. The results of the gating exercise are provided in Attachment B.

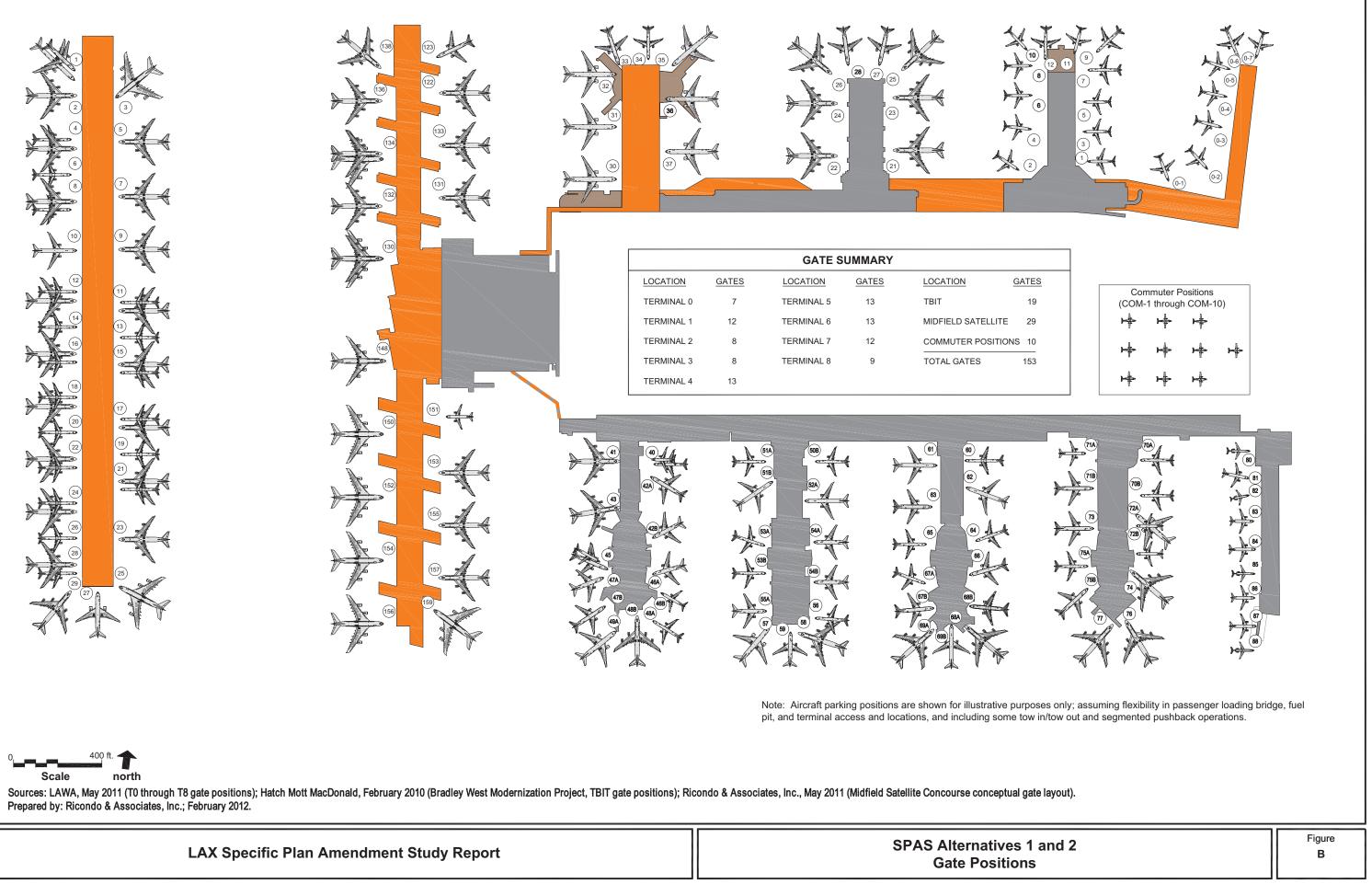
 Table 13 presents the average numbers of daily turns per gate calculated based on the results of the gating exercise.

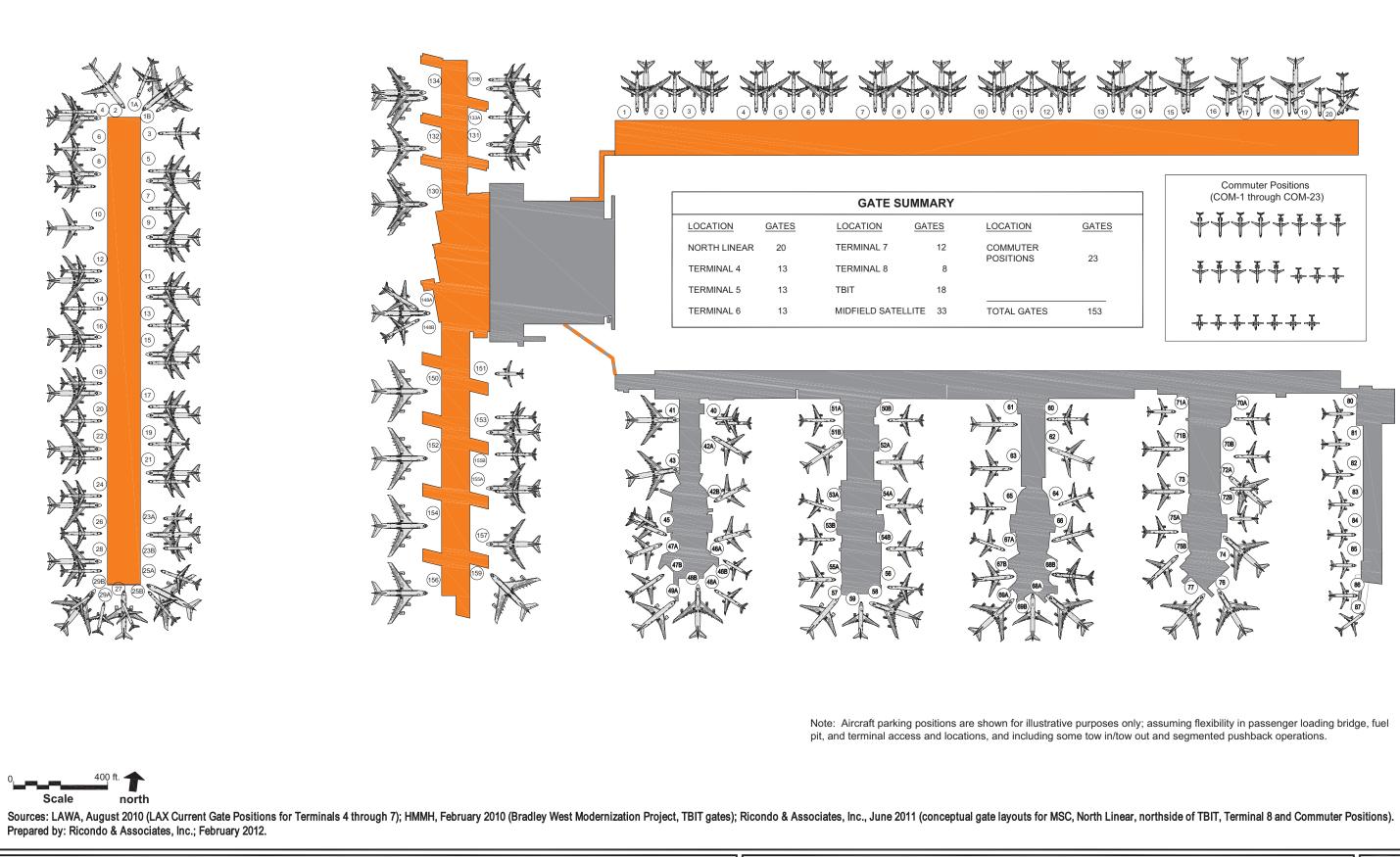
Terminals	Alternatives 1 & 2			Alternative 3			Alternative 4		
	Number of Turns	Number of Gates	Average Number of Turns per Gate	Number of Turns	Number of Gates	Average Number of Turns per Gate	Number of Turns	Number of Gates	Average Number of Turns per Gate
Terminal 0	50.5	7	7.2	0.0	0	0.0	0	0	0.0
Terminal 1	89.5	12	7.5	104.5	14	7.5	0	0	0.0
Terminal 2	56.5	8	7.1	68.0	10	6.8	0	0	0.0
Terminal 3	57.5	8	7.2	81.5	12	6.8	0	0	0.0
Terminal 4	79.5	13	6.1	79.5	13	6.1	85	13	6.5
Terminal 5	81.0	13	6.2	81.0	13	6.2	89	13	6.8
Terminal 6	76.0	13	5.8	76.0	13	5.8	91.5	13	7.0
Terminal 7	71.5	12	6.0	71.5	12	6.0	80	12	6.7
Terminal 8	70.0	9	7.8	70.0	9	7.8	46.5	8	5.8
Commuter Positions	44.0	10	4.4	44.0	10	4.4	126	23	5.5
MSC	194.0	29	6.7	194.0	29	6.7	203.5	33	6.2
North Concourse	0.0	0	0.0	0.0	0	0.0	138	20	6.9
ТВІТ	85.0	19	4.5	85.0	18	4.7	95.5	18	5.3
Grand Total	955.0	153	6.2	955.0	153	6.2	955	153	6.2

Source: Ricondo & Associates, Inc., May 2012 (calculated numbers of turns per gate based on the results of the gating exercise). Prepared by: Ricondo & Associates, Inc., May 2012.

## ATTACHMENT A GATE LAYOUTS



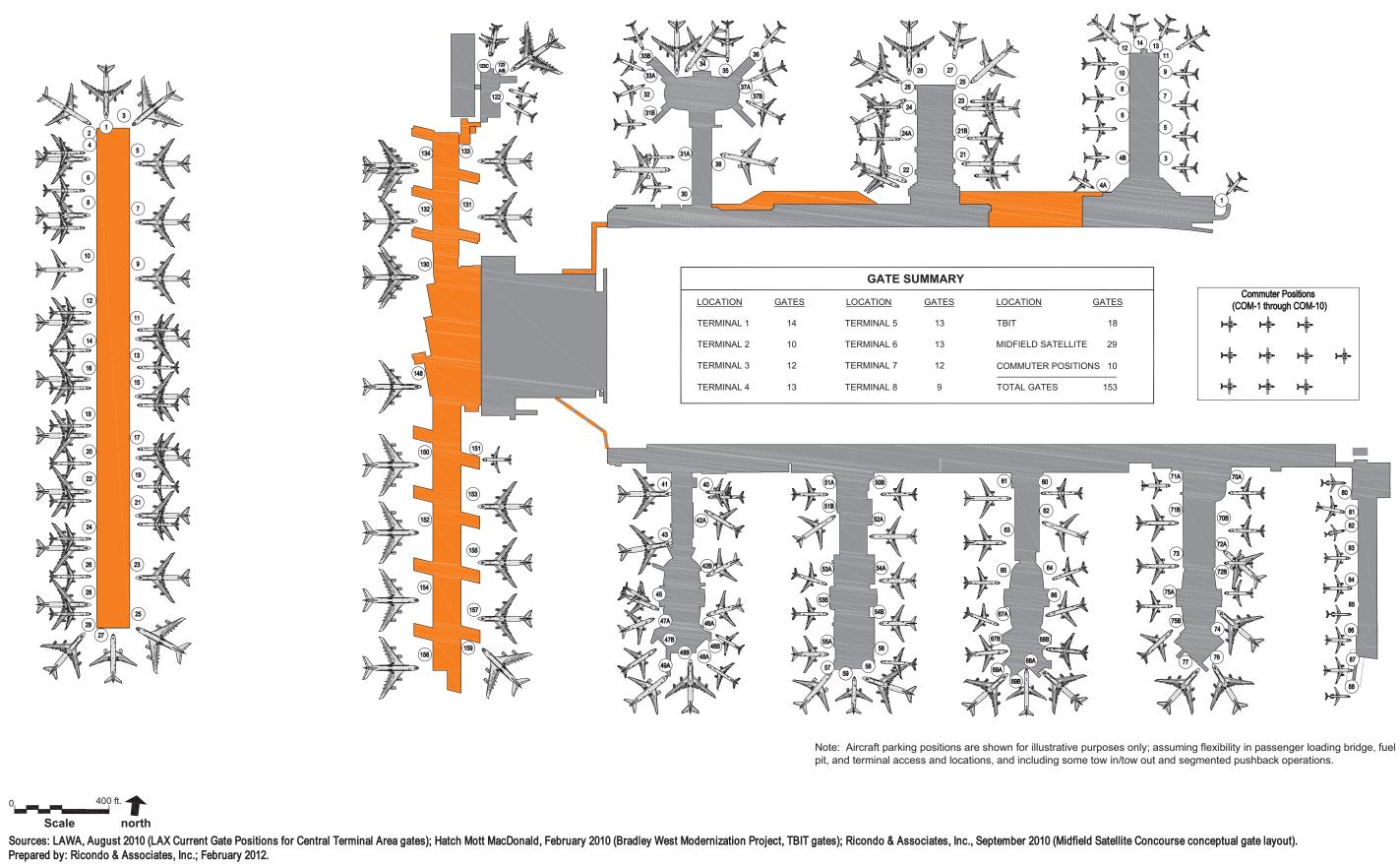




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SPAS Alternative **Gate Positions** 

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SPAS Alternative Gate Positions

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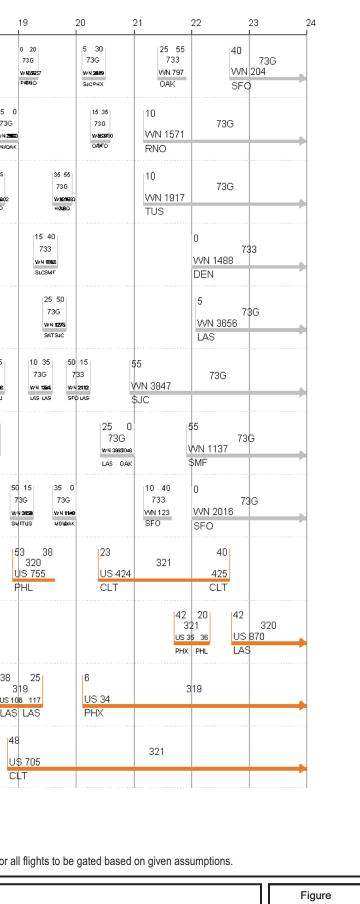
## ATTACHMENT B RAMP CHARTS

1	2 3 4	5 6 7	.8 .9	10	11 1	12 13	14	15	16	17	18
WN	73G	10 40 73 1841 мнн SFO Аво	8991 W N 2294	35 0 733 WN 4894 TUS ELP		20 50 73G www.sonados Hou uas		5 30 73G WN <b>1027</b> ЧЮ <b>У</b> РО	7 WF	15 3G (282%) ФРНХ	10 30 73G W 163072 UASLC
WN	73G	0 579 OAK	20 50 73G www.23007 QAK SAT	35 0 73G w ч алаа РНЖАК		15 05 706 20 55 73G WM105/7 WN 900 900 SUELP OAK MDW	733 W 188176	85	35 0 733 wn <b>3430</b> ацербо	73 G VV 40456	73 96 W N
WN	73G	55 20 55 73G 1288 www.9997904 MDVV OAK SJC	736 W19662622	40 10 73G wn 15471 MCIDEN	20 45 73G พ.พ. <b>3989</b> ฉละสมชอ	30 0 736 73 wn 322261 wn Tus gar Phy	G 73G 894s ₩N9702	72		20 50 73G wn 227947 sjcelp	25 45 703 W199200 SECTO
WN	733	35 187 RNO	35 0 733 www. <b>знаг</b> Рнхбила	35 35 733 W 18600 ELSNC		5 25 0 20 733 735 WNBA-1 WN19950 LABHX ABUF	15 40 733 WN <b>298</b> QAKAUS	5 25 733 W 169696 Тыбас	15 40 735 WW 2220 Сакрнх	735 www.1444946	0 25 733 WN SBAL ELPSMF
WN	73G	45 3025 SJC	10 35 73G www.ceaz RNGBLC	73G www.1955079	0 35 73G www.986.692 MDW/SLC	25 45 40 705 73 WH62877 WH SKIGRT Right	) 73G 2845 WNI22365			73G 73 www.sonson www	15 3G (2780) \$Suc
WN	73G	30 423 LAS	55 20 73G พ.พ.ชอช มะเมร	50 15 40 0 733 736 www.7990 wws.966 Autosing uws.976	73G	20 45 73G www.8207 GAVRHO	15 45 73G www.эвээв7 smf phx	20 45 733 WN 1662 LASPHX	25 50 73G WN 9335 UNS UNS		20 45 73G wn <b>зяяе</b> Рнжюц
WN	73G	15 40 25 73G 1532 VVN 596 SMF TUS	55 20 0 20 73G 73G WN 33786 W МОКСК SLCPHX SFASSO	25 45 730 W168669 S7013		45 10 73G www. <b>8805</b> sfo_as	10 35 73G WW 1801 MDW3JC	20 45 73G WN <b>290</b> ОАКАВО	10 30 73G W262875 РныС	30 0 73G wn 134992 wdw las	73G WN 35598
WN	73G	5 25 10 73G 3668 WN 1549 SFO DEN	25 50 733 w + 2207 swadyw	35 0 733 WH <b>1728</b> LASOAK	50 73 94 94 94	3030676 W191919		15 40 733 WH <b>2197</b> SFOTUS		15 40 73G WN 1997 OANSFO	
		0 30 320 <u>us 704</u> CLT		16 321 US 797 1 PHL	494			320 US 29	20 500 PHX		
ŲS	320	5 1742 LA\$		46 0 321 US 1431 796 CLT PHL		38 50 319 US 104 162 LAS LAS			37 US 1 PHL	0 320 405 1514 PHX	
US	319	35 21 PHX	55 321 US 24 PHX	45 5 0 14 U PHX L	2 40 319 5 103 105 AS LAS	33 35 321 US 1419 1416 PHL PHL					31 US L
us	321	30 1418 PHL	10 0 319 US 101 102 LAS LAS		31 320 US 27 PHX	25 ) 46		45 US LAS	319 110 397		

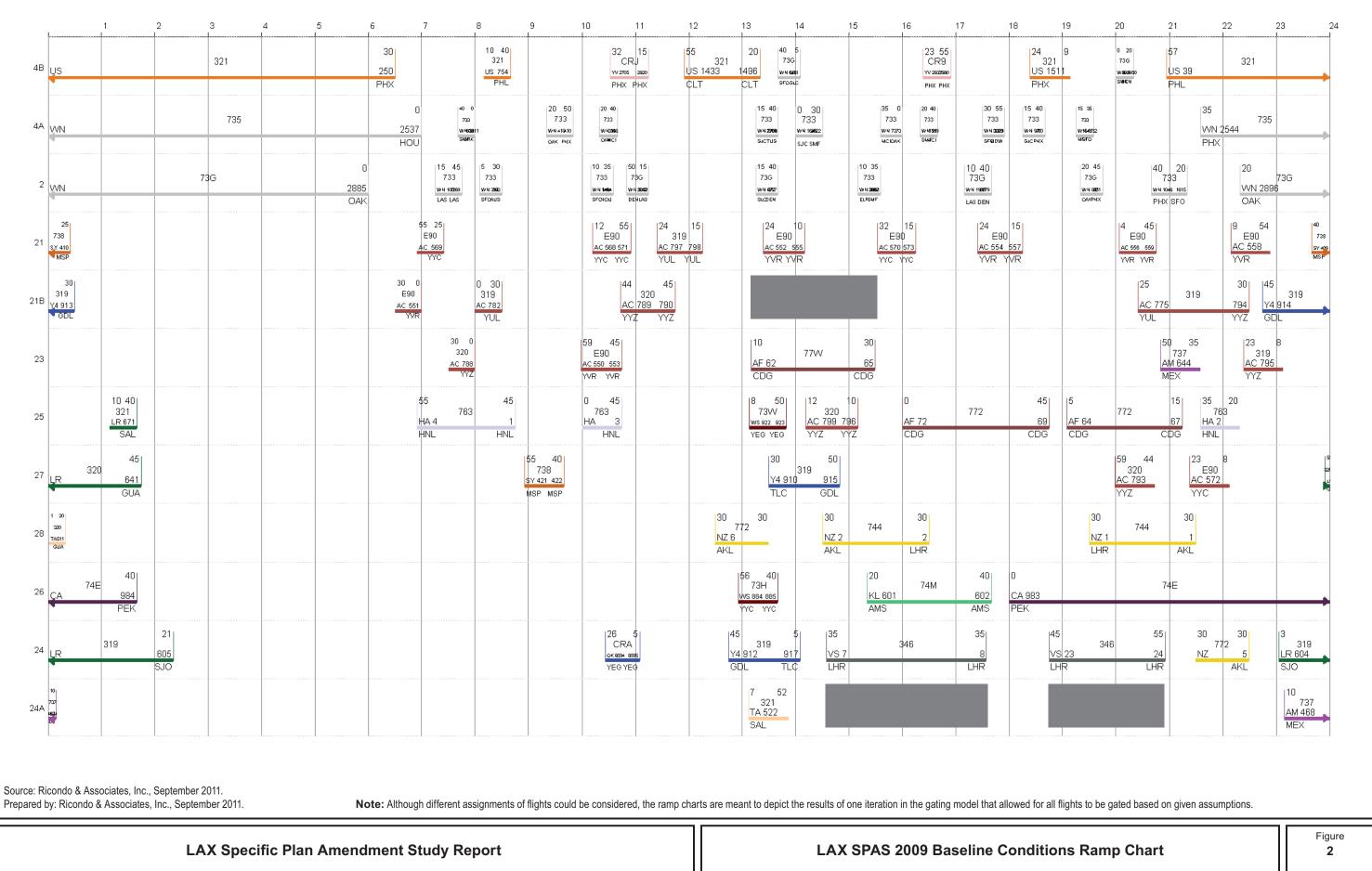
Note: Although different assignments of flights could be considered, the ramp charts are meant to depict the results of one iteration in the gating model that allowed for all flights to be gated based on given assumptions.

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LAX SPAS 2009 Baseline Conditions Ramp Chart



1

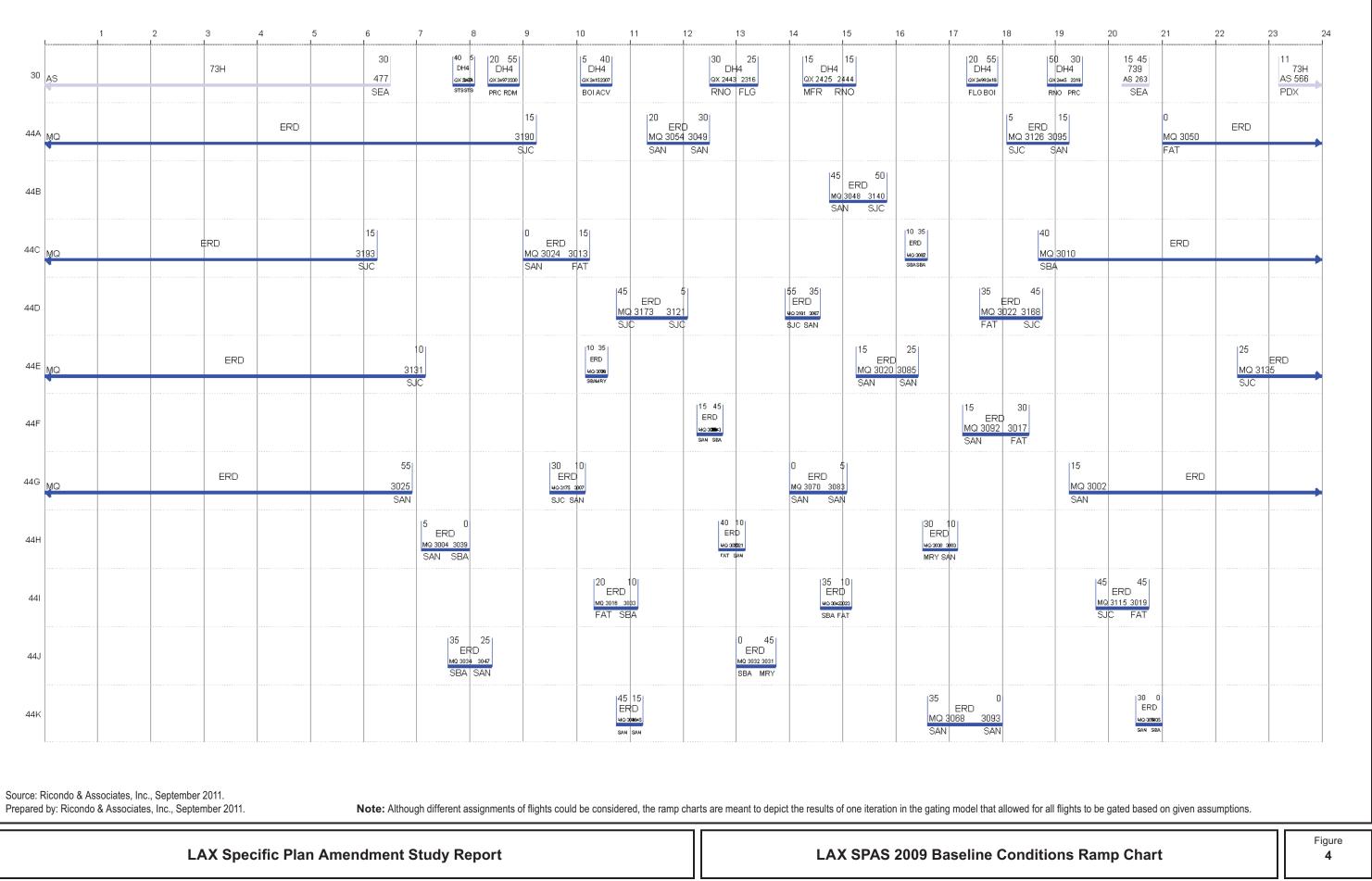


1 2	2 3 4	5 6	7 8	9 10	11 12	13 14	15 16	17 18
22 30 45 820 TA 510 531 GUA SAL			MEX AM 460	45 37 471 GDL	20 AM 19 MEX M	15 347 EX		25 763 55 HA 10 9 HNL HNL
38	319		0 40 925 VX SFO SE	45 320 780 406 A JFK	35 25 319 <u>VX 924 929</u> SFO SFO	0 320 VX 784 SEA	416 JFK	
37В	320	30 921 SFO	10 40 320 <u>VX 781</u> SEA	15  320  VX 363 1  BOS	10   10  AD	20 <u>VX 40</u> JFK	55 320	
37A VX	320		30 50 50 320 404 VX 920 108 JFK SFO IAD	25 <u>VX 40:</u> JFK	3  789  V	55 55 319 <u>/X 928 937</u> \$FO SFO		20 10 320 <u>VX 936 945</u> SFO SFD
36	320	3E BO	0 30 S	25 320 VX 89 36 IAD BOS	4 VX 4	35 320 407 412 JFK		20 3 VX 79 SEA
35				24 30 734 AS 720 453 SFO SEA	24 54 734 AS 7105710 YVB PDX			46 AS 470 SEA
34 34 570 570 570			56 0 73H AS 150 149 ANC ANC		734 A\$ 246	15 703 VR		25 73 AS 7
33B AS	73H		40 709 YVR	25 0 DH4 ax 24212418 MFR BOI	42 30 73H AS 458 459 SEA SEA	A	0 3 73G S 464 46 EA SE	
33A				45   15 739 ∧s.≪2272 8ЕА  ZIH	4 34 40 739 40	0 CR7 2547 2640 M PDX		46 734 30 AS 466 471 SEA SEA
32 <sub>AS</sub>	73H		30 451 SEA	20 AS 244 73H PDX PC	5 48 50 73H 67 A\$ 5 6	47 73G AS 252 PDX	30 465 SEA	25 25 73H AS 474 245 SEA PDX
318				30 40 739 AS 258 258 YVR PVR				
31A AS	73G	0 561 PDX	30 15 43 DH4 0x2441 2442 AS RNO RNO SE	25 40 73H 240 250 <u>xx</u> 2	DH4 7 2605 2601 AS 40	30 3H 30 461 SEA	50 A\$ 704 YVR	30 73H 457 SEA

Note: Although different assignments of flights could be considered, the ramp charts are meant to depict the results of one iteration in the gating model that allowed for all flights to be gated based on given assumptions.

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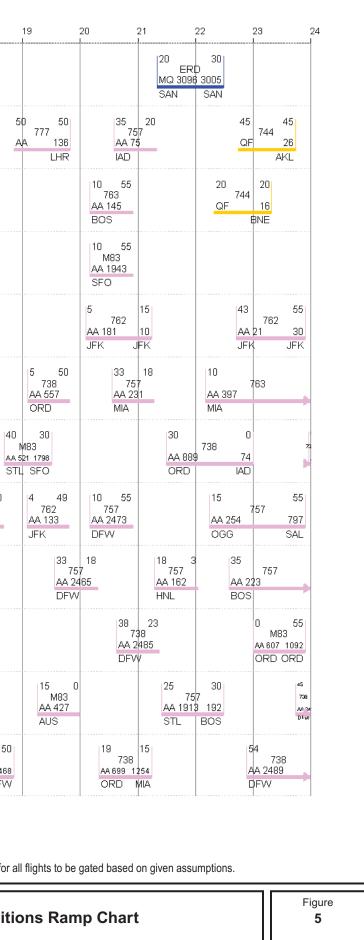


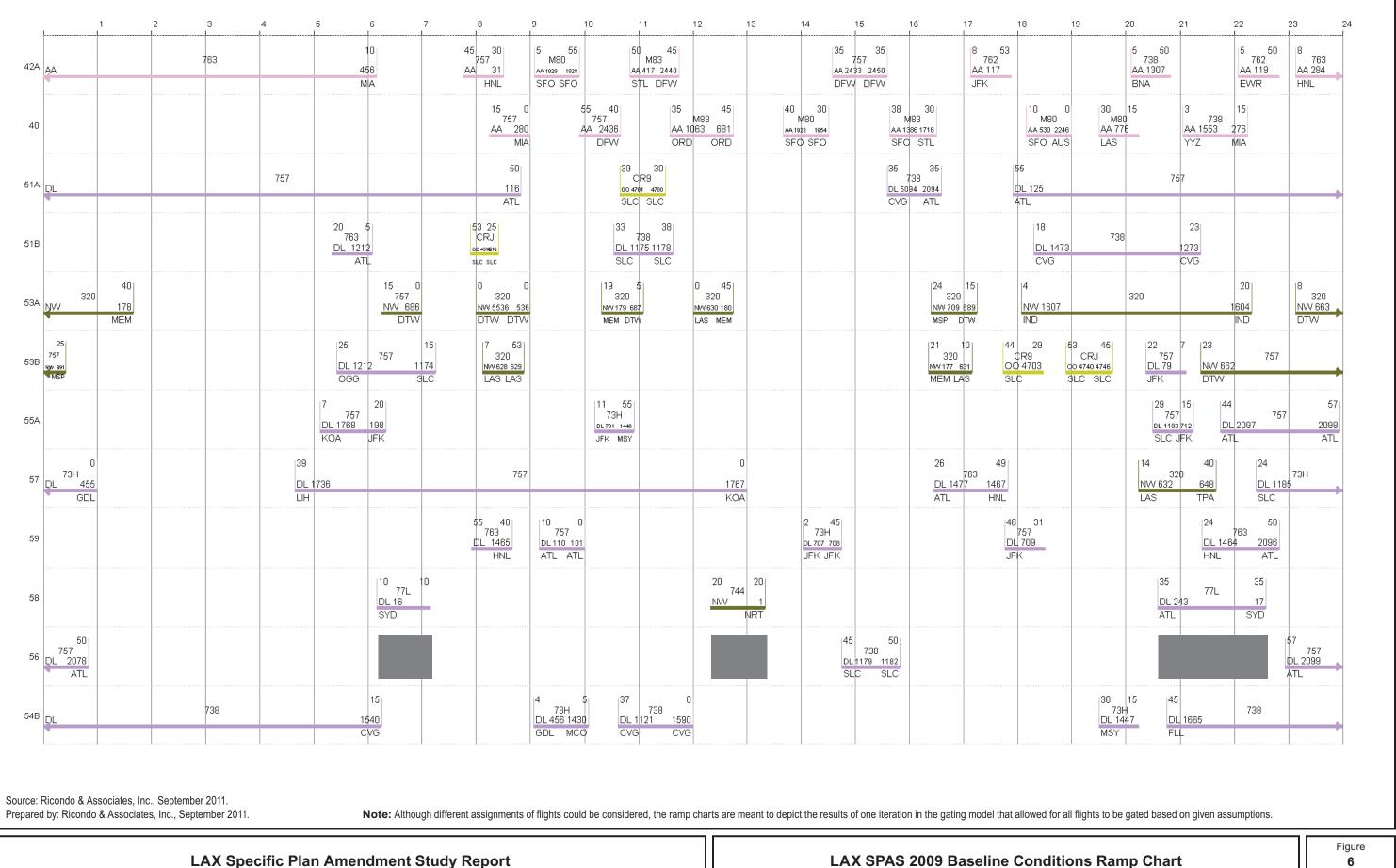


Ŀ	1	2	3	4	5	6	7	8	9	10 L	11	12	13	14 I	15 !	16	17	18
44L							55 45 ERD M0 3014 3011 FAT FAT						25 50 ERD MG 3088 MB 1564					
41					38 AA HNL	757 298 662	0 1 744 QF 15 BNE		55 40 763 AA 1180 ORD	20 AA 170 NRT	50 777 1520 MIA			15 777 AA 137 LHR	15		15 57 247 KOA	
43					5 AA 14 OGG		10 30 416 QF 2 FW AKL	5		35 AA 2 MIA	99 777	45 169 NRT			24 M8 AA 338 SJD	25 80 741 LAS		
45							0 30 M83 AA 1920 SFO		M80 311 237	4 0 738 AA 2411 1974 DFVV BNA		58 50 M80 AA 2417 2446 DFW DFW	20 75 AA 798 SAL	30 7 768 STL		AA	3 30 M80 ≤2453 678 ™ DEN	
47A	14 AA 185 JFK		76	2		11: JFI	8 A/	738	5 30 762 A 2 JFK		34 AA 1 JFK		15 32 JFK			15 180 JFK		
47B /	AA		763			55 2412 DFW	757 AA 2401	2422	35 AA 21 JFK		10 0 M83 AA 1268 581 SFO SFO	I			15 726 OS	13 738 AA 1345 7 ORD C	1890 A4	D 25 763 A 277
49A ,	55 738 AA 2408 DFVV				30 75 AA 24 KOA	16		0 45 762 AA 114 EWR	10 738 AA 2407 15 DFW Y		757 25 264 S BOS		30 AA 19 JFK		AA 244	40 757 15 285 LIH		4 A S
48B						55 25 M83 AA 1182 AUS	AA	3	55 40 757 AA 2430 DFW		15 757 AA 2413 2 DFW D	15 2444 FVV	AA 27	35 57 1 252 MIA	35 AA 2 MIA		1	55 40 757 AA 2459 DFW
48A ,	АА			757				30 244 MCO	10 55 757 AA 253 OGG		13 738 AA 149 IAD	20 1458	AA	30 M83 545 S	18 7: AA 297 MCO		0 757 AA 2457 DFVV	
46B					35 738 AA 62 OR	5 40 1 7 20 AA D C	10 38 1868 DRD	55 25 M80 AA 2428 DFW	20 M83 AA 2099 8 ORD OF	36 4	54 55 M80 AA 774 1915 AS LAS			55 55 738 AA 2196 144 DFW IAD			50 45 738 AA 263 2458 IAD DFW	
46A 46A	10 738 607				20 AA 286 LIH	757	30 202 MIA	15 ( 757 AA 78 IAE	3	0 30 M83 AA 733 LAS		AA 24	35 57 21 2448 DFW		43 AA HN	757 270 :	8 28 76 297 AA 4 INL ORD	13 63 55 0
42B /	AA		738			15 410 FW	4: A	762	45 AA	763 283 а.	0 40 M80 A 1469 812 DEN STL	3 55 M80 AA 813 1308 AUS AUS	25 738 AA 1247 ORD (	1624	A	0 40 M83 A 449 1563 TL SFO		48 50 738 AA 1519 2468 DEN DFVV

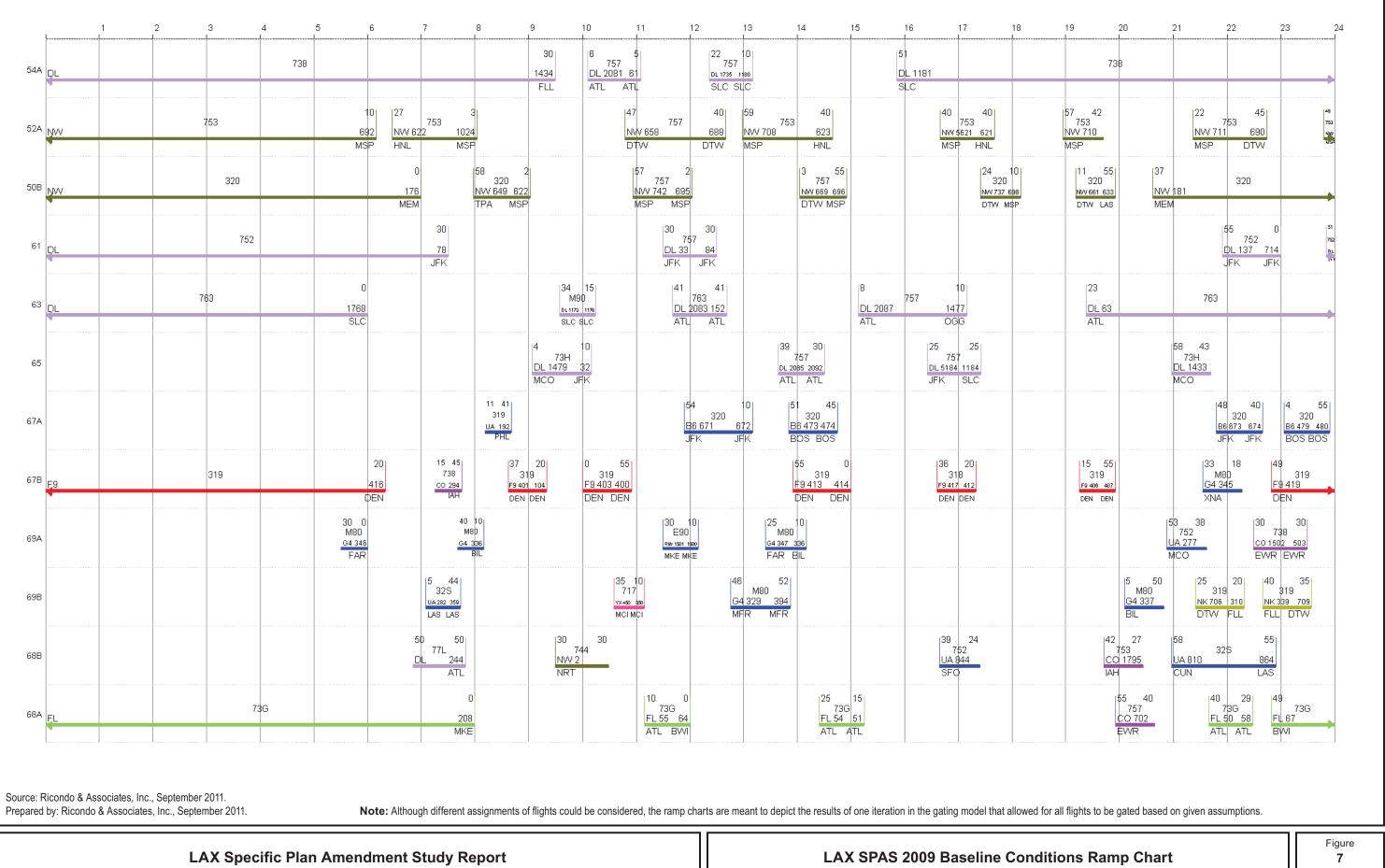
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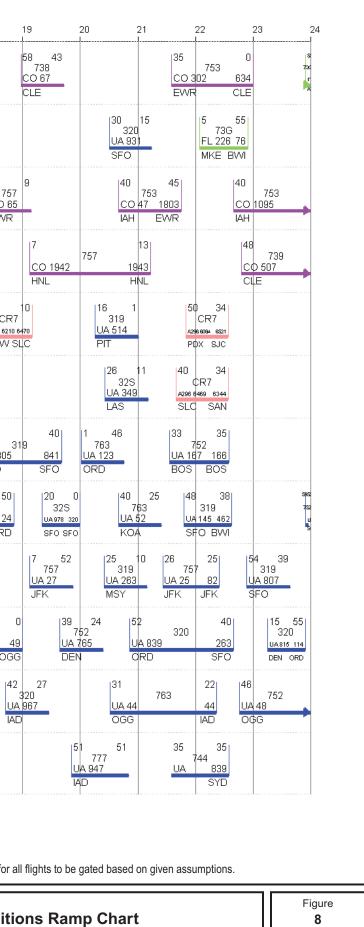
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1 2	3 4	5 6	7 8	9 10	11 12	13 14	15 16	17 18
66 FL	73G	4{ ATI		10 0 757 CO 495 3 IAH HNL	52 58 753 CO 1495 90 IAH EVVR		38 30 738 201695 514 AH CLE	
64 25 CO 595 IAH	738	55 750 CLE	320 UA 111 558	55 8 32S UA 797 809 LAS CUN	50 35 55 45 73G FL 217 349 FL 60 56 MKE BWI ATL		39 35 738 CO 515 1503 CLE EV/R	
62 <sup>30</sup> 753 <u>C0 1094</u> IAH		30 738 <u>C0140</u> EVVF	757 CO 1703	25 10 757 16 EWR	24 30 753 CO 1402 494 EVVR IAH	19 25 753 CO 1605 594 IAH IAH		73B 7 137 CO
60 CO 1684		0 25 757 CO 12 194 HNL IAH	15 C 753 <u>CO 1594</u> IAH	738 CO 1002 556	45         50         14         5           753         753         20         735         384           CQ         735         384         co 1566         61           CLE         IAH         IAH         IAH         IAH	14	52 50 757 CO 17 541 EVVR IAH	733 co 795 1542
71A UA 925 IAD	320	944 ORE		13 40 320 UA 125 814 DEN DEN			50 24 46 30 CR7 319 A298 59855- UA 87 384 SAT ASE LAS LAS	20 
718			3 28 23 752 A 58 UA 261 DEN SFO	752	25 12 5 320 61 UA 888 23 HNL SFO IAE	6 UA 69 47	18 58 325 UA 781 293 SFO SFO	33 30 CR7 4296 5818 6071 SEA PDX
73		41 0 UA 58 18 KOA DEN	48 33 763 UA 57 KOA	53 30 319 UA 477 857 BWI SFO	2 45 319 752 UA 202 202 SFO MSY DEN ORD	0 45 752 UA 817 SFO	0 50 319 UA 139 122 SFO ORD	
75A		40 30 752 46 OG\$ DEN	49 34 752 UA 94 SFO	15 45 320 UA 954 SFO	54 24 44 32S 752 UA 878 UA 83 SFO IAD	30 116 ORD	7 320 UA 255 92 DEN SF	
758		0 10 763 UA 84 286 HNL ORD	49 34 763 UA 45 OGG	UA 963 UA 87	3 37 28 757 7 787 UA 891 SJD JFK	40 28 890 UA JFK JFI	. 53 757 28	16 0 752 UA 85 504 DEN DEN
77		15 0 752 UA 68 324 LIH IAD	38 777 UA 81 HNL	3 53 21 752 UA 103 272 ORD MCO ORI	35 55 45 763 752 342 840 UA 858 336 O ORD \$FO DEN		4 4 752 UA 49 210 IAD IAD	33 752 UA 943 ORD C
76 <sub>UA</sub>	752		36 51 34 752 889 UA 67 SFO LIH	25 55 320 UA 178 ORD SYE		149 UA 935 LHR	0 42 777 948 U. DEN S.	2 27 32S A 798 JD
74			11 16 752 UA 30 106 OGG ORD	42 42 763 UA 979 942 DEN ORD	UA 890	13 891 NRT ORD 3	170 UA 611	15 33 209 HNL

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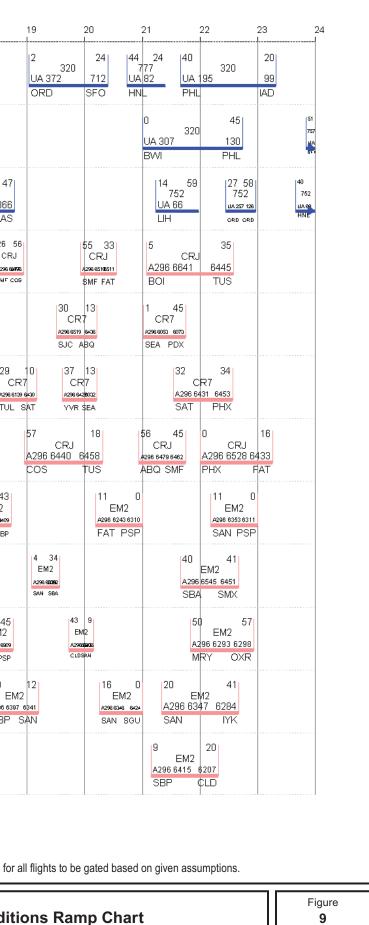
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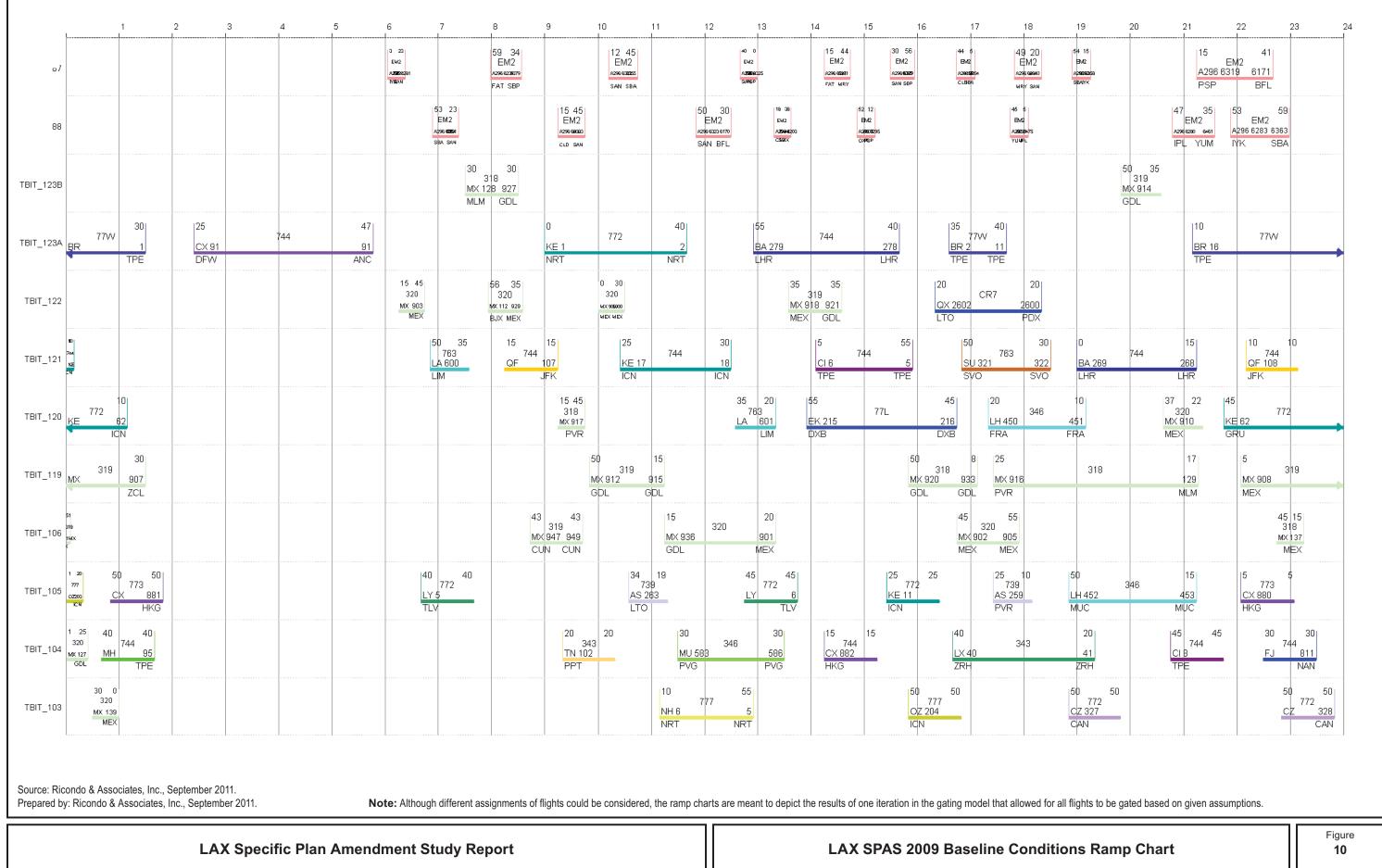


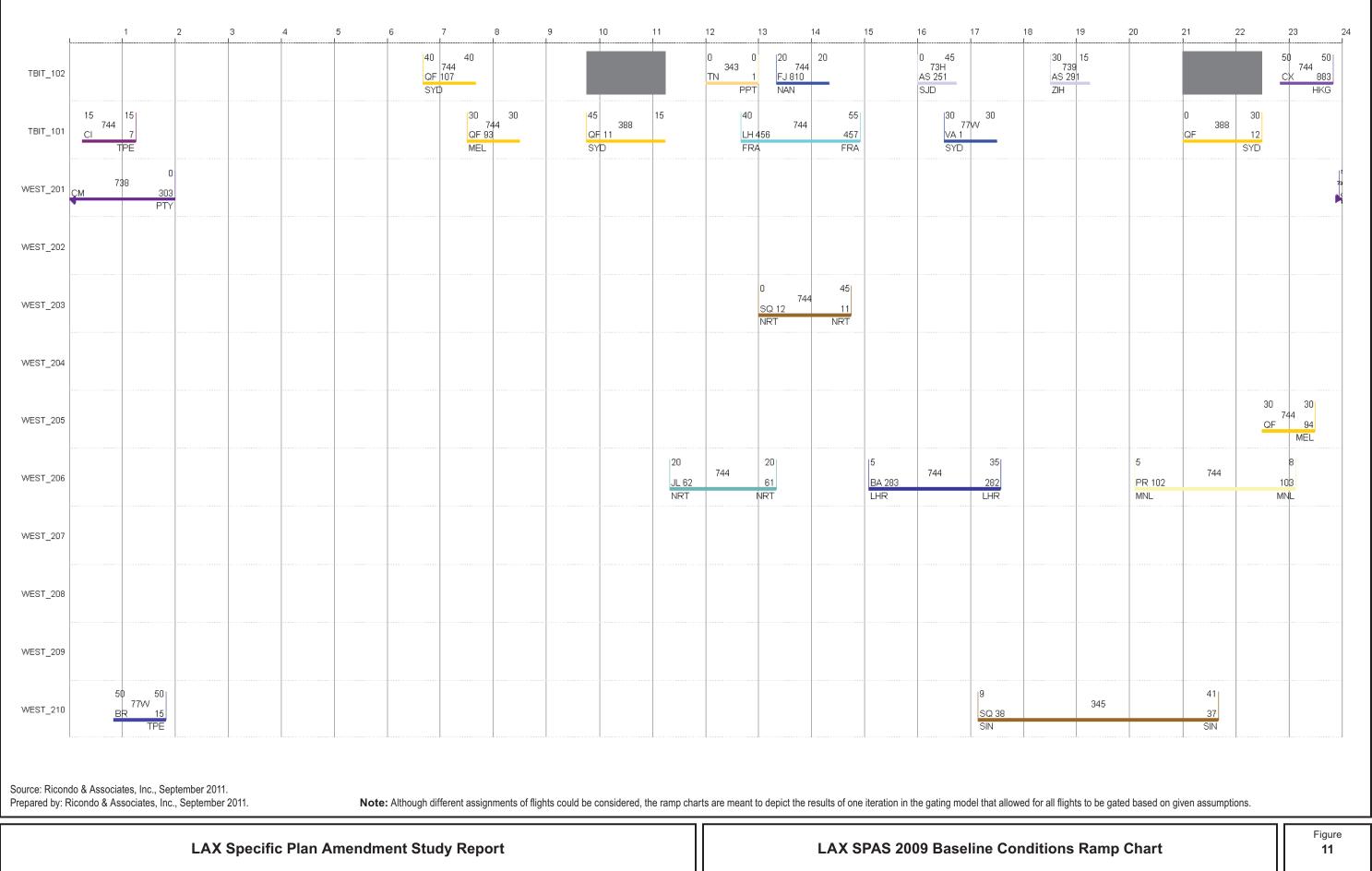
1	2 3 4	5 6	7 8	9 10	11 12	13 14	15 16	17 18
72		15 0 752 UA 508 SFO		0 23 40 752 0 UA 272 856	13 777	59 34	23 46 763 763 UA 80 87 HNL HNL	18 9 320 UA 955 798 SFO SFO
70B UA	757	15 84 JFK	757	50 20 37 320 757 JA 306 UA 23 BVVI JFK	55 10 752 28 UA 531 JFK ORD	118 UA 194	748 ŲA 69	
70A UA	752	30 90 SFO	45 30 752 UA 162 BOS	43 47 752 UA 163 89 BOS OGG	35 14 319 <u>UA 107 808</u> ORD \$FO	57 752 UA 855 SFO SI	O DEN KOA	40 47 32S UA 328 866 LAS LAS
80		C 1/234	3 32 2 CRJ CRJ A396 999072 • A80 SMF COS	45 55 CRJ A296 6509 6506 TUS BOI	10 42 CRJ 42806652 SMF TUS	19 48 CRJ A236 8240 coscos	0 53 CRJ A296 6527 6474 BOI ABQ	26 5( CRJ A2980897 SMF COL
81			2 38 CR7 Accessed SAT DRV SJC PH)		59 36 10 44 CR7 CRJ A259 64/28139 YVR TUL TUS PHX	10 40 CR7 ^2038 6219 DFW	38         8         55         37           CRJ         CRJ         CRJ           A298 69887         A298 6982         6-91           TUS SMF         PHX SMF	20 20 CR7 A296 6425 6428 ASE YVR
82			56 30 53 41 CR7 CR7 298 646888 A998 8517 6105 SLC SLC TUS SEA		2 37 СК7 лсяе влява Аво зеа окс окс		32 6 47 25 CR7 CR7 20800000 A296014519 EEA SEA YVR SJC	15 50 CR7 A298 603899 PDX TUS TUL
83			12 49 CR7 A398 6700001 SAN PDX PDX	6 6114	5 45 CR7 A286 6499 9085 SJC PDX PHX YM	480 A296	6 CR7 2229 ed1 V SAT	40 20 CRJ A398 64715338 ABQ PHX
34-A			46 18 EM2 A2006-05245 S6U FAT	41 1 BM2 Assess PYUL	2	E 429	59 502 3 2008004 Y CLD	7 43 EM2 A286 5056409 SAN SBP
34-В			58 13 EM2 A296 6457 6322 SMX SAN	24 58 EM2 A299 63547 SAN SM60	59 21 8 49 EM2 2 A0066832 BR4RY SMX OXR	Bv/2 A29948255	30 6 EM2 ^200 6036199 SBP BFL	24 50 EM2 A29603000 CXRCLD
85			45 15 37 ЕМ2 Ви лозејавар. дозес уши sba РЭРР	2	5 35 1 40 EM2 EM2 A296 68800 A296 6008027 WRY CLD CLD SAN		36 10 53 13 ЕМ2 емс Азековрят Азековоса SAN SBA гость	12 45 EM2 4200 010900 BFL PSP
36-A			43 15 EM2 A296 (1993) OXR IPL	40 0 EV(2) Accesso CXX8/4	2296	EM2 A29 <b>61029</b> 2	33 3 EM2 може али страни БFL SAN Staten	0 30 20 EM2 EM лозе авае SAN FAT SBP :
36-В			53 22 28 5 EM2 EM2 A296 6200 A296 622 P\$P CLD SAN 02	EM2 A298 6366	0 34 EM2 A286 6368-7 PSP FAT	48 35 EM2 ^2396222 9099 SAN FAT		0 22 EM2 A2989422 SGBRY

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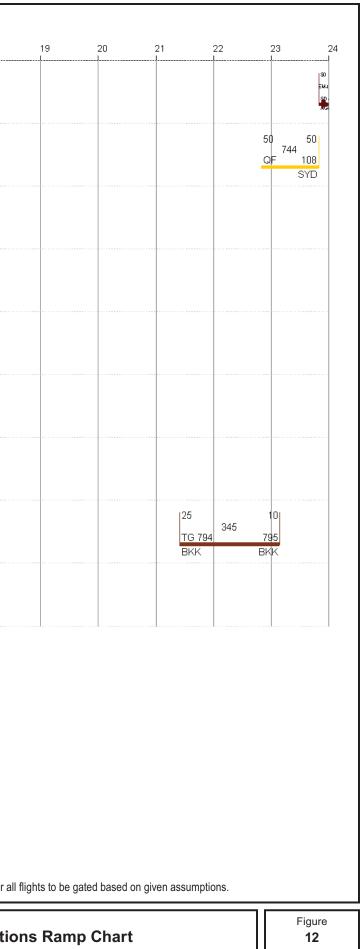




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/EST_211	20 EVJ S§496 730												20 EF 5D 2200 HMO	30 RJ 2201 HMO				
'EST_212													0	0 47 201 ICN				
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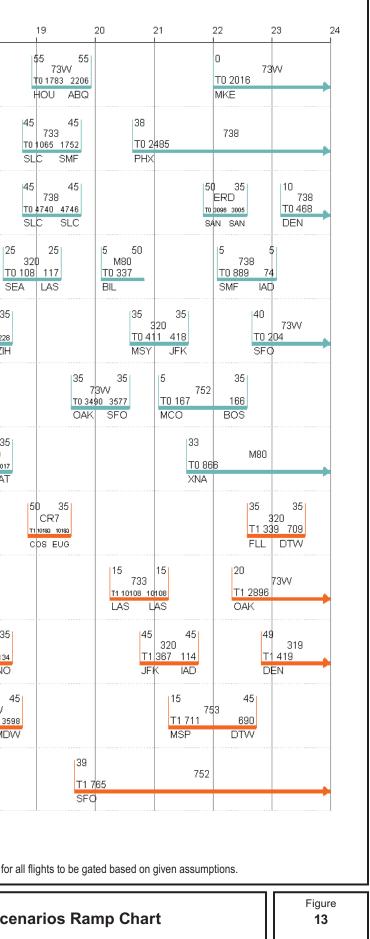
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1	2 3 4	5 6	7 8	9 10	11 12	13 14	15 16	17 18
0-1 T0	73W	45 3025 SJC	15 32/ T0 10042 MEM	15 45 45 CR9 10042 T0 2415 2307		55 55 320 TO 104 162 JFK LAS	15 15 319 T0 10066 10066 DEN BDL	15 73W T0 3760 3760 TUS SJC
0-2 TO	738	25 1182 AUS	55 55 73VV T0 3997 1904	45 45 320 TO 780 406 SEA JFK	25 25 73W T0 3076 3076 SMF MDVV		55 55 73H T0 1179 1182 \$LC SLC	
0-3 15 738 7467 4.51		CR7 10 10118 10118	45 45 738 70 282 359 A\$ LAS	55 55 321 To 10063 10063 PHL PHL	45 45 73W T0 60 56 SJC ATL	5 73VV T0 10015 100 MDVV MD		55 55 73W T0 2279 1947 \$JC ELP
0-4		0 45 CR7 10 10147 SEA SEA	15 15 738 T0 111 558 SFO DEN	55 25 30 738 ER T0 306 10 3016 BWI FAT	20 7 8033 TO 100	35 /3W hts 10018 MKE	15 73V T0 3473 HOU	2724 TO
0-5 <sub>TO</sub>	73W		579 TO 10	25 5 '3W 73H 75 1075 T0 244 5 ABQ JFK PE		ТО	35 5 738 320 515 1503 TO 920 9 W EWR JFK G	
0-6		15 73 <u>10 10115</u> PDX	H 752 10115 TQ 162	35 T0 877 752 SFO S.		25 55 T0 194 752 DEN DEN	73VV 10 10113 10	
0-7	M80		336	ТО 24 14 то 10	35 320 0061 10061 S JFK	5 5 733 T0 2445 82 RNO OAK	45 45 733 T0 159 159 SMF MCI	50 35 ERD 10 3092 3017 SÅN FAT
1		35 5 738 <u>T1 620</u> ORD	ERD T1 3034 3047	T1 10169 10169 T1 4	35 15 738 320 701 4700 T1 671 V SLC SMF		35 733 3662 3662 ⊃ SMF	5 5 M80 <u>T1 10084 10084</u> BIL BIL
3 <sub>T1</sub>	73//		35 10 5 CR7 187 TI 8500 652 RNO PRC PH	738 T1 125 814	35 35 738 11 10023 10023 ORD MSP	35 35 738 <u>T1 1923 1954</u> RDU SFO		5 5 738 <u>11 10154 10154</u> DTW SFO
5 <sub>T1</sub>	319	25 416 DEN	25 25 73W T1 3374 1250 SJC LAS	25 25 73H T1 240 250 ANC SJD	5 5 35 73W T1 55 64 T1 4 OAK BWI SEA	35 739 60 461 SEA	5 5 73H <u>11 10058</u> JFK JFK	35 35 73W T1 10134 10134 LAS RNO
7		35 5 M80 T1 346 FAR	25 25 73W T1 1163 3374 SLC PHX	15 5 73H T1 10081 10081 SEA ANC	15 45 752 T1 781 146 IAD ORD	15 75 T1 10009 IAH	35 33 10009 IAH	45 45 73W T1 3598 3596 OAK MDV
9 <sub>T1</sub>	752		35 15 73( 889 11 10070 SFO DEN	1do70 T1 173 8	5 55 55 738 36 T1 813 1308 1F AUS AUS	15 45 752 T1 707 708 JFK JFK	35 T1 DE	752 85 504

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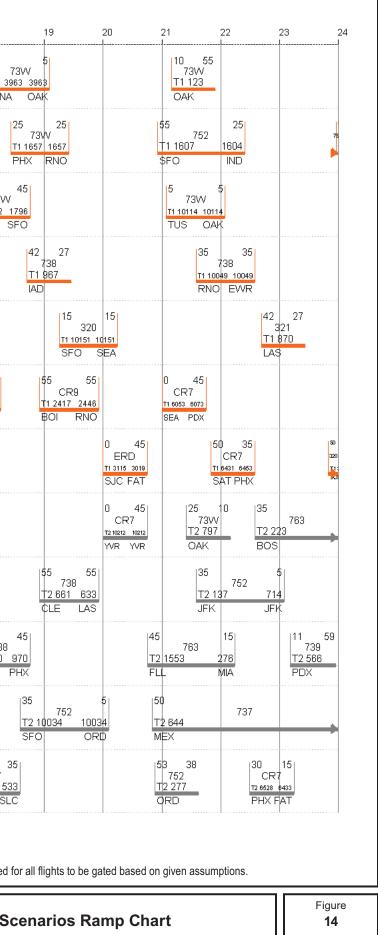
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	1 2	3	4 5	6		7	8	9	10	11	12	13	14	15	16	17	18
11						45 T1			15 738 T1 1052	15	35 11 10	35 738 022 10022	45 T1				5 73V T1 3963 BNA
55 752 12 T1 2408 DFW					20 : CR7 11 6024 647 FAT ABC	2 T1	45 73VV 10099 10099 P ELP		45 733 316 316 4K MCI	5 75 T1 33 JFK	35 2 84 JFK			T1 101	35 CR9 117 10117 C PDX		25 T1 1 PH
10							55 55 73W T1 2921 2207 OAK SAT		5 738 <u>T1 2411 19</u> DFVV BN	74 T	5 45 73W 1 631 2977 DAK RNO	5 73W T1 646 127 SFO SL0		T1 13	35 738 86 1716 STL	T1 3	45 73W 3402 1796 O SFO
8						5 E90 <u>T1 10019 1001</u> MKE MK		5 CR9 <u>T1 2421 241</u> MFR BC	6 T1 2	35 CR9 263 264 LTO	15 738 T1 605 SFO	605	5 73W 73W T1 937 370 LAS LAS	2 т1	5 45 320 10062 10062 AS JFK		
6	0 738 T1 10229	1022 PT			T1	45 733 100 1269 S LAS	15 738 11 10106 10 RDU L	106 T1 100	35 320 021 10021 MSP	5 738 T1 1268 5 SFO SF	i81	55 55 73VV T1 3751 3439 HOU LAS	15 320 11 10157 10 JFK S	157	15 738 T1 709 6 LAS DT		
4						5 319 <mark>T1 10065 1006</mark> BDL BD	55 T1	0 35 ERD 10101 10101 AT FAT		5 45 733 10159 10159 FO SFO	T1 14	35 321 19 1416 PHL		10 55 CR7 T1 6527 6474 BOI ABQ		15 320 T1 936 9 SFO SI	945
2 <sub>T1</sub>		320				45 781 SEA	30 ERI 11 3024 SAN	〕 \$190	5 73VV T1 10039 100 ATL AT		10 55 CR7 T1 6526 6483 PHX YVR		30 ERI 11 3042 SBA F	3023	5 ( 733 T1 3430 343 AUS SFC		
21 T2		763		15 2410 DFW	45 T2 OG		15 106 RD	35 T2	35 772 283 HNL		CR7	55 55 73H T2 922 923 YEG YEG		10 55 ERD 12 3048 3140 SAN SJC	T2 ·	45 73W 1900 2279 \$ DEN	
23							T2 102	35 738 27 10227 SJD		752 2 107	15 808 SFO	Т2		55 55 320 72 409 793 30S SEA	T2 24	35 738 453 678 V DEN	
25					73 T2 1		5 73W <u>T2 10112 1011</u> TUS OA		35 T2 1 SLC	35 73H 175 1178 SLC	55 55 73H T2 710 5710 YVR PDX				55 763 541 IAH	Т2	45 738 970 970 \$ PHX
27 <sub>T2</sub>		737				25 18 MEX	15 45 739 T2 709 YVR	5 752 T2 477 SFO	35 857 SFO	5 76 T2 10072 DFW	35 3 10072 HNL		25 T2 100: IAD	55 752 31 10031 ORD		5 5 73VV T2 1341 292 MDVV LAS	4 1
28	15 45 321 T2 671 SAL					145 12 SF	45 738 10097 10097 O DEN		5 738 T2 836 17 MEM OA	5 7 <u>3</u> 4K	5 763 T2 2421 DFW	35 3 2448 DFVV	T2 100	35 738 88 10038 ATL		35 7 T2 11 RNO	35 73VV 172 533 SLC

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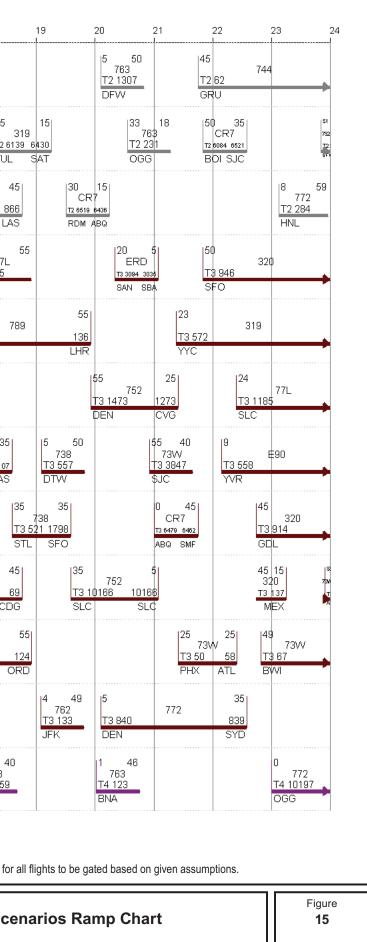
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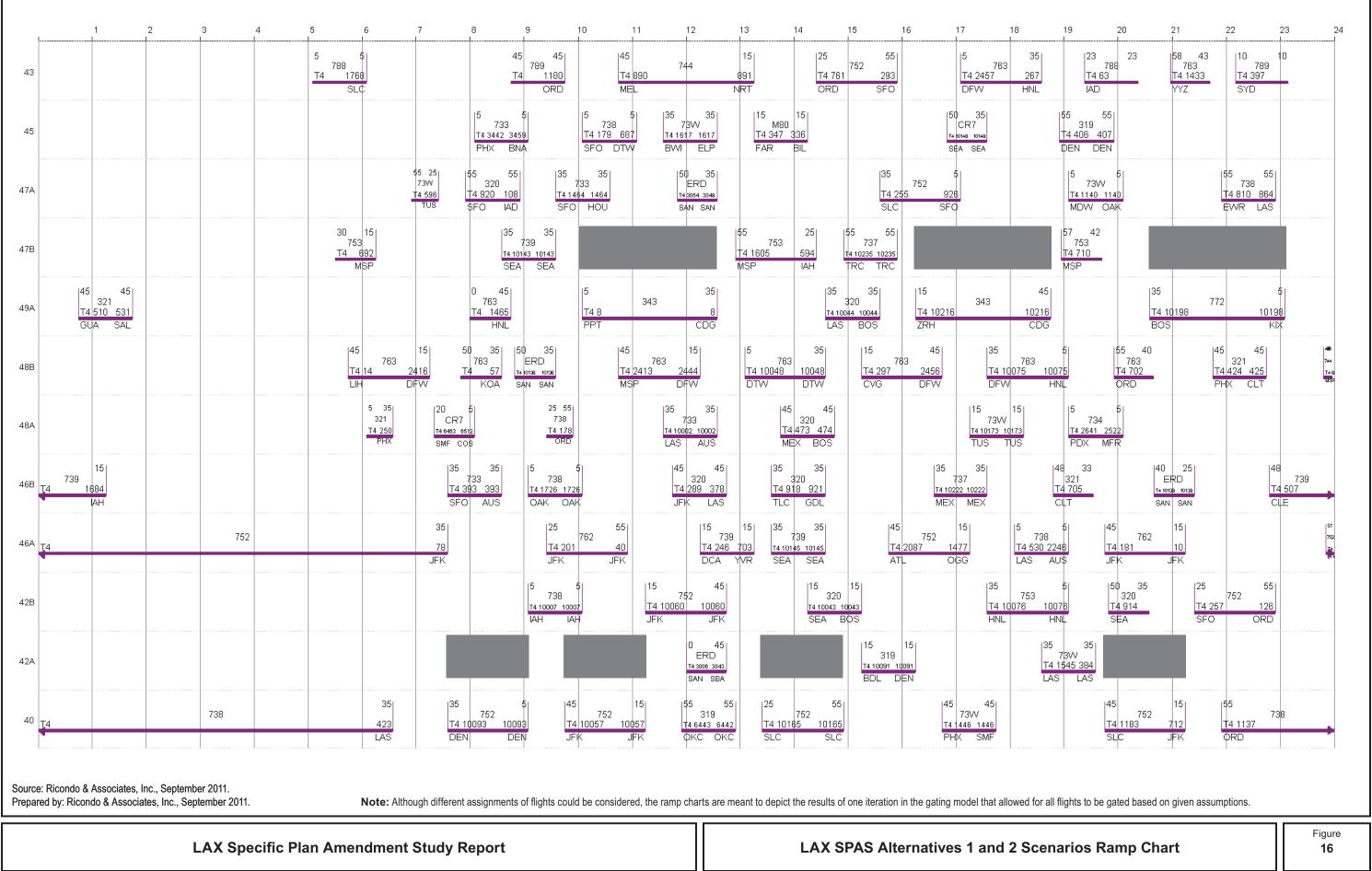


1 2	3 4	5 6	7 8	9	10 11	12	13 14	. 15	16	17 18
26 744 15 T2 62 ICN		35 5 73VV <u>T2 2885</u> OAK	5 5 738 T2 10088 10088 DEN DEN		25 25 321 T2 797 1494 PHL CLT	15 E90 T2 10213 10 YYC Y		35 35 320 72 10224 10224 MEX MEX	15 5 320 T2 110 397 SFO LAS	7
24 <sub>T2</sub>	752		15 22 JFK	7 T2 10074	63 4 10074	35 35 CR9 T2 100\$5 10085 BOI BOI	T2 101:	45 321 22 10122 PHX YYZ	320 15 10215	15 <u>T2 6'</u> TUL
22			35 CR9 <u>T2 10155</u> SFO	0155 T2 3175	3007	25 <u>T2 855</u> DEN	772	55 806 SFO	50 50 772 T2 204 ORD	45 4 738 T2 328 86 SFO LA
37 13	320	35 921 SFO	5 5 73VV <u>T3 609 3811</u> ABQ MCI	15 73VV <u>T3 1547</u> MCI	471 T3 15	15 501 1500 E MKE	5 5 CR9 <u>T3 2547 2640</u> RDM PDX	35 35 321 <u>13 10064 10064</u> PHL PHL	763 <u>T3</u> 2	15 55 77L 247 <u>T3 125</u> OA ATL
<sup>36</sup> 13	319		51 551 YVR	20 5 CR7 10150 10150 PDX SUN	35 762 T3 10054 JFK	10054	5 55 M80 73 329 394 MFR MFR	5 738 73 10029 LAS	10029	25 T3 137 LHR
35 T3 77L 5 T3 455 GDL			35 <u>T3 110</u> ATL	77L 10	321 1 T3 789 79	90 T3	45 73VV 884 885 C YYC		45 77 T3 611 HNL	15 72 209 HNL
34 13	E90			737 10233 10238 T3 1	738 002 556	35 35 739 T3 458 459 SEA SEA	5 5 73VV <u>T3 10035 10035</u> SAT SAT	35 752 T3 49 SFO	5 210 IAD	35 35 733 <u>13 10107 10107</u> LAS LAS
35 320 <u>T3 913</u> GDL			45 15 738 T3 1868 ORD	35 35 73VV <u>T3 10045 10045</u> BVVI BVVI	15 35 763 T3 10027 10027 ORD ORD	75 T3 891	45 2 890 JFK	15 15 73VV T3 54 51 PHX ATL	55 752 T3 5184 JFK	25 1184 SLC
<sup>32</sup> 13	73W		5 208 MKE	0 45 763 <u>T3 2430</u> DFW	25 T3 735 CLE	55 25 394 T3 1019 IAH DEN	77W	55 10199 NRT	15 T3 72 CDG	77W E
31 <sub>T3</sub>	73W		5 35 73W 48 <u>13 10184 1</u> ATL GEG 0	0184 T3 979	45 63 942 ORD	45 45 738 T3 1063 681 MSP ORD		73VV r310100 10100 T	35 35 738 7 <u>3 2675</u> STL SJC	25 T3 209 TAD C
1 25 772 T3 203 ICN		55 25 752 198 ШН ЈFK	73W	45 762 114 EWR	35 T3 742 STL	5 25 695 T3 1023 MSP EVVR	55 763 34 10234 SCL	15 <u>T3 60</u> TPE		45 602 AMS
41 772 35 10197 ICN		15 45 763 <u>T4 298 662</u> LIH STL	763 T4 246	31 76 <u>76</u>	15 35 3 16 <u>T4 1121</u> WR DTW	1590 T4 101:	35 3VV 28 10128 PHX	5 T4 227 DEN	763 53 KOA	55 40 763 T4 2459 HNL

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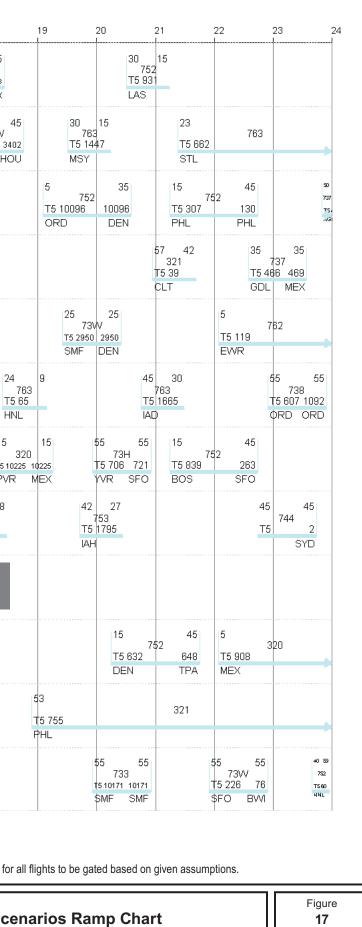


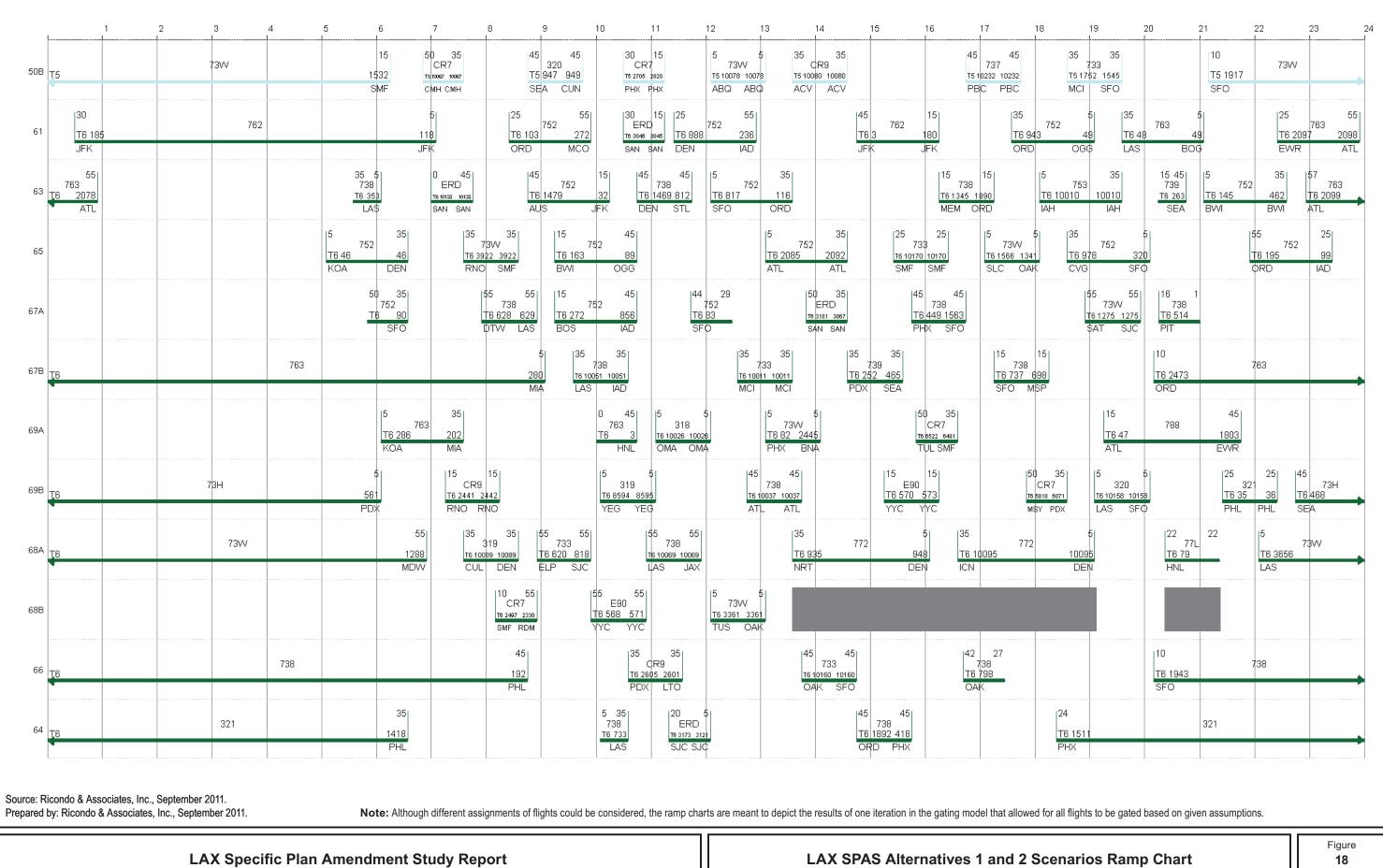


		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17 1	18
51A								-	55 55 73W 75 224 224 DAK SFO	35 T5 21 JFK		5 35 31 T5 1 TL JFK						40 CF 15 6471 SEA	₹7 1 6528
51B T	25 763 15 691 MSP				35 T5 68 HNL	763 3 32 IAI	4	763 T5 2401 24	122 T	) 35 763 5 1434 FLL	5 763 75 842 ORD	35 840 ORD		5 763 75 798 DFVV	35 768 STL	5 763 T5 5094 MCO	35 2094 ATL	T5 1	4 73W 796 340 < HO
53A	25 737 IS 5496 AGU					T5 102	35 73H 26 10226 PVR	35 T5 49 SFO				15 7 75 858 SFO	45 52 336 DEN						
53B						20 752 T5 50 SFC	8	50 35 CR7 15:6435 6234 SAT DFW	23 752 T5 261 IAD		T5 2	35 73VV 217 349 MKE		15 319 T5 552 DEN	555		35 739 64 467 SEA	5 5 CR9 T5 10024 10024 MSY MSY	
55A <sub>T</sub>	T5				762					35 2 JFK	т5	25 752 61 HNL	15 738 75 10028 11 MSP O	028 TS	5 45 733 5 2964 2964 FO AUS		15 7 T5 5621 MSP	45 753 621 HNL	
57						5 788 T5 121 AT		15 71 T5 4 DFW	45 33 1 HNL	25 T5 170 IAH	772	55 1520 MIA	T5 100	35 738 06 10006 HOU	25 32 T5 784 BOS	20 1 416			24 T5 HN
59								55 55 CR9 T5 4799 4793 PHX PHX	20 ( 753 T5 1594 IAF				752 1735 1	15 180 3LC	T5 10	35 ∉90 012 10012 MCI	T5 10 <sup>4</sup>	35 320 150 10150 < SEA	15 75 10 PVF
58	45 T5	744					15 456 MIA	T5 3I	35 3VV 382 503 SLC			55 T5 600 IAH	788	25 601 LIM		35 T5 2 EVVI	763 70 29		28 3
56										0 45 752 T5 954 SFO					15 CR9 T5 2425 MFR F	2444			
54B T	320 T5	35 907 ZCL							15 45 321 T5 754 PHL	15 738 T5 2099 8 ORD 0		5 73W T5 1714 171 BNA OA	4 тз	0 35 CR7 10102 10102 JC SJC	т	50 35 CR7 \$10121 10121 PHX PHX	25 T5 100 ORD	55 752 032 10032 ORD	
54A T	T5			321				5 742 LA\$	-	55 55 738 75 1929 1928 DEN SFO		5 45 320 5 103 105 7K LAS		т	50 35 ERD \$ 10175 SJC SBA	Е т5 30	25 RD 120 3085	20 5 CR7 15 10131 10131 STS ST\$	
52A									) 35 763 5 1703 EVVR		25 T5 25	55 763 264			20 ERD 15 3070 30 SBA SA	183	15 7 T5 1477 ATL	45 763 1467 HNL	

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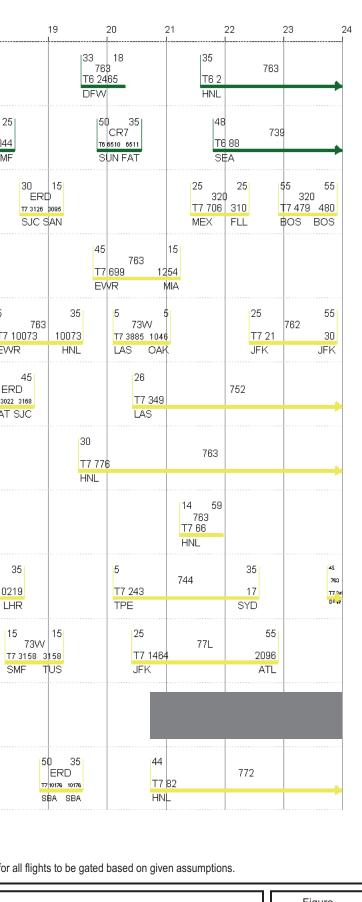




1	2 3	4 5	6	7	8	9 1	10 1	11	12	13	14	15 1	6	17
т <u>е</u>	763			5 686 DTVV				15 76 76 2083 ATL			55 55 738 T6 2196 144 MDVV IAD	πε	5 55 CR9 3 2837 2880 TO PHX	
Ţ6		739			35 451 SEA			15 73VV <u>76 10164 10</u> SJC S	164		25 733 T6 1696 TUS	1696		25 73 T6 844 ELP
35 5 320 T7 138 MEX				10 55 CR7 17 6523 6499 PHX SJC	25 31 T7 401 DEN	9 104 771	) 35 CR7 10120 10120 JS PHX	25 319 T7 924 SFO	) 929	5 319 77 10090 1009 YVR DE	90 T7 101	35 21 23 10123 PHX	T7 100	35 321 47 10047 CLT
3					0 35 762 7 34 JFK		15 76 T7 417 CVG	45 3 2440 DFW		5 763 T7 271 MIA	35 252 MIA	T7 2	45 738 223 223 D PHX	8 53 762 T7 117 JFK
		55 τ7 φG		55 55 73VV 17 10013 10013 MDVV MDVV	Т7	763 7 2407 15	86 77 1014	39 14 10144	0 45 CR7 1710077 10077 ABQ ABQ	25 T7 669 DTW	55 763 696 MSP		55 763 161 OGG	
T7	752		15 1540 CVG	0 45 ERD 17 3014 3011 FAT FAT	15 7 77 311 OGG	45 52 237 SJD	15 320 T7 912 9 SFO GI		752 531	118	55 55 320 7 910 915 BOS GDL	Т7	36 752 1181 EN	
3 T7		763					0059 <del>п</del> е	I 35 CR7 8315 6247 AN FAT			763 725 7	15 26 DS	25 T7 10 IAD	55 763 9 HNL
1 25 , 744 17 2 SYD				35 <u>T7 4</u> ICN		2 2 3 HNL	3	0 45 CR7 17 6499 6065 SJC PDX	15 T7 12 ICN	744	45 11 NRT		30 7/ T7 1 TPE	
15 783 2900 U W				T7 1	35 320 12 929 MEX	5 5 73VV T7 1954 2278 SMF LAS	-	15 T7 10094 SYD	772	45 10094 DEN	15 321 T7 799 7 YYZ Y			5 763 T7 10219 LHR
				35 T7	35 772 81 HNL		25 T7 23 ATL	55 752 26 JFK	T7	45 73W 872 1757 C DEN	20 5 CR7 17 6376 6477 TUS SMF		15 738 T7 177 6 MSP L	831
3						77	) 35 ERD 3038 3079 3A MRY		T7 22	35 MJ 00 2201 HMO		5 5 733 T7 73 73 MCI OAK		
Т7	77:	2			0 35 763 7 67				30 ERI 17 3052	15 ⊃		) 35 CR7 0130 10130	39	39 772 344

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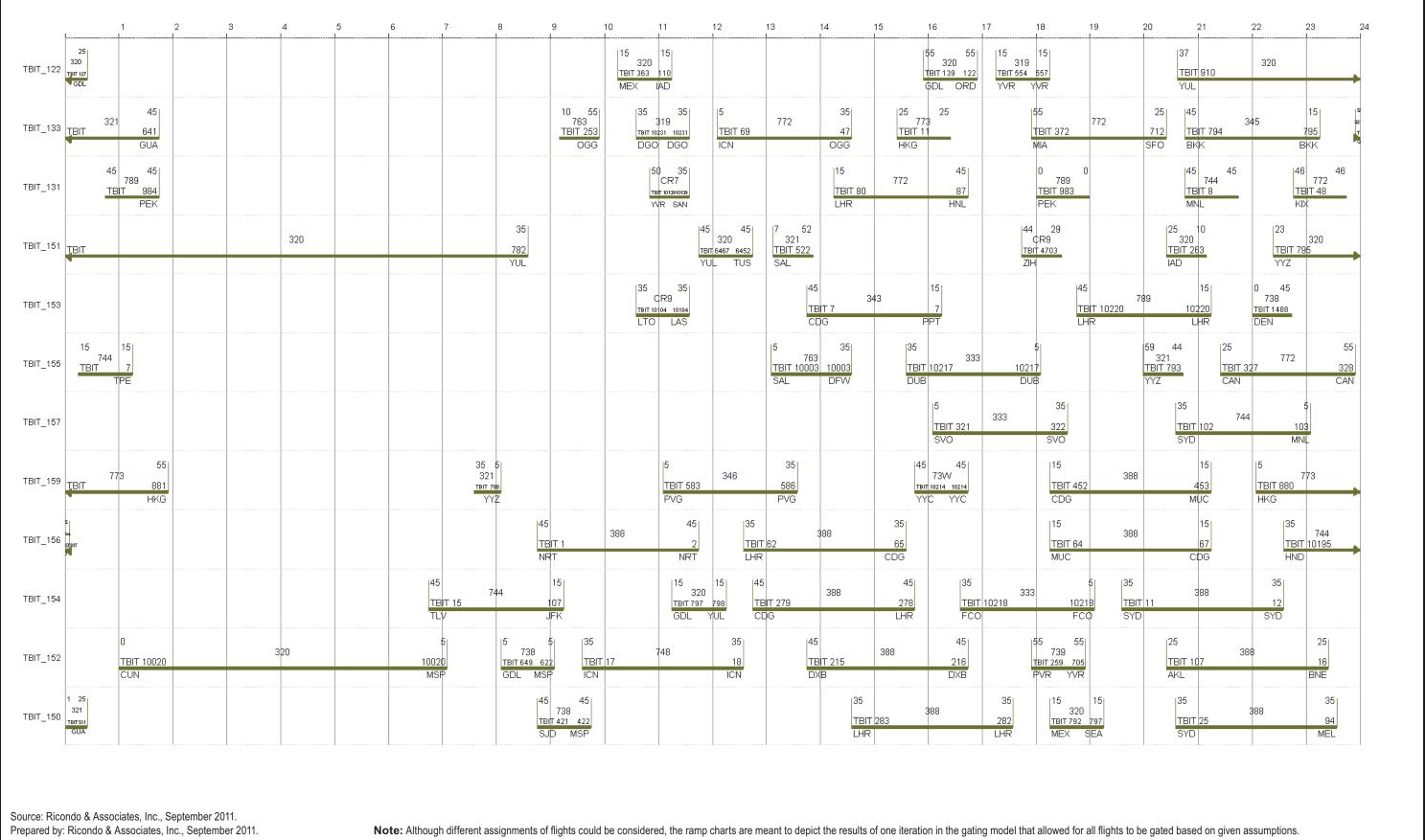


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в	7			73VV			253 HO				40 7 T7	25 52 878 SFO						25 7 T7 47 SEA	4 2 P
а <mark>т</mark>	7			320				35 404 JFK		15 739 T7 452 2 SFO	15 72 2ін							35 T7 - SE/	73! 466
0									та	) 35 CR7 10129 10129 RC PRC	20 EM2 18 6279 645 IPL YUN		0 45 EM2 18 6202 6327 CLD SAN						
I							T8 102	35 320 23 10223 MEX	20 EM2 18 6314 630 MRY PSI		T8 616	M2 12 6288	50 35 CR7 19 10187 10187 MOD MOD	15 45 320 18 6219 DFW				5 CR9 18 10017 10 MEM ME	
2								30 EM 18 6299 OXR	6279	30 EM2 78 6368 SBA (	6202		1	50 35 EM2 18 6282 6329 YK SAN		20 EM2 18 6385 61 SBP B	69	140 18 MF	EN 3291
3								30 EM 18 6467 SMX	12 6322		15 E90 T8 450 MCI	15 350 MCI	T8 244	₹9 3 2316 ·	50 35 EM2 18 6326 6066 DINT FAT	10 55 EM2 18 6329 6397 SAN SBP		10 55 EM2 13 6297 6206 OXR CLD	
4	8			320			35 21 PHX	20 CR7 18 2467 24 STS ST	74	15 320 320 T8 797 809 LAS CUN		55 55 CR9 18 4793 4794 PHX PHX	Т	5 45 733 3 2708 2708 JC TUS		20 CR7 18 10119 10 PDX PE	119 1	50 35 EM2 8 6335 6249 SAN FAT	
5								0 45 CR7 18 6100 6061 SAN PDX	30 CR 18 6076 SUN	6114	18	) 35 CR7 6473 5818 3Q SEA		20 EM2 18 6455 6 YUM S4	422 T8 5	25 CR7 996 6464 T ASE		0 45 CR7 19 10163 10163 SJC SJC	
6						E T8 62	25 M2 1 6320 SAN		0 35 EM2 9 6239 6379 AT SBP			20 СR7 та 1008а т СМНС1	1068			Т	50 35 EM2 8 10191 10191 DINT ONT		
7							15 45 320 T8 903 MEX		10 55 EM2 18 10174 10174 BFL BFL	3	5 55 319 18 403 400 DEN DEN	25 7 T8 34 AUS	33	55 55 319 78 928 937 \$FO SFO	EM2 T8 6163 6	335	25 3 T8 41 DEN	7 412	
8							גד	0 35 CR7 86465 6466 LC SLC	0 45 CR7 19 10162 10162 SJC SMF	20 ( CR7 178 10082 1008 ASE ASI	e T8	] 35 CR7 6429 6138 3P TUL	0 45 CR7 18 6119 6522 TUS PHX		20 CR7 18 6229 6 DFW S	431	0 45 CR7 Ta 10087 10087 COS COS		
3						35 738 твп зе SFC				45 ТВІ	45 319 T 550 553 R YVR		15 76: TBIT 1005 SCL	35 3 0 10050 EWR				5 45 738 IT 1947 1900 JD SFO	

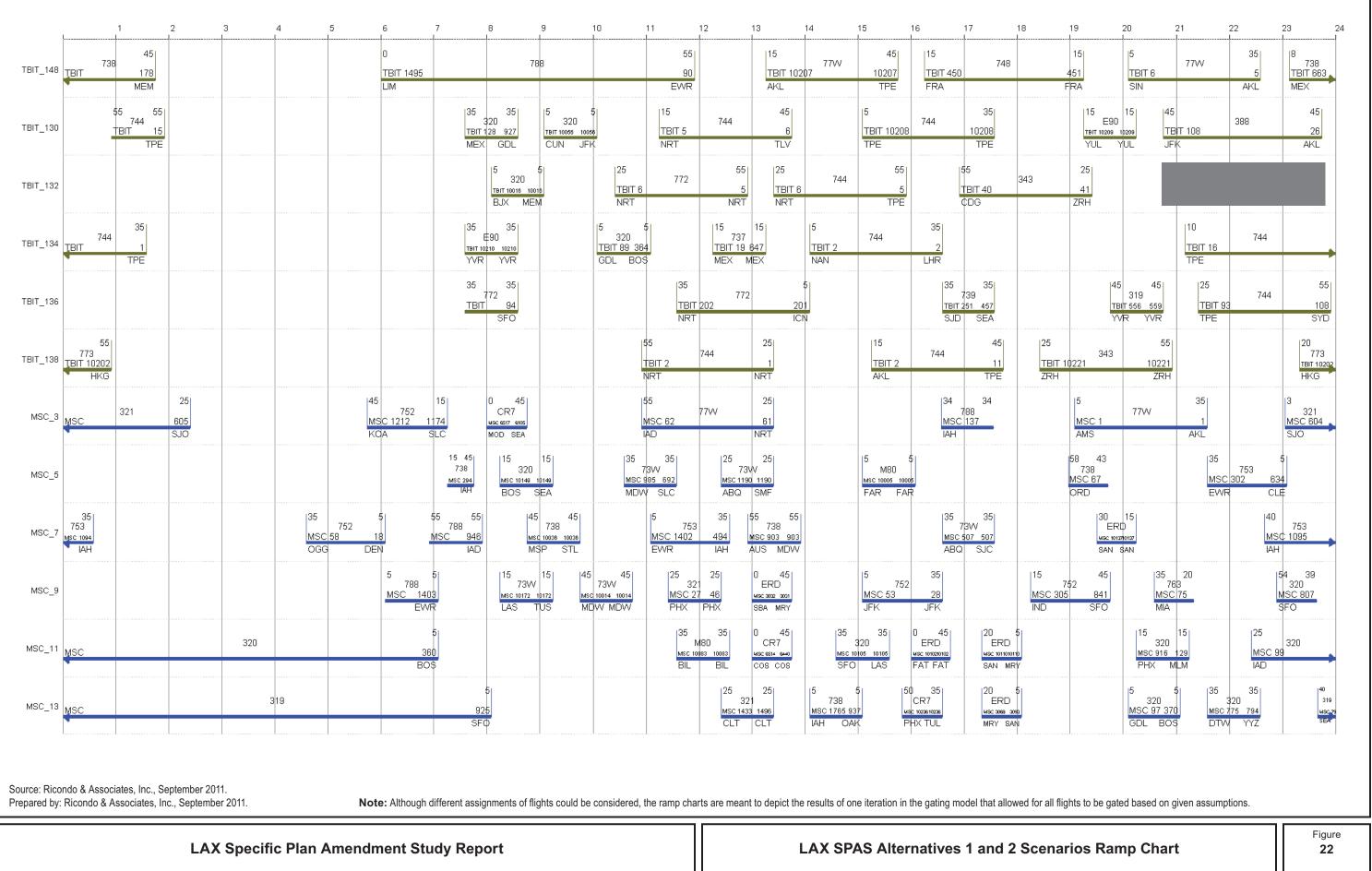
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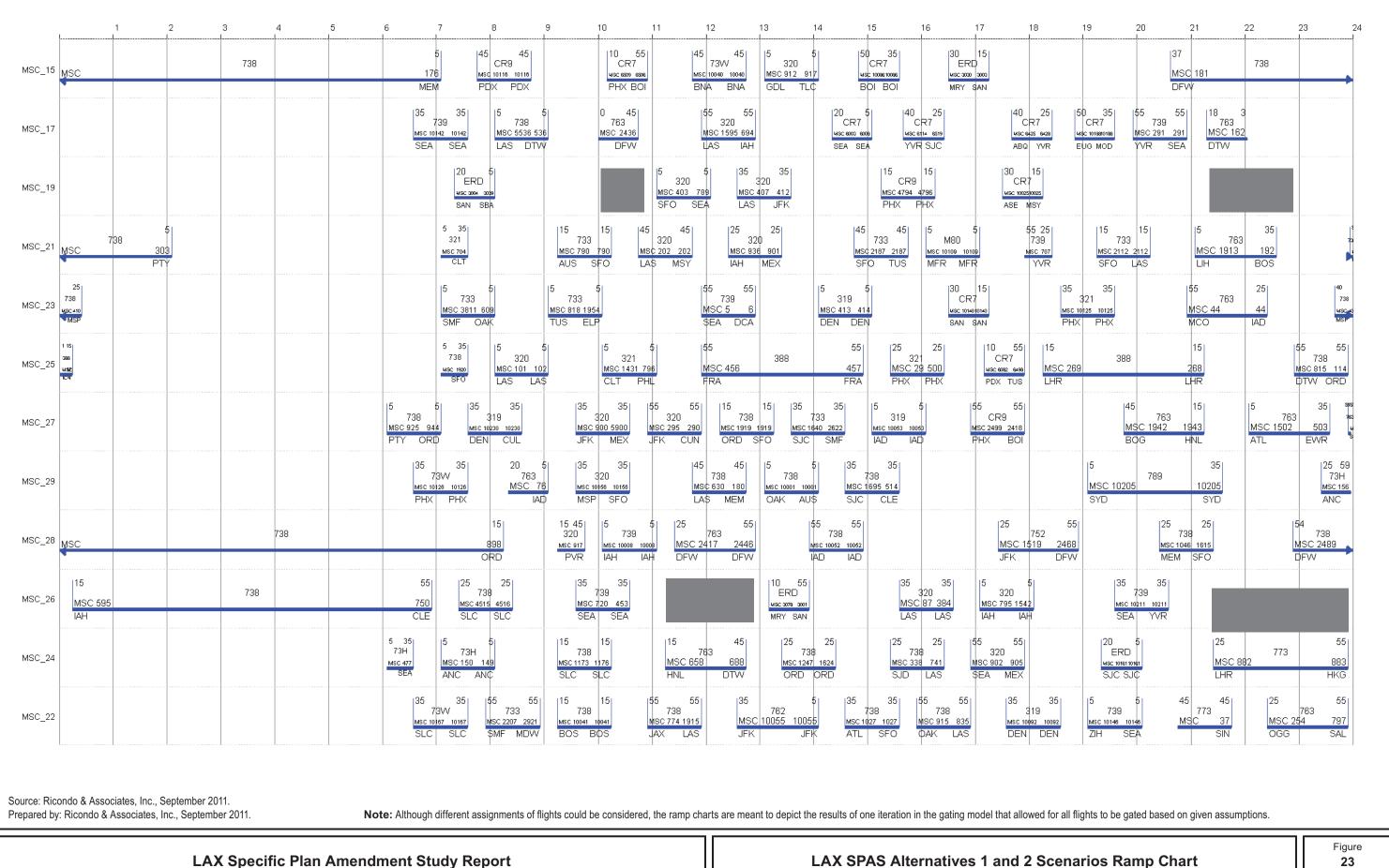
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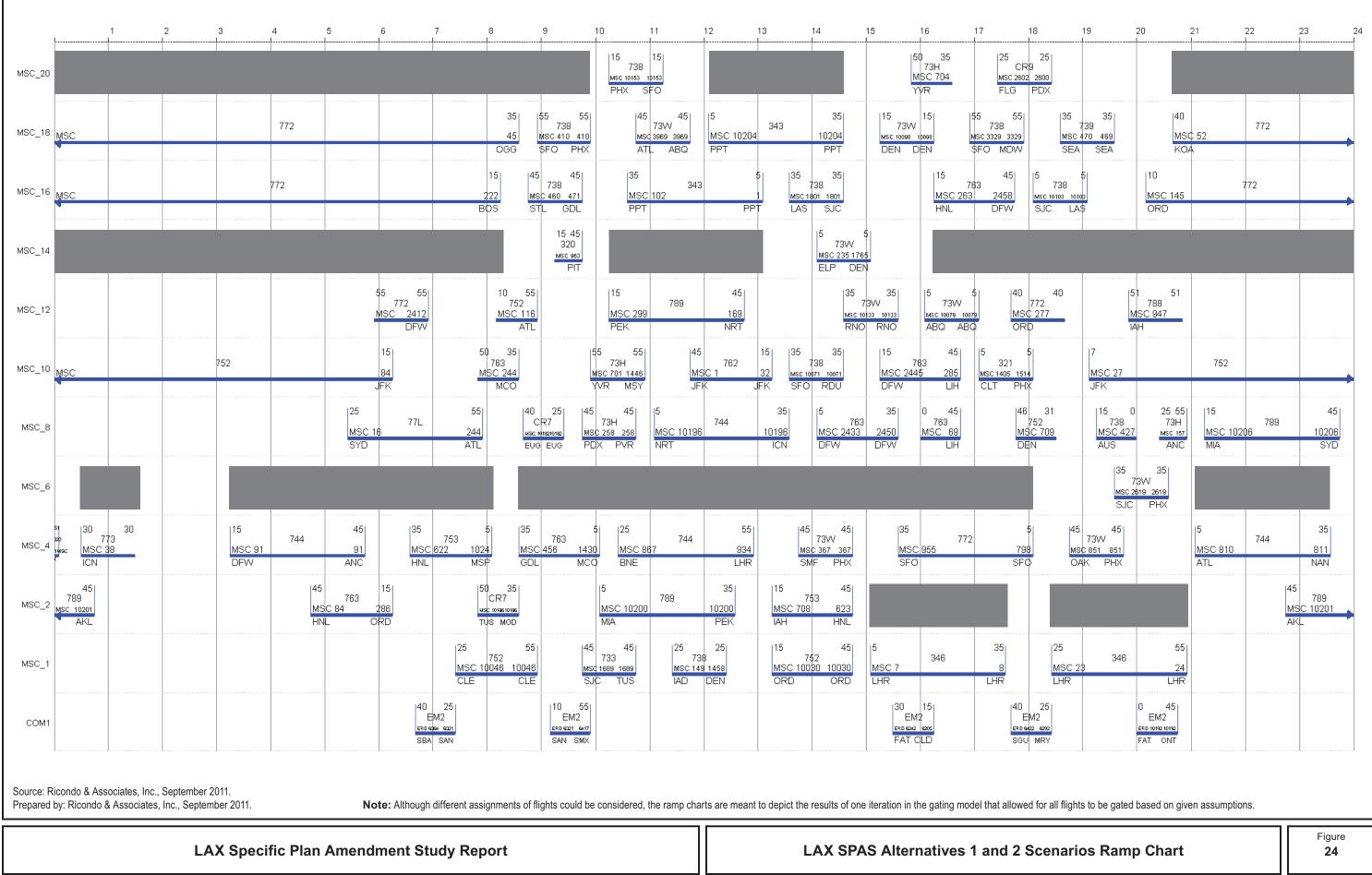


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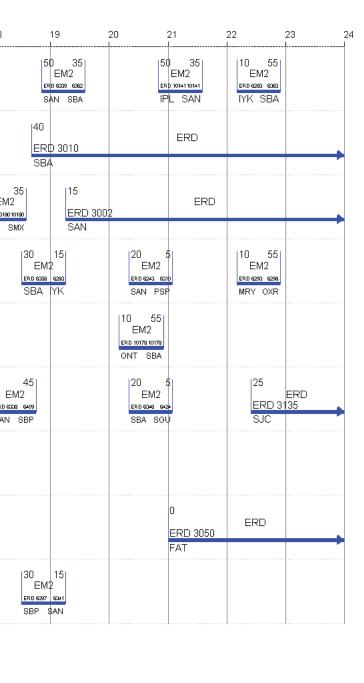


1	2 3 4	5 6 7	8 9 10	D 11 12 13	14 15 16	17 18
СОМ2		E	EM2 RD 64-02 6246	) 45 50 3 EM2 EM2 RD 6222 6555 ERD 6200 64 AN SBA CLD SM	5	
COM3 ERD	ERD	15 3193 SJC	30 15 EM2 ERD 1011110111 PSP MRY	50 35 EM2 ER0 2534 2530 MRY CLD	20 5 EM2 ERD 1017710177 SBA SBA	
COM4 ERD	ERD	55 3025 SAN	0 45 EM2 ERD 6200 6223 CLD SAN	50 35 EM2 ERP 00390099 ONT ONT	10 55 EM2 ERD 6256 6204 MRY CLD	50 3 EM2 ERP 1018010 SMX SM
COM5				20 5 EM2 END 6208 6202 OXR IYK	30 15 50 35 EM2 ERD ERD 6255 6005 ERD 5002 5007 OXR PSP SBA SBA	
СОМ6				0 45 EM2 ERD 9417 6295 SMX OXR	ERD	5 EM2 come cose o SBA
COM7 ERD		ERD	1 301 FA		30 15 EM2 ERD 6227 6357 SAN \$BA	0 EN ERD 6005 SAN
СОМВ			10 15 EM2 80 6400 6354 UM \$BA		30 15 EM2 ERD 0444 6039 SMX SAN	
COM9 ERD	ERD	15 3131 SJC	10 55 EM2 580 5325 6236 SAN OXR	20 5 EM2 EN2 502 SAN PSP	0 45 EM2 ERD 6241 6291 FAT MRY	20 5 EM2 ERD 6475 6280 YUM IPL
СОМ10		40 25 EM2 E50 5312 6200 PSP CLD			50 35 EM2 ERD 10190 10190 SAN ONT	

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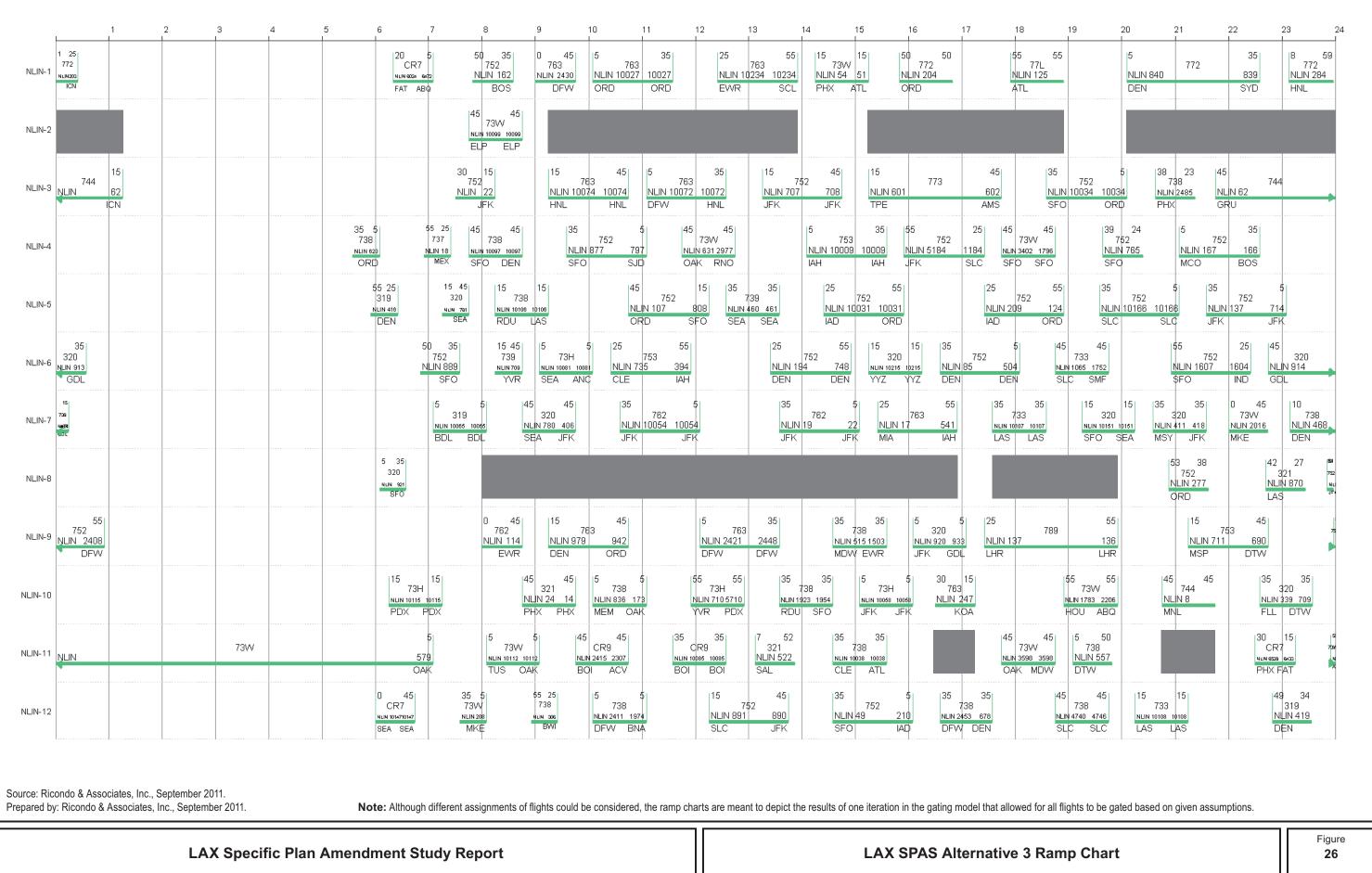
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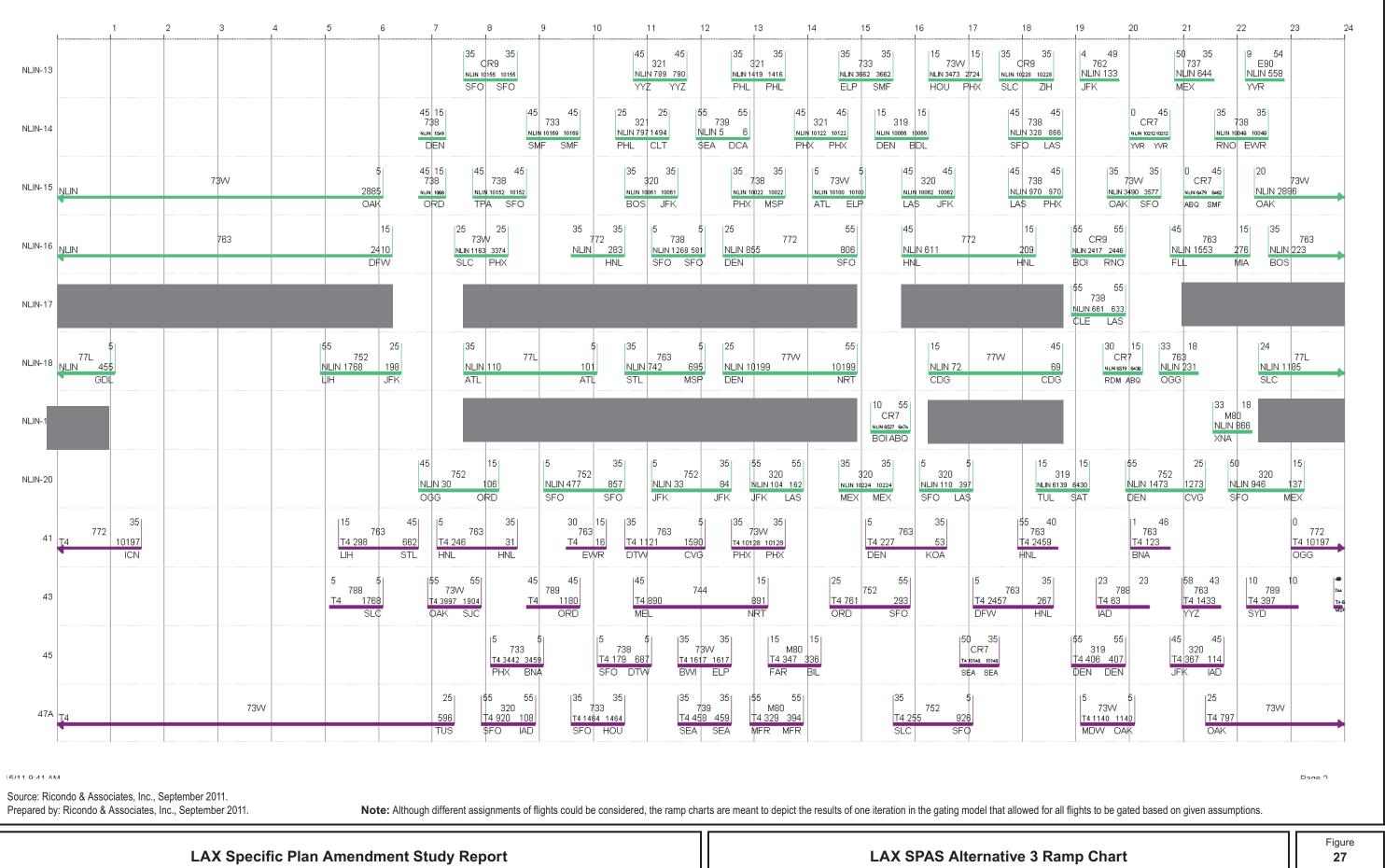
LAX SPAS Alternatives 1 and 2 Sce

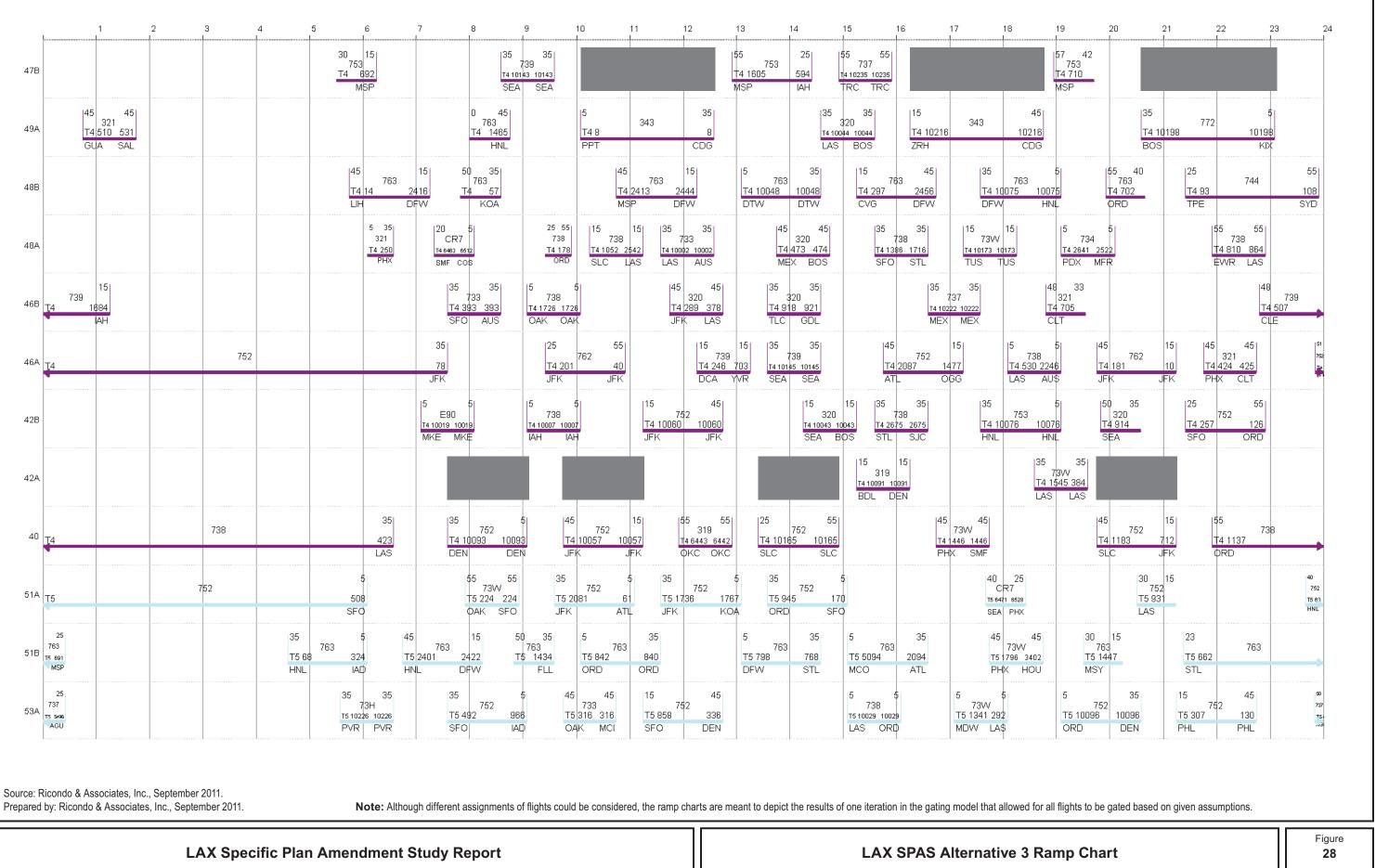


enarios	Ramp	Chart
		•••••

Figure 25







		1 :	2 3	4		5	6	7	8	9 1	10	11	12	13	14	15	16	17	18
53B								50 35 CR7 15 6435 6234 SAT DFW	23 T5 261 IAD	45 752 954 SFO	T5 2	/3VV 17 349 MKE	55 55 738 75 813 1308 AUS AUS	319 T5 552 5	55		739 34 467	5 5 CR9 T5 10024 10024 MSY MSY	-
55A <sub>T</sub>	т5				762					35 2 JFK	40 7 T5	25 52 61 HNL	15 738 75 10028 11 MSP O	0028 T5	45 733 2964 2964 O AUS		15 75 T5 5621 MSP		
57						5 5 788 T5 1212 ATL		15 7 75 4 DFVV	45 63 1 HNL	25 T5 170 IAH	772	55 1520 MIA	T5 100	35 738 006 10006 HOU	25 32  T5 784 BOS	0 416	5 ( 73W T5 10113 1011 OAK OAł	3	24 763 T5 65 HNL
59								55 55 CR9 T5 4799 4793 PHX PHX	20 753 T5 159- IAI	4	5 73VV T5 173 83 LAS SMI		752 1735 1	15 180 SLC	l T5 100	35 90 12 10012 MCI	3 T5 101	35 320 50 10150 SEA	15 320 75 10225 PVR
58	45 T5	744				789 T5 4		T5 3	35 73VV 682 503 I SLC			55 T5 600 AH	788	25 601 LIM			763 70 29 HNI		5
56										15 738 T5 2099 8 ORD OF	36				15 CR9 T5 2425 2 MFR R	444 NO			
54B T	320 T5	35 907 ZCL							15 45 321 T5 754 PHL			5 73W T5 1714 171 BNA OA	<b>4</b> тз Қ S	0 35 CR7 10182 10182 SJC SJC	TS	0 35 CR7 10121 10121 HX PHX	25 T5 100: ORD	55 752 32 10032 ORD	25 7 T5 165 PHX
54A <sub>T</sub>	Г5			321				5 742 A\$		55 55 738 T5 1929 1928 DEN SFO	Т5	45 320 103 105 K LAS	15 738 T5 605 SFO L	605				20 5 CR7 15 10181 1018 STS STS	
52A								-	0 35 763 5 1703 EWR		25 T5 25 BOS		Т5	45 73W 884 885 7C YYC			15 78 T5 1477 ATL	1467	
50B T	гэ		73//				32	50 35 СR7 тs10087 10087 СМН СМН		45 320 947 949 A CUN	30 CR 15 2705 PHX	2820	5 73W 75 10078 1007 ABQ ABC	78 T5 100	R9 80 10080 -	55 55 73H 75 1179 1182 \$LC SLC		45 737 10232 10232 3C PBC	35 T5 1 MC
61	130 T6 185 JFK	5		762				5   18  FK	25 T6 103 ORD	55 752 272 MCO		25 T6 888 DEN	55 752 236 IAD		145 T6 JF	762 3 1	15 180 FK	35 T6 94 ORD	
63	55 763 7 <u>6 2078</u> ATL					35 5 738 <u>T6 35</u> 3 LA\$			145 T6 AL	752 1479	15   45 32   <u>T6</u> FK DE	738 1469 812	15 752 <u>T6 817</u> SFO	35 116 ORD		45 73W 2904 2904 K ABQ	15 738 <u>T613451</u> MEM O		15 75 <u>T6 10010</u> IAH

11 9:41 AM

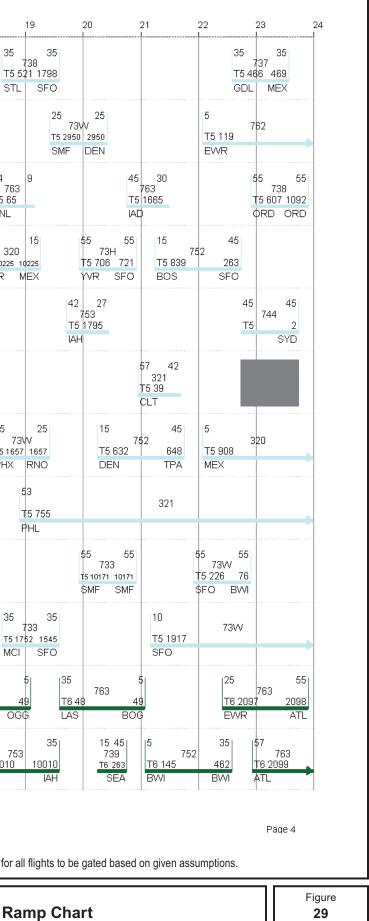
Source: Ricondo & Associates, Inc., September 2011.

Prepared by: Ricondo & Associates, Inc., September 2011.

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LAX SPAS Alternative 3 Ramp Chart



1	2 3	4	5 6	7 8	q	10	11 1	2	13	14	15	16	17	18
65			5 35 752 76 46 46 KOA DEN	35 35 73W <u>76 3922 3922</u> RNO SMF	15	45 52 89 OGG			5 752 T6 2085 ATL	351	25 73 T6 10170 SMF	25 3 10170	15 ( 73W T6 1566 1341 SLC OAk	5 3 1 T
77			50 35 752 <u>T6 90</u> SFO	55   738  Т6 628    ФТ√V   L	629 T6 272	45 52 856 IAD	44  75  Т6 В  SFФ	52 3			тө	45 738 449 1563 X SFO		
78			M80 <u>T6 346</u> TE	738 7	763 280 те 100	35 738 51 10051 IAD	T6 2	45 73VV 2977 631 SAT	5 5 733 T6 2445 82 RNO OAP	2 T6 25	35 39 2 465 SEA		15 738 <u>T6 737</u> 8 SFO M	
9A			5 763 <u>T6 286</u> KOA	35 202 MIA		0 45 763 <u>T6 3</u> HNL	5 5 318 <u>76 10026 10026</u> OMA OMA	T6 1	45 738 <u>0037 10037</u> _ ATL		15 <u>T6 2</u> AKL	744	45 11 TPE	
<sup>19B</sup> T6	73н		5 561 PDX		35 35 738 T6 10227 10227 LAS SJD	15 319 <u>T6 8594 859</u> YEG YE	95 те ю	35 CR7 1132 10132 0 RN0	15 5 73W T6 82 2445 PHX BN4		15 E90 T6 570 YYC Y		Тб	0 35 CR7 55818 6071 1SY PDX
18A T6	73₩		55 1288 MDW	35 35 319 <u>16 10089 10089</u> CUL DEN	55 55 733 <u>T6 620 818</u> ELP SJC		55 55 738 T6 10069 10069 LAS JAX		35 T6 93 NRT	772 5	94 DEI			2
88				10 CR 16 2497 SMF F	7 2330	55 55 E90 T6 568 571 YYC YYC	7[3 	3 10023						
66 <sub>T6</sub>		738		4 19 PH		T6 28	CR9 305 2601	15 5 73VV T6 3361 336 TUS OAł	T6 1	45 733 0160 10160 K SFO			27 738 798	
64 <sub>T6</sub>	321		35 1418 PHL	738 T6 10088 10088 T6	25 73W 1075 1075 O ABQ	5 73VV <u>16 10039 1003</u> ATL AT	39	15 737 <u>T6 19</u> 6 MEX M	347		45 738 1892 418 D PHX	тб	45 73W 1900 2279 \$ DEN	124 T6 PH
62 <sub>T6</sub>	763		68 DTv	6	35 35 73VV T6 10045 10045 BVVI BVVI	5 35 738 T6 733 LAS	15 763 T6 2083 ATL	45 3 152 ATL	-	5 55 738 6 2196 144 1DVV IAD		55 55 CR9 16 2837 2880 TO PHX	15 320 T6 936 9 SFO SI	945
60 <sub>16</sub>	319		55 		Т6 1	35 738 002 556 CLE	15 1 73VV <u>16 10164 1010</u> SJC SJ	64	5 55 73H 6 922 923 ⁄EG YEG	25 733 76 1696 TUS	1696 те	35 CR7 8522 6491 UL SMF	125 733 T6 844 ELP	13
35 5 320 77 139 MEX				CR7 17 6523 6499 T7	319 401 104 п	0 35 CR7 10120 10120 US PHX	25 319 T7 924 SFO S	929	5 5 319 17 10090 1009 YVR DEN	3 ) 17 1012	35 121 23 10123 PHX	T7 100	35 321 047 10047 CLT	

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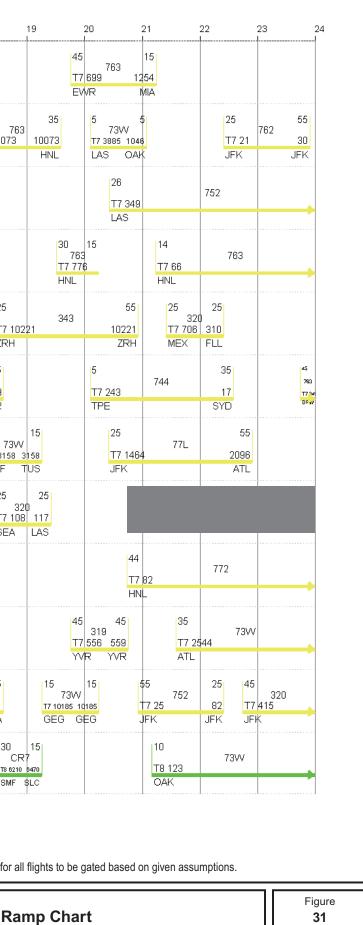
LAX SPAS Alternative 3 Ramp Chart

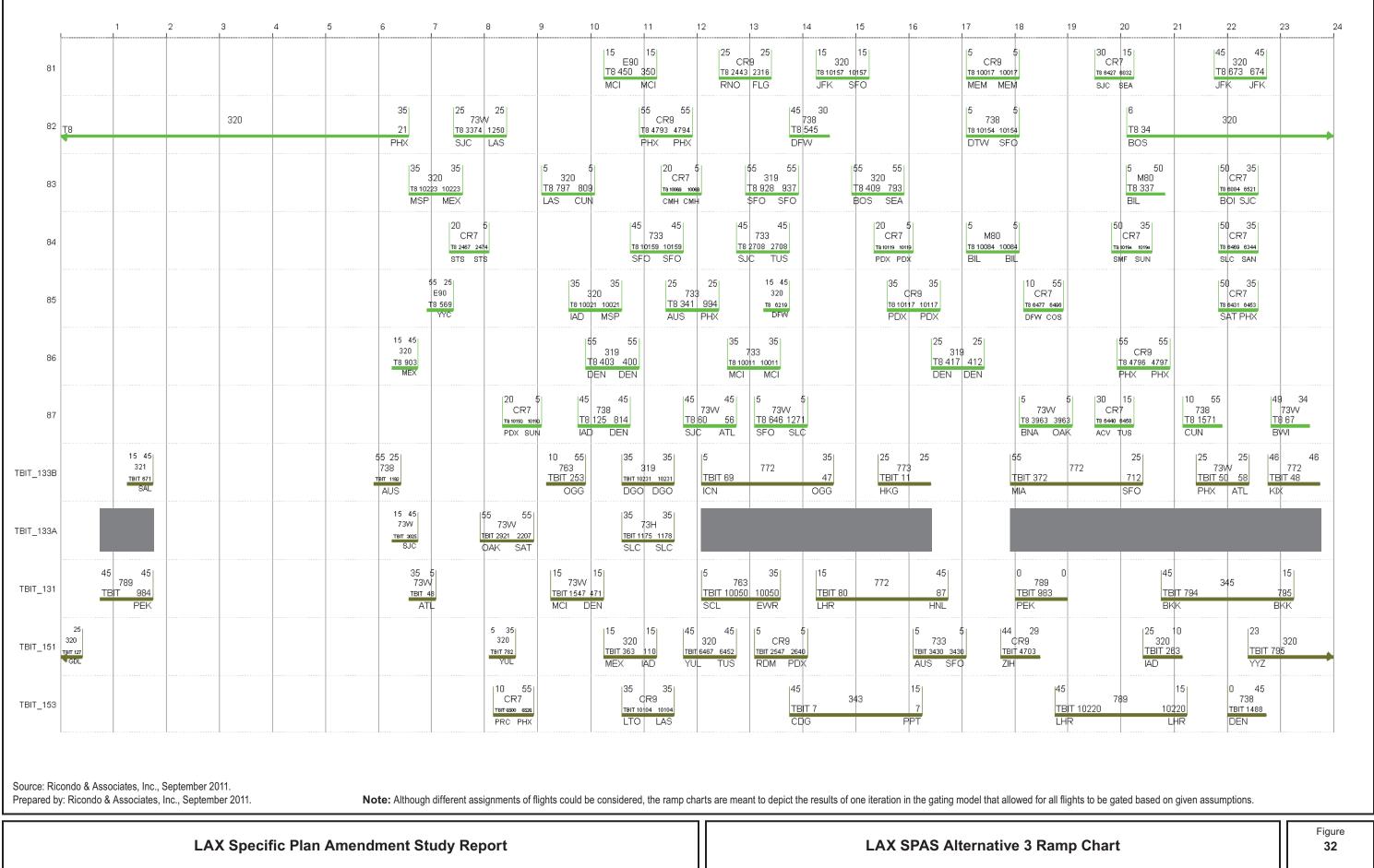


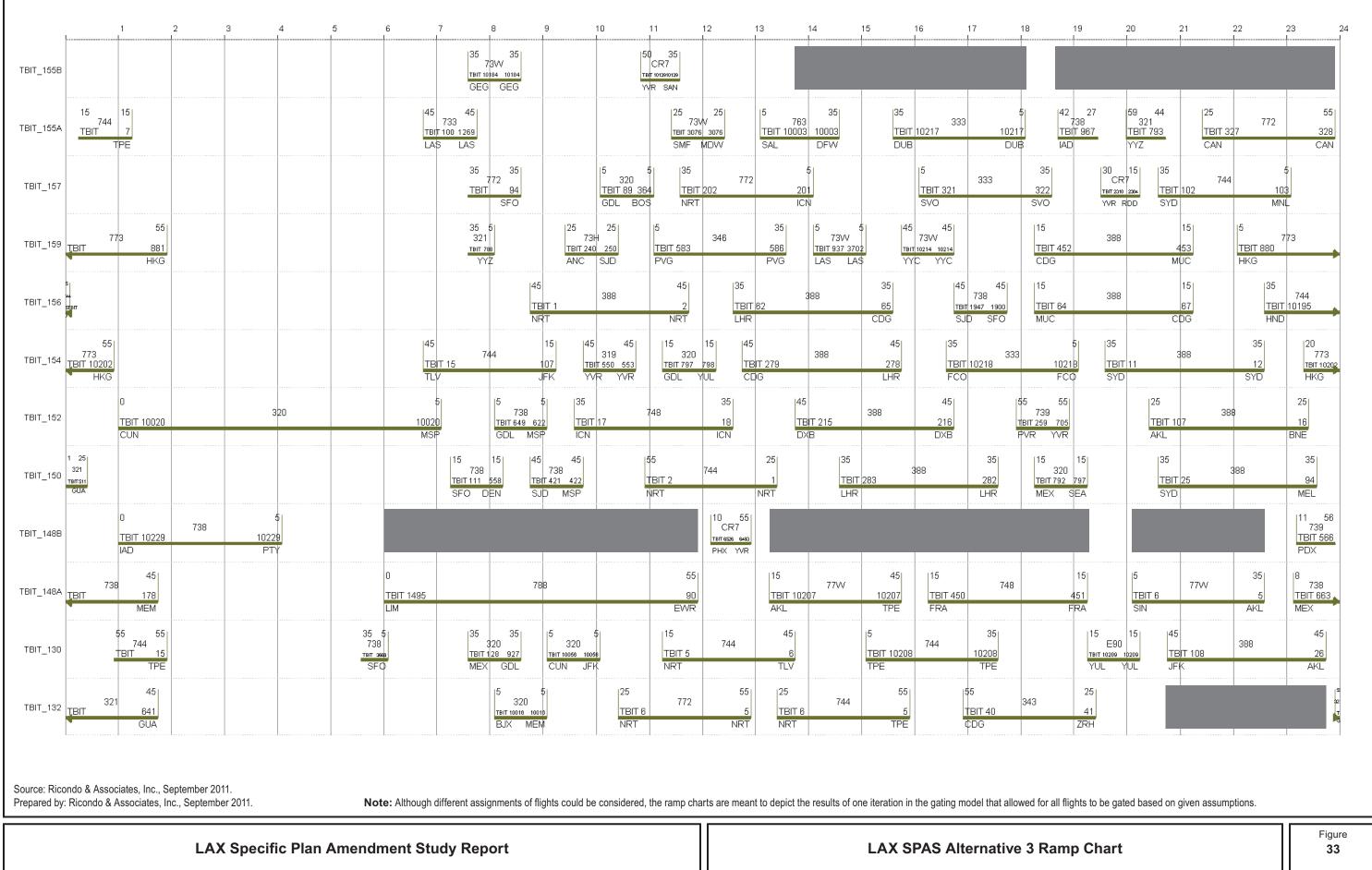
1 2	3 4	5 6	7	8 9	10 11	12 13	14 15	16 17	18
718				0 35 762 7 34 JFK	15 45 763 T7 417 2440 CVG DFW	5 763 T7 271 MIA	252 T	5 45 8 53 738 762 7 223 223 T7 117 RD PHX JFK	
73		55 25 763 T7 12 194 ØGG IAH	73VV 4 T7 10013 10013	763 T7 2407 1	15 35 35 739 586 17 10144 10144 YYZ SEA SEA	0 45 25 CR7 17 10077 10077 T7 669 ABQ ABQ DTVV		55 3 <sup>763</sup> 3 161 OGG	5 76 T7 10073 EWR
75A T7	752	15 1540 CVG		15 45 752 T7 311 237 OGG SJD		752 7531 118	320 T7 910 915	51 36 752 T7 1181 DEN	
75B T7	763			25 55 752 2428 T7 10059 DFW MCO	25 50 35 CR7 10059 17 6315 6247 JFK SAN FAT		5 763 7725 726 OS BOS	25 55 763 177 10 9 IAD HNL	
77 1 25 744 77 2 SYD			35 T7 4 ICN		5 0 45 CR7 3 17 6499 6065 L SJC PDX	15 744 T7 12 ICN	45 11 NRT	30 30 744 T7 1 TPE	25 T7 10 ZRH
76 <b>15</b> 780 2800 0 W			T7 1	35 5 320 73VV 12 929 T7 1954 227 MEX SMF LA		45 772 10094 DEN	15 15 321 T7 799 796 YYZ YYZ	5 763 T7 10219 LHR	
74				35 772 81 HNL	25 55 752 752 ATL JFK	73VV T7 872 1757	20 5 CR7 17 6376 6477 TUS SMF	35 35 739 T7 251 457 SJD SEA	15 73V T7 3158 SMF
728			M T7	15 180 336 BIL	15 E90 T7 1501 MKE	1500 T7 2200 2201	5 733 T7 73 MCI OA		25 3 T7 10 SEA
72A T7	772			0 35 763 7 67 LIH	35 35 CR9 T7 283 264 LAS LTO		50 35 CR7 17 0100 10100 RDD RDD	39 39 772 T7 844 SFO	
70B <sub>T7</sub>	73VV		5 2537 HOU	15 15 320 17 10042 10042 MEM BOS	40 25 752 T7 878 SFO	35 35 73W 77 10018 10018 MKE MKE	5 5 73W 17 10015 10015 MDVV MDVV	55 55 25 320 73 T7 139 122 T7 474 GDL ORD SEA	
70A T7	320		35 404 JFK	15 739 T7 452 SFO	15 5 73VV 272 T7 55 6 ZIH OAK BV	5 55 55 73W 34 T7 3751 3439 MI HOU LAS			35 739 166 471 A SEA
80 18	73\V		15 1841 SFO	5 5 737 T8 10233 10238 QRO QRO		50 35 CR7 rs jotar MÓD MOD		5 45 733 8 159 159 MF MCI	30 CI 18 621 SMF

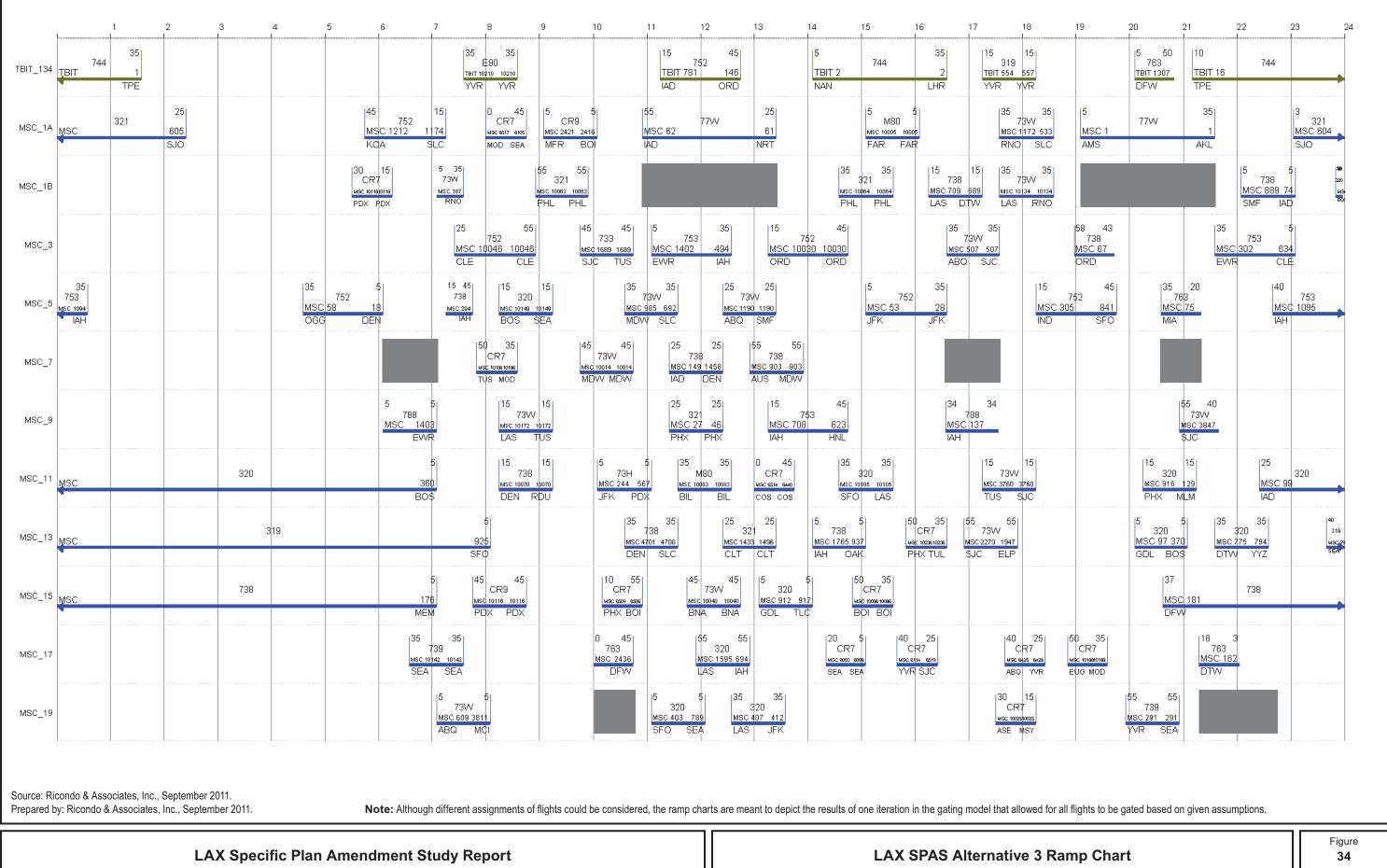
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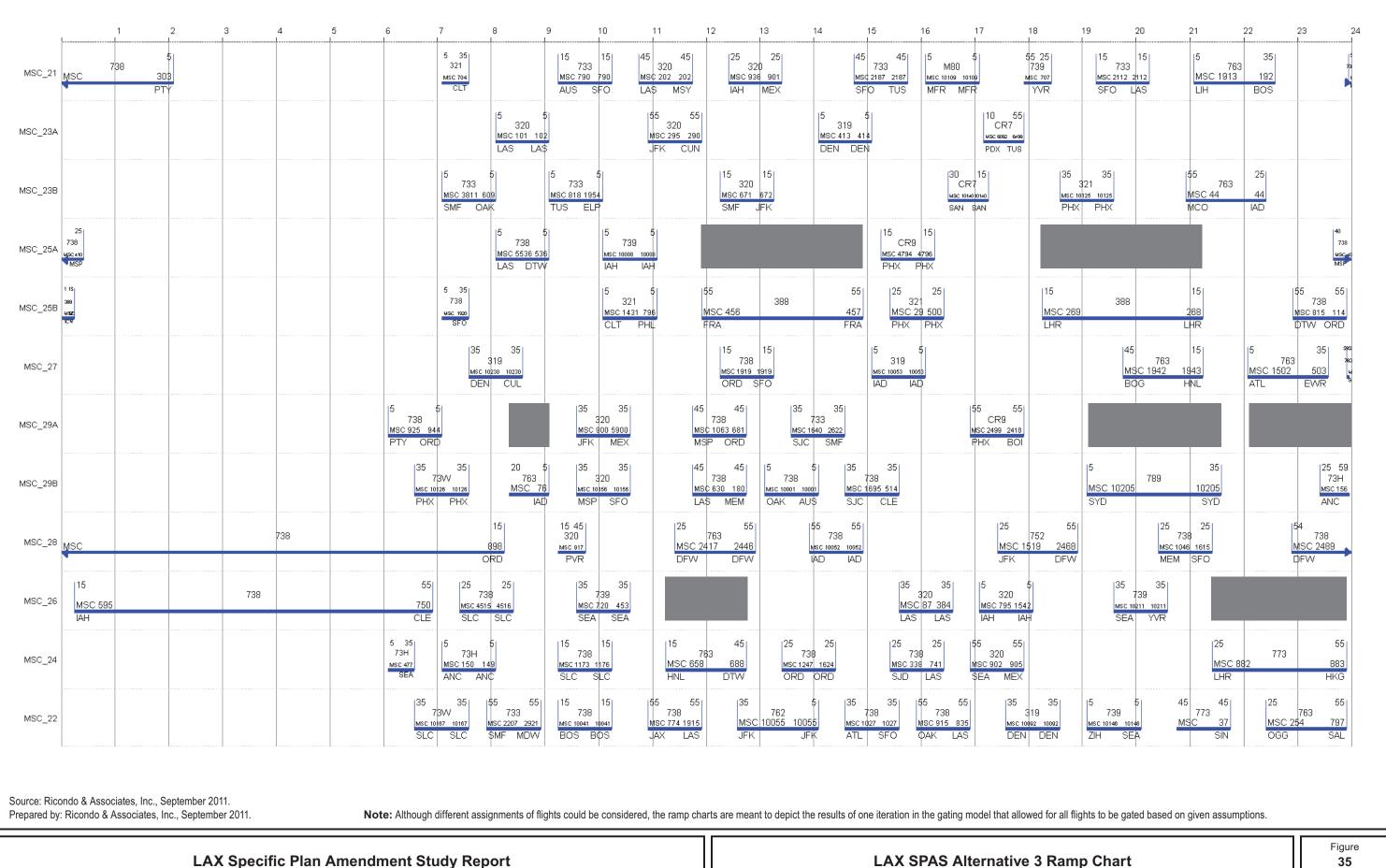
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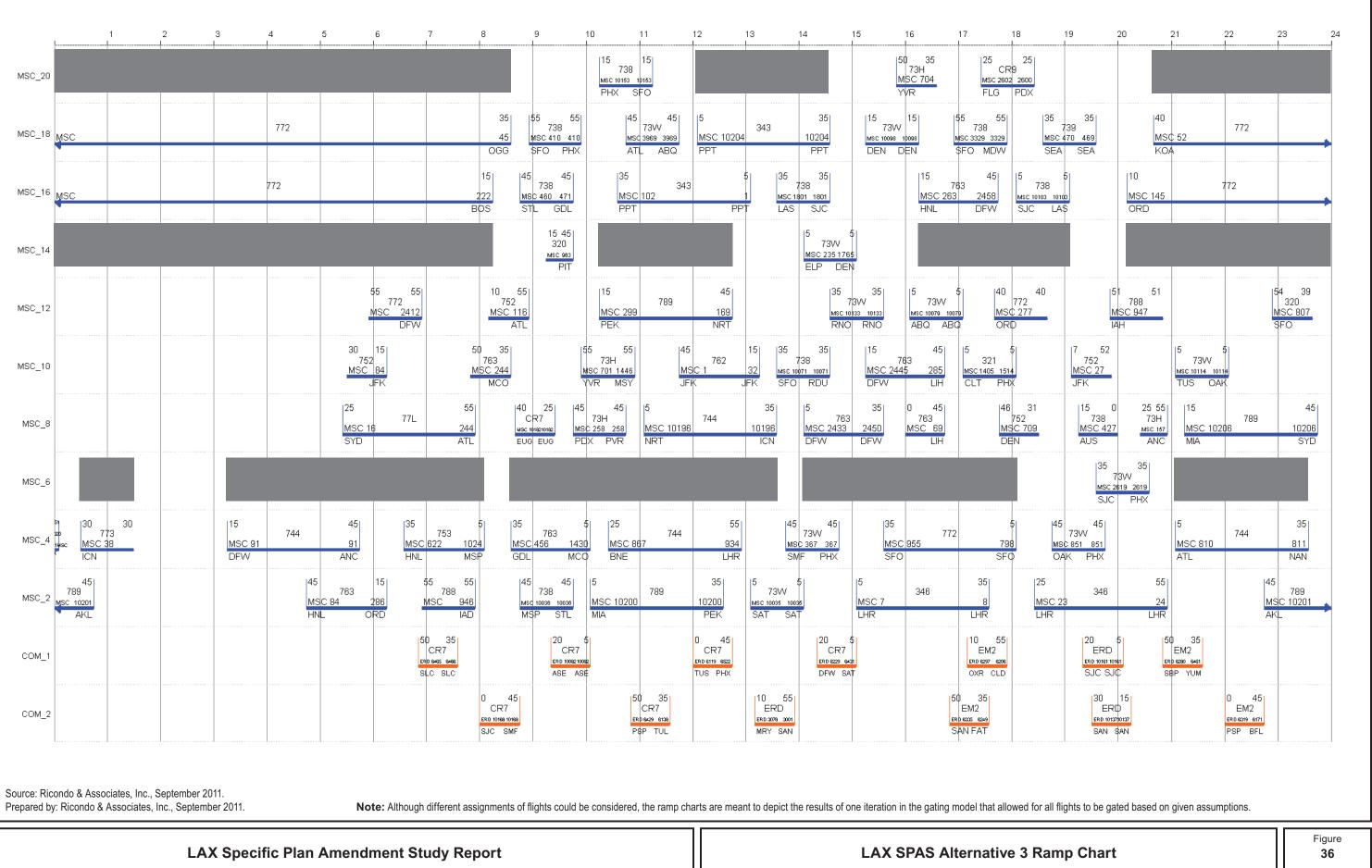








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сом_з	1 2	3	4 5	6 7		50 35 CR7 ERD 10129 10129		1 12	13	14 15	5 16 0 45 CR7 ERD 1000710007	17 18
COM_4				E	45 CR7 80 6100 6061 AN PDX	PRC PRC 30 15 CR7 ERD 0078 6114 SUN ÝVR	ERDE	35 CR7 x23 3919 3 SEA	20 EM2 ERD 9455 8 YUM SC	422 ERD 5995	7 6454	0 45 CR7 ERD 10162 10162 SJC SJC
СОМ_5				40 EM BA SBA	25  2  2	50 35 ERD 50 55 SAN SAN		0 45 ERD ERD 3006 3043 SAN SBA	Ę	0 35 EM2 80 10190 10190	30 ER <u>ER0 300</u> MRY	15 40 25 D EM2 9000 ЕКО 8422 6232
COM_6		ERD		15 40 ЕМ 3193 впо вид SJC PSP	12 2000	30 15 ERD ₅80 3024 3190 SAN \$JC		50 35 ERD ERD 354 SÁN SAN	E	0 35 ERD 80 10175 10175 SJC SBA	40 25 ERD ERD 3000 3000 SAN SAN	4 E S
COM_7		ERD		55 3025 SAN		50 35 ERD FAT FAT	30 1 ERD ERD 2046 20 SAN SA	EM2 erd 6417 6295			10 55 ERD 580 3040 3140 SAN SJC	20 5 ERD 680 3000 MRY SAN
COM_8			ERD				15 13 AT		0 45 ERD 580 3002 3001 SBA MRY	30 1 EM2 ERD 6227 62 SAN \$B	57 ERD 6204 6	359
сом_9					45 ERD RD 10135 10135 AN SAN	10 55 EM2 ERD 6221 6417 SAN SMX		20 5 ERD ERD 3173 3121 SJC SJC	E	0 35 ERD 80 3181 3087 AN SAN	50 35 ERD 58 3007 SBA SBA	
COM_10		ERD		1 318 SJ		E	0 35 ERD 9 3039 3079 BA MRY	20 EM ERD 6225 SAN	2 6042	0 45 EM2 ERD 6241 6291 FAT MRY		20 5 30 EM2 ER0 6475 6280 YUM IPL SJC
сом_11					20 5 ERD ERD 3004 3009 SAN SBA		30 1 ERD 680 3016 30 FAT SB	00 ERD 0	15 RD 5 3021	20 5 ERD ERD 3070 3080 SBA SAN	30 15 EM2 ERD 6006 SMX SAN	50 35 ERD 589 3002 3017 SAN FAT
СОМ_12					40 ER SBA	# 3047 ERD 3175	3007			30 1 ERD 580 3042 30 SBA FA	20	20 5 ERD ERD 00100100 SAN MRY
сом_13				C F	45 ERD 80 3014 3011 AT FAT				50 35 EM2 ERD 6282 6229 IYK SAN		0 45 ERD FAT FAT	0 45 ERD FAT SJC
COM_14						20 5 EM2 ER0 6314 6300 MRY PSP		0 45 EM2 ERD 2022 6127 CLD SAN			50 35 EM2 ERP 10191 10191 ONT ONT	

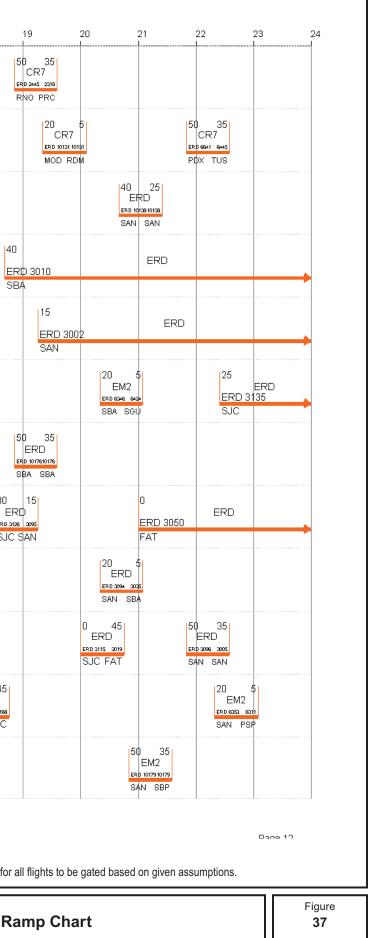
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Source: Ricondo & Associates, Inc., September 2011.

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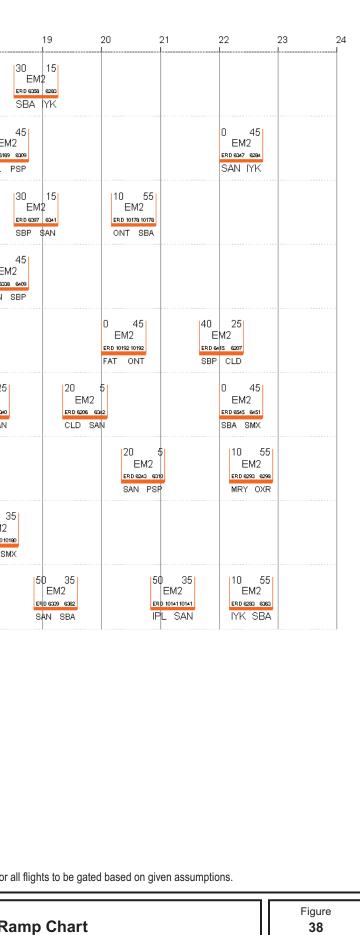
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	4 5 6	7 8 9	10 11	12 13	14 15	16	17	18
СОМ_15		50 35 EM2 دمه دمه FAT SBP			20 5 EM2 END BEL SAN			
COM_16		30 15 EM2 ER0 6457 622 SMX SAN	40 25 EM2 ERD 6152 2009 BFL MRY			30 15 EM2 FRD 6242 6205 FAT CLD		0 EM2 ERD 6169 BFL P
СОМ_17		30 15 EM2 ER0 6422 6246 SGU FAT	50 35 EM2 ERP 2234 2000 MRY CLD		50 35 EM2 EN2 8288 8086 ONT FAT			
COM_18		10 55 EM2 ERD 10174 10174 BFL BFL	20 5 EM2 ERD 6279 6455 IPL YUM					0 EM2 ERD 6338 SAN S
СОМ_19		10 55 EM2 ERD 6200 6296 SAN OXR		50 35 EM2 SAN BFL	ERDO	55 EM2 329 6397 I SBP		
СОМ_20		30 15 EM2 EN0 2009 2009 OXR PL	30 15 EM2 SBA CLD		E	20 5 EM2 RD 6385 6199 BP BFL	E	25 M2 291 8340 ( SAN
COM_21	40 25 EM2 ERD 6261 6220 IYK SAN		20 5 EM2 ERD 6236 6236 OXR IYK		30 15 EM2 ERD 225 2005 OXR PSP			
СОМ_22		30         15         0           EM2         EM2         END           YUM<\$BA	0 6323	50 35 EM2 ERD 1019910189 ONT ONT	10 55 EM2 ERD 2009 2004 MRY CLD		ERC	0 35 EM2 1018010180 MX SMX
СОМ_23		30 15 EM2 ERD 1011110111 PSP MRY	0 45 EM2 ERD 6222 6035 SAN SBA	50 35 EM2 EN2 CLD SMX	E	20 5 EM2 RD 1017710177 BA SBA		

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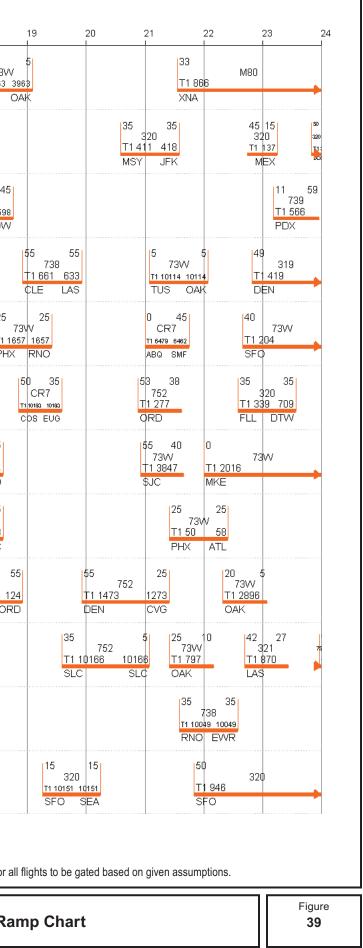
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1	2 3 4	56	7 8 9	10 11	12 13	14 15	16 17 18
1 <sub>T1</sub>	M80		15 336 BIL	35 35 320 11 10061 10061 BOS JFK	55 55 73H T1 922 923 YEG YEG		45 5 733 7 159 159 F MCI BNA
3 T1	320		781 T1 100	55 35 35 321 738 63 10063 T1 4701 4700 PHL DEN SLC	35 35 321 T1 1419 1416 PHL PHL		15 15 320 T1 936 945 SFO SFO
5			0 35 55 55 73VV 73VV 1 187 T1 2921 2207 RNO ØAK SAT	15 15 738 T1 1052 2542 SLC LAS	35 35 738 11 10022 10022 PHX MSP	45 45 73VV T1 2904 2904 OAK ABQ	5 5 45 320 73VV T1 920 933 T1 3598 3 JFK GDL OAK MI
7 T1	319	25 416 DEN	5 5 25 25 73W 73W T1 609 3811 T1 1075 1075 ABQ M¢I SFO ABC	73W 5 T1 173 836	45 45 73VV T1 60 56 SJÇ ATL	5 5 73VV T1 10015 10015 MDVV MDVV	5 5 73W T1 1341 292 MDW LA\$
9 T1	73\V	579 OAł			15 15 738 T1 605 605 SFO LAS	5 5 73W T1 937 3702 LAS LA\$	5 5 M80 T1 10084 10084 BIL BIL
11		35 5 73W 11 2885 OAK	50 35 752 T1 162 BOS	45 45 5 738 7 T1 125 814 T1 33 IAD DEN JFK	35 25 52 84 T1 194 JFK DEN	55 752 748 DEN	55 55 73W T1 2279 1947 \$JC ELP
13 T1	73W	45 3025 SJC	738 T1 10152 10152 T	5 15 35 35 73W 73H 11 1547 471 <u>11 1175 1178</u> 4CI DEN SLC SLC	5 73W 73W T1 646 127 SFO SLO		
14		15 73H 11 10115 10 PDX P	73VV 115 T1 10112 10112	25 25 73H T1 240 250 ANC SJD	55 55 73H T1 710 5710 YVR PDX	5 5 73H T1 10058 1005 JFK JFK	
12			T1 10184 10184 T1 1	5 5 73H 738 0081 10081 A ANC SFO S			5 5 25 73W T1 10113 10113 OAK OAK IAD
10 752 T1 2408 DFW		752 T1 1768 198 т	55 55 15 45 73W 739 11 3997 1904 <u>11 709</u> DAK SJC YVR	35 5 752 5 T1 877 797 SFO SJD	15 45 752 752 T1 891 890 SLC JFK		55 25 752 [1 5184 1184 FK SLC
8			15 15 35 738 738 738 T1 111 558 T1 10227 10 SFO DEN LAS S	738 1227 T1 2411 1974	45 45 5 733 738 733 T1 1063 681 T1 2445 8: MSP ORD RNO OAF		35 35 738 T1 2453 678 DFW DEN
6 <sub>T1</sub>	320	35 921 SFO	15 15 320 T1 10042 10042 MEM BQS	35 35 15 320 E9 11 10021 10021 T1 1501 IAD MSP MKE	0 320 1500 T1 104 162	15 320 T1 10215 10 YYZ	

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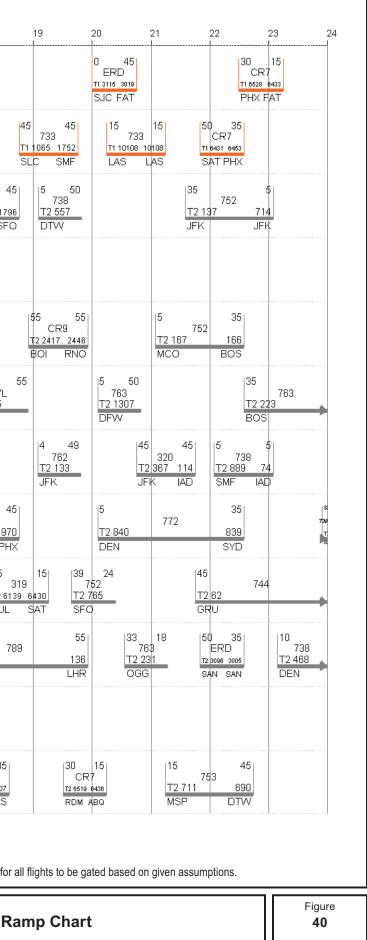
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4B						20 CR7 11 6024 647 FAT AB	72 T1 10	35 R9 55 10155 SFO	30 ERI 11 3175 SJC 5	) 3007		CR9 085 10085			10 55 ERD T1 3048 3140 SAN SJC			
4A							45 733 100 1269 S LAS		5 45 733 10169 10169 MF SMF	Т1	5 45 733 10159 10159 FO SFO	10 55 CR7 11 6526 6483 PHX YVR						
21					35 5 738 <u>T2 62</u> ORE	3	5 E90 <u>12 10019 100</u> MKE MK		5 CR9 <u>T2 2421 241</u> MFR BC	6 T2 2	35 CR9 263 264 5 LTO	15 E90 T2 10213 1 YYC	0213	T2 10	35 321 0064 10064 - PHL	5 320 <u>T2 110</u> 39 SFO LA	7	45 4 73VV <u>T2 3402 179</u> SFO SFC
218								10 55 CR7 12 6500 6526 PRC PHX	Т	45 733 2 <u>316 316</u> 4K MCI	T	0 35 CR7 2 10132 10132 2 1NO RNO	Т	5 30 738 2 545 FVV	55 55 320 T2 409 793 BOS SEA	738 T2 709	689	
23							0 35 752 2 889 SFO	30 ER 12 3024 SAN	D \$190 T2 1	35 738 002 556 CLE		T2 100	35 73VV 918 10018 MKE	15 320 12 10157 JFK	10157 T2	5 45 320 10062 10062 \$ JFK		
25 T2			763		24	15 10 W	5 319 72 10065 100 BDL BD		-	35  T2 7  STL	763 742 69		5 73VV <u>T2 10035_100</u> SAT SA	35 T2 :	35 738 515 1503 W EWR			55 77L T2 125 ATL
27					т	5 25 738 21182 AUS		0 45 762 T2 114 EWR	-	5 73VV 12 10039 100 ATL AT	39 T2-4	739 58 459	55 55 M80 T2 329 394 MFR MFR		T2 28	35 738 575 2675 SJC		
28 T2				73VV			20 		15 7 T2 10074 HNL	45 63 10074 HNL	15 7 T2 781 IAD			5   75   <u>T2 10009</u>   IAH	35 3 10009 IAH	30 763 <u>T2</u> K	247	45 4 738 T2 970 97 LA\$ PH
<sup>26</sup> T2	744 62 ICN					45 7 <u>12</u>	15 35 38 1549 T2 1 2EN ATL	77L 10	- 10 AT		15 763 T2 10072 DFW	35 10072 HNL	15 7 <u>T2 707</u> JFK	45 752 708 JFK	15 T2 601 TPE	773	45 602 AMS	T2 61
15 739 739 739 739 739 739 739 739 739 739									0 45 763 T2 2430 DFW		5 45 321 2 789 790 YZ YYZ	15 320 T2 671 SMF	15 35 672 T2 1 JFK JFK		5   25 22 <u>T2 17</u> =K MIA	55 763 541 IAH	25 T2 1 LHR	
24A							25 73' T2 1163 SLC		-	25 T2 73: CLE	55 753 5 394 IAH							
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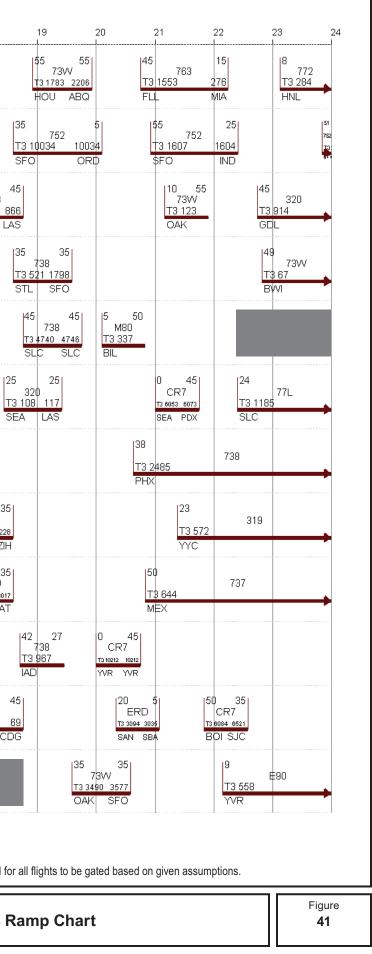
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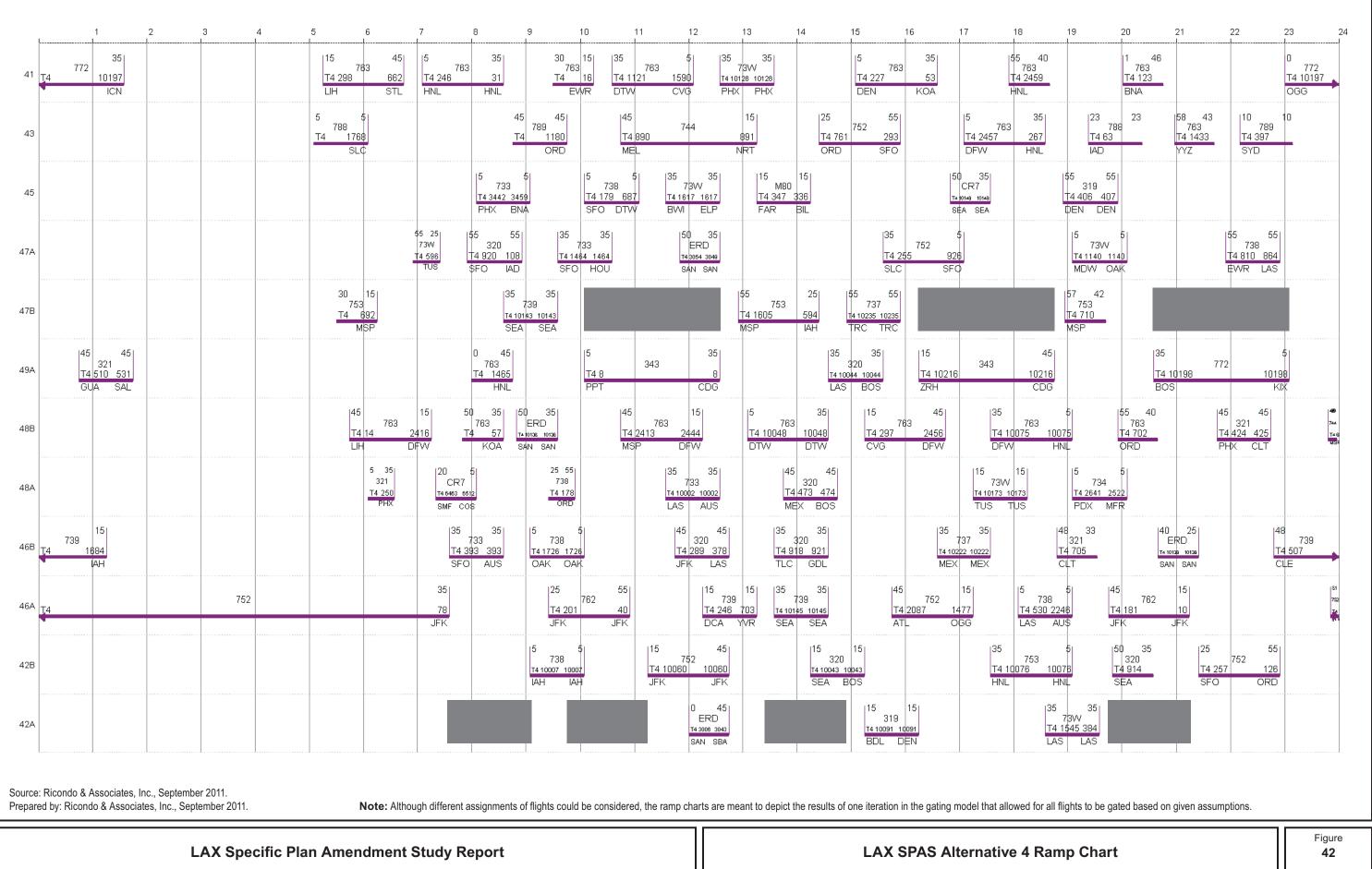


38         37         36         37<																					
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34     13     77L     45     13     13     13     13     13     10     13	35						M80 T3 34	б ТЗ	738 282 359	7 T3 100	3VV 45 10045	32 T3 797	1494				319 T3 10066 10	1066			
33B     13     738     13BB     13BB     13BB     13BB     173B     115     16     15     16	34	T3 45\$						CR7 T3 10147 10147	738 T3 10088 1008	88 T3	320 780 406	ТЗ 1	762 0054 1005	54 T3 101		10199	C T3 101	R9 17 10117	738 T3 10154 10154		
33A     T3     319     551     738     T3     738     738     738     738     738     738     738     738     738     738     738	33B T	Ţ3			738			18	368 тз	738 10097 10097	ТЗ	CR9 2415 2307	T3 100	738 023 10023	CR9 T3 2547 264			733 T3 3430 3430			
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31B     31B     131923 1954     131179 1182     133760 370       31A     31A     14     14     14     14     14     14     15     15     15     15     15     15     15     15     15     15     15     15     15     15     15     77W     13 1023     100 55     15     15     77W     13 72     173 10234     100 55     15     15     77W     13 72     173 10234     10234     10234     10 55     15     77W     13 72     13 72	32	Ţ3			737				18	738 T3 10106 10	106	15 73H <u>T3 244 56</u> JFK PD	7 T3 3076	3076	тз	321 10122 10122	T3 13	738 36 1716	T3 C	) 35 ERD 3092 3017 AN FAT	
31A 31A 251 310 310 31027 310027 310027 310027 310027 310027 310027 310027 310027 310027 310027 310027 310027 310027 310027 310027 310027 310027 310027 3100234 31023 3100 3100	31B												ТЗ	73VV 631 2977	T3 19	738 123 1954	73H T3 1179 1182		73VV T3 3760 37	760 -	
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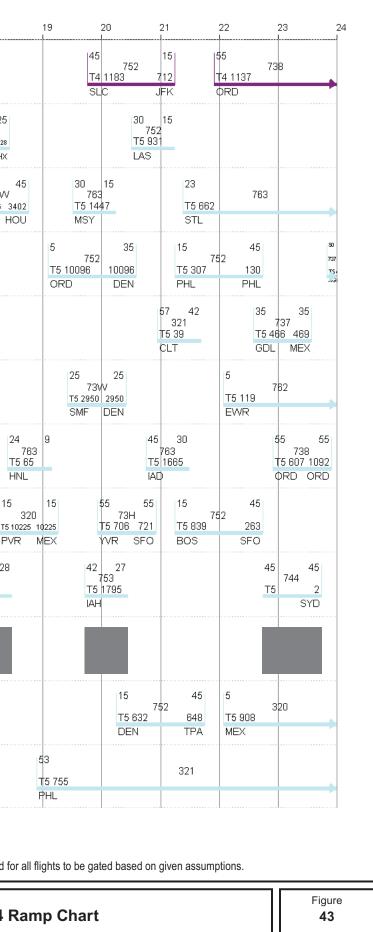




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<sup>40</sup> T4				738			35 423 LAS		752 10093 1009 N DEI	5 45 3 T4	752 10057 10		55 55 319 [4 6443 6442 DKC OKC	25 T4 10 SLC	55 752 165 10165 SLC		Т4	45 73VV 1446 1446 K SMF	
51A									55 55 73W T5 224 224 ØAK SFO	35 T5 2 JFK	752 Q81 E				752 345 1 D SF	5 70 0		C T5 647	25 R7 171 6528
51B 76: 15 6 M	691				35 T5 68 HNL	5 763 324 IAD			15 5 2422 T DFVV	0 35 763 5 1434 FLL	5 763 T5 842 ORD	35 840 ORD		5 76 T5 798 DFVV	35 3 768 STL	5 763 T5 5094 MCO	35 3 2094 ATL	T5 f	73VV 1796 341 4X HC
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53B						20 5 752 T5 508 SFO		5D 35 CR7 15/6435 6234 SAT DFW	23 752 T5 261 IAD		T5 2	35 73VV 17 349 MKE		15 319 T5 552 DEN	555		739 64 467	5 ( CR9 T5 10024 10024 MSY MS	
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57						5 5 788 T5 1212 ATL		15 T5 4 DFW	45 763 1 HNL	25 T5 170 IAH	772	55 1520 MIA				25 20 4 416 JFK			24 T5 HN
59								55 55 CR9 T5 4799 4793 PHX PHX	753 T5 159	4			752 1735 1	15 180 LC	T5 10	35 E90 12 10012 MCI	T5 10	35 320 150 10150	15 T5 10 PVR
58	45 T5	45 744 95 TPE				15 1 789 T5 45 M	15 56 IA	T5 :	35 73VV 3682 503 N SLC			55 T5 600 IAH	788	25 601 LIM		35 T5 2 EVV	763 70 29 र HN	5 28 78 7 T5 455 L SFO	28 39 5
56										0 45 752 T5 954 SFO					15 CR9 T5 2425 MFR	2444			
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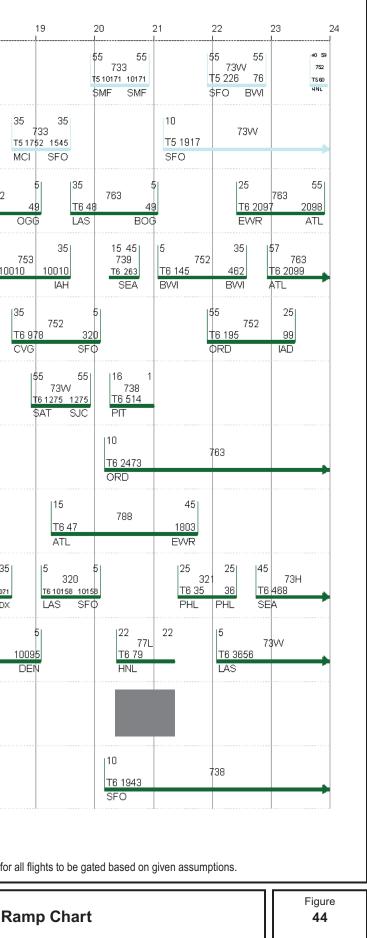
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52A								50 35 763 75 1703 EVVR		25	763 264 BOS			20 5 ERD 15 3070 3083 SBA SAN		15	45	
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65					15 752 T6 46 KOA	35 46 DEN	T6 3	35 73W 922 3922 D SMF	15 75 T6 163 BWI	45 2 89 OGG			5 752 <u>T6 2085</u> ATL	35 2092 ATL	25 733 16 10170 1 SMF 5	25 0170 SMF	5 73W <u>T6 1566</u> 134 SLC OA	5 11 .K
67A					5( TI	752		55 55 738 T6 628 629 DTW LAS	15 75 T6 272 BOS	45 2 856 IAD	44 	752 83	те	) 35 ERD 3181 3067 N SAN	45 T6 4 PHX	45 738 49 1563 SFO		
67B <u>T6</u>				763				281 Mi	T6 100:	35 38 51 10051 IAD			35 33 11 10011 MCI	35 7 T6 25 PDX	35 39 2 465 SEA		15 738 T6 737 SFO M	15 698 //SP
69A						15 76 <u>T6 286</u> KOA	35 3 202 MIA			0 45 763 T <u>6 3</u> HNL	15 ( 318 16 10026 10020 OMA OMA		5 ( 73W <u>T6 82 244</u> PHX BN/	5 5	T6 65	35 CR7 522 6491 L SMF		
69B T6		73H			( 56 PD)	5 1 K	15 CR9 <u>T6 2441</u> RNO F	2442		5 319 <u>T6 8594 859</u> YEG YEC	5 5 3	45 <u>т6 1</u> АТ	45 738 <u>0037 10037</u> _ ATL		15 1 E90 <u>T6 570 57</u> YYC YY	5 73 C	5 <u>די</u> א	0 35 CR7 6 5818 6071 1SY PDX
68A T6			73W			55 1288 MDVv	т6 10	319 1089 10089	55 55 733 T6 620 818 ELP SJC	1	55 55 738 16 10069 10069 LAS JAX		35 <u>T6 93</u> NRT	772 35	5 948 DEN	35 T6 1 ICN	772 0095	2
68B								10 55 CR7 16 2497 2330 SMF RDM	E T Y	5 55 E90 16 568 571 YC YYC		15 5 73VV <u>T6 3361 3361</u> TUS OAP	5					
66 <sub>T6</sub>				738				45 192 PHL		35 ( <u>16 26</u> PDX	35 R9 05 2601 LTO		45 16 1 OA	45 733 0160 10160 K SFO		42 Т6 ОА	27 738 798 K	

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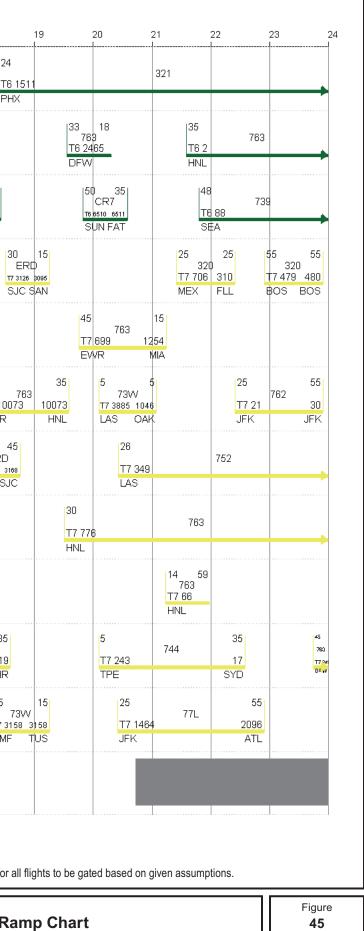
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64 16	321			35 1418 PHL			5 35 738 <u>T6 733</u> LAS	20 5 ERD 18 3173 312 SJC SJC	1	<u></u>	т6 1	45 738 1892 418 D PHX		L	
62 <u>T6</u>	763			68 DTV				15 76 <u>T6 2083</u> ATL	45 3 152 ATL	Ť	5 55 738 6 2196 144 DVV IAD	т	55 55 CR9 16 2837 2880 TO PHX		
60 <sub>T6</sub>		739				35 451 SEA		15 73VV 16 10164 10 SJC S	164		25 733 T6 1696 TUS	25 1696 SJC		125 73 T6 844 ELP	25 33 4 844 SMF
35 5 320 71A <u>T7 139</u> MEX					10 55 CR7 17 6523 6499 PHX SJC	25 25 319 T7 401 104 DEN DEN	50 35 CR7 17 10120 10120 TUS PHX	25 319 T7 924 SFO	929	5 5 319 77 10090 10090 YVR DEN	3: T7 1012	35 21 3 10123 PHX		35 321 947 10047 CLT	3( 17 S.
718					50 T	762	15 78 T7 417 CVG	45 3 2440 DFW		5 763 T7 271 MIA	35 252 MIA		45 738 223 223 RD PHX	8 53 762 T7 117 JFK	•
73			5 763 712 DGG	194 1	55 55 73VV 7 10013 10013 MDVV MDVV	45 763 T7 2407 DFW	1586 77 101	739 44 10144	0 45 CR7 1710077 10077 ABQ ABQ	25 T7 669 DTW	55 763 696 MSP	25 T7 203 HNL			5 T7 1007 EVVR
75A T7	752		15	i40	0 45 ERD 17 3014 3011 FAT FAT	15 4 752 T7 311 23 OGG SJI	7 320 7 T7 912 9		752 531 1		5 55 320 7 910 915 OS GDL	Т	1 36 752 7 1181 )EN		0 45 ERD 17 3022 3160 FAT SJC
75B T7		763				25 55 7 2428 T7 10059 DFVV MCO	52 10059 17	0 35 CR7 <sup>6315</sup> 6247 AN FAT			763 725 7: S BC		25 T7 10 IAD	55 763 9 HNL	
1 25 744 17 2 SYD					35 T7 49 ICN	772	3	0 45 CR7 17 6499 6065 SJC PDX	15 T7 12 ICN	744	45 11 NRT		30 7/ T7 1 TPE	30 44	
760 7800 0 <sup>-</sup> WY						35 5 20 73\ 2 929 T7 1954 MEX SMF		15 T7 10094 SYD	772	45 10094 DEN	15 321 T7 799 79 YYZ Y			5 763 T7 10219 LHR	35 3 10219 LHR
74					35 7 T7	35 72 81 HNL	25 T7 23 ATL	55 752 26 JFK		45 73W 872 1757 C DEN	20 5 CR7 17 6376 6477 TUS SMF		15 738 T7 177 6 MSP L	15 631 AS	15 7 17 315 SMF
728							50 35 ERD 17 3038 3079 SBA MRY		T7 220	35 MJ 2201 HMO		5 5 733 T7 73 73 MCI OAH			

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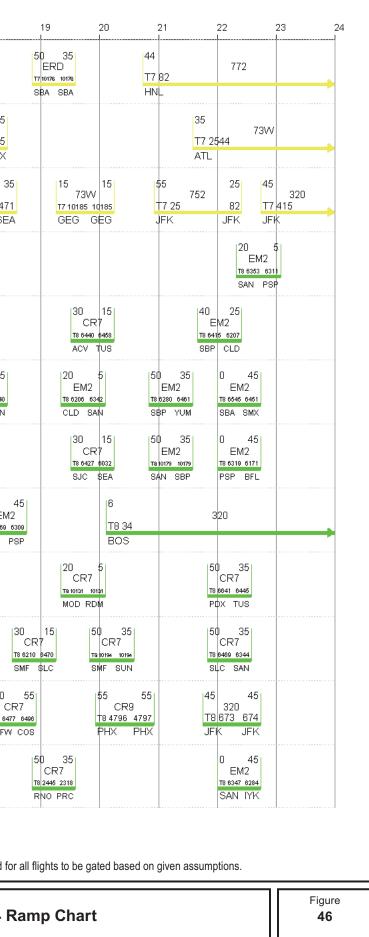
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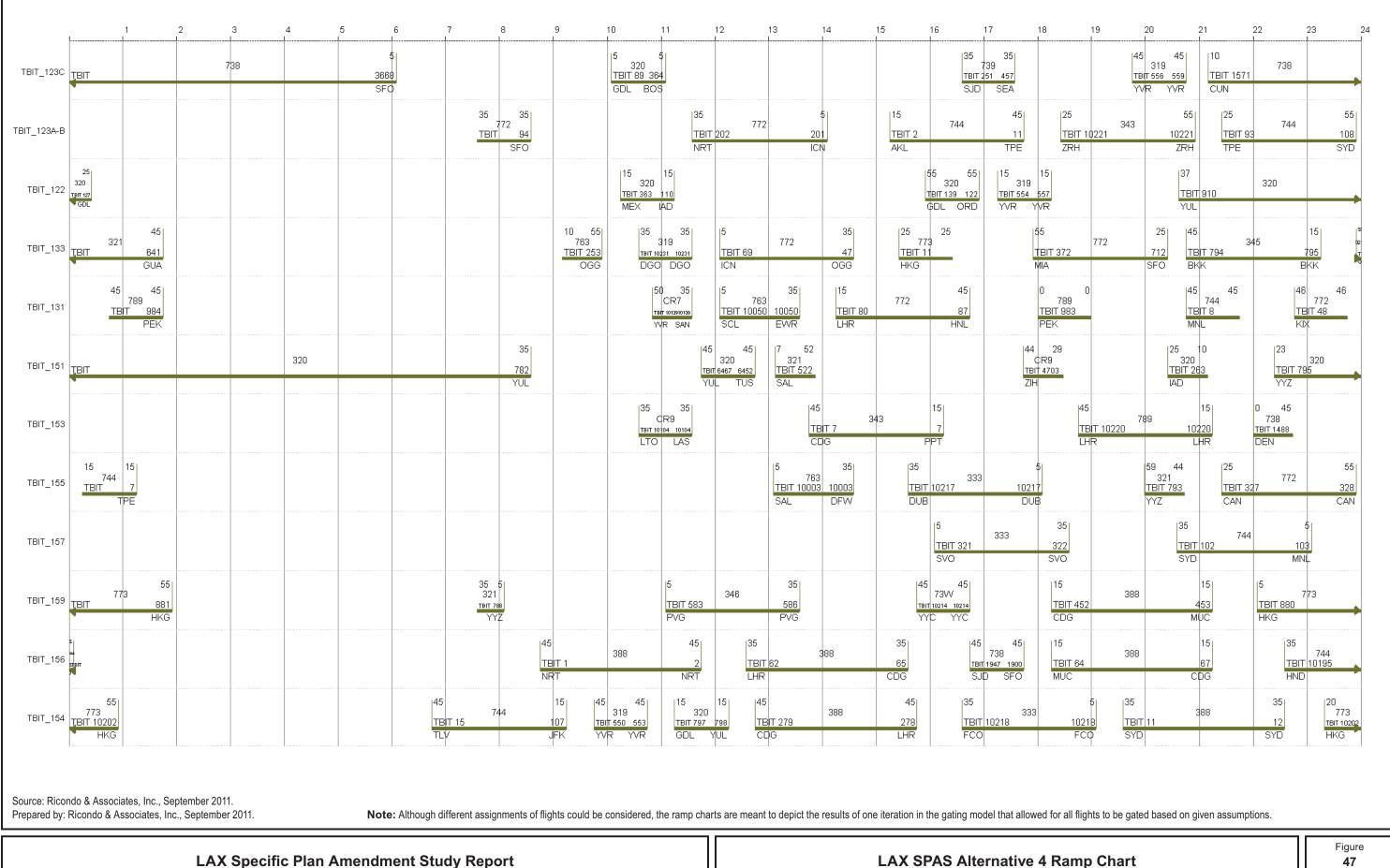


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72A T7			772				25 5	50 35 763 77 67	L					5	0 35 CR7 10130 10130 PD RDD		 39 772 344	_
<sup>708</sup> Ţ7			73VV			253 HOI				40 7 T7	25 752 878 SFO						25 73I T7 474 SEA	25 H 245 PDX
70A T7			320				35 404 JFK		739 T7 452 - 2	15 72 ZIH							T7 48	35 739 66 471 SEA
80								та	) 35 CR7 10129 10129 RC PRC	20 EM2 18 6279 644 IPL YUI	55	0 45 EM2 18 6202 6327 CLD SAN						
81						35 (102 (102 (102)	35 320 23 10223 MEX	20 ( EM2 18 6314 630 MRY PSF		Е т8 61	M2 52 6288 1	50 35 CR7 19 10187 10187 MOD MOD	15 45 320 T8 6219 DFW				5 CR9 18 10017 1001 MEM MEN	
82							30 EN 18 6299 OXR	12 6279	30 EM2 18 6368 6 SBA C	202			50 35 EM2 18 6282 6329 IYK SAN		20 EM2 18 6385 616 SBP BF	5 9 L	E T8 62	25 M2 91 6340 ( SAN
83							30 EN 13 6467 SMX	12 6322		15 E90 T8 450 MCI	15 350 MCI	T8 24	CR9 43 2316 T8	) 35 EM2 6326 6066 NT FAT	10 55 EM2 18 6329 6397 SAN SBP		10 55 EM2 18 6297 6206 OXR CLD	
<sup>84</sup> <u>T</u> 8			320			35 21 PHX	20 CR7 18 2467 24 STS S	474	15 5 320 T8 797 809 LAS CUN		55 55 CR9 T8 4793 4794 PHX PHX		45 45 733 78 2708 2708 SJC TUS		20 CR7 18 10119 101 PDX PD	р <u>т</u> а		0 45 EM2 18 6169 6309 BFL PSP
85							0 45 CR7 T8 6100 6061 SAN PDX	30 CR 18 6076 SUN `	6114	зт	0 35 CR7 86473 5818 BQ SEA		20 ( EM2 18 6455 642 YUM SGL	2 18 59	25 R7 95 6454 ASE		0 45 CR7 18 10182 10182 SJC SJC	
86					E T8 621	25 M2 11 6320 SAN	т	50 35 EM2 8 6239 6379 FAT SBP			20 CR7 1810088 10 CMH CM	2068			та	) 35 EM2 10191 10191 NT ONT		30 ( 178 62 SMF
87						15 45 320 T8 903 MEX		10 55 EM2 1910174 10174 BFL BFL	Т	5 55 319 8 403 400 DEN DEN	25 7: T8 34 AUS	25 33 1 994 PHX	55 55 319 T8 928 937 \$FO SFO	20 EM2 18 6163 633 BFL SA		25 31 T8 417 DEN	412	10 5 CR7 18 6477 64 DFW CC
88						та	0 35 CR7 6465 6466 LC SLC	0 45 CR7 19 10163 10163 SJC SMF	20 5 CR7 173 10092 1009 ASE ASE	2 18	0 35 CR7 96429 6138 SP TUL	0 45 CR7 18 6119 6522 TUS PHX		20 CR7 18 6229 643 DFW SA	31	0 45 CR7 Ta 10087 10087 COS COS		

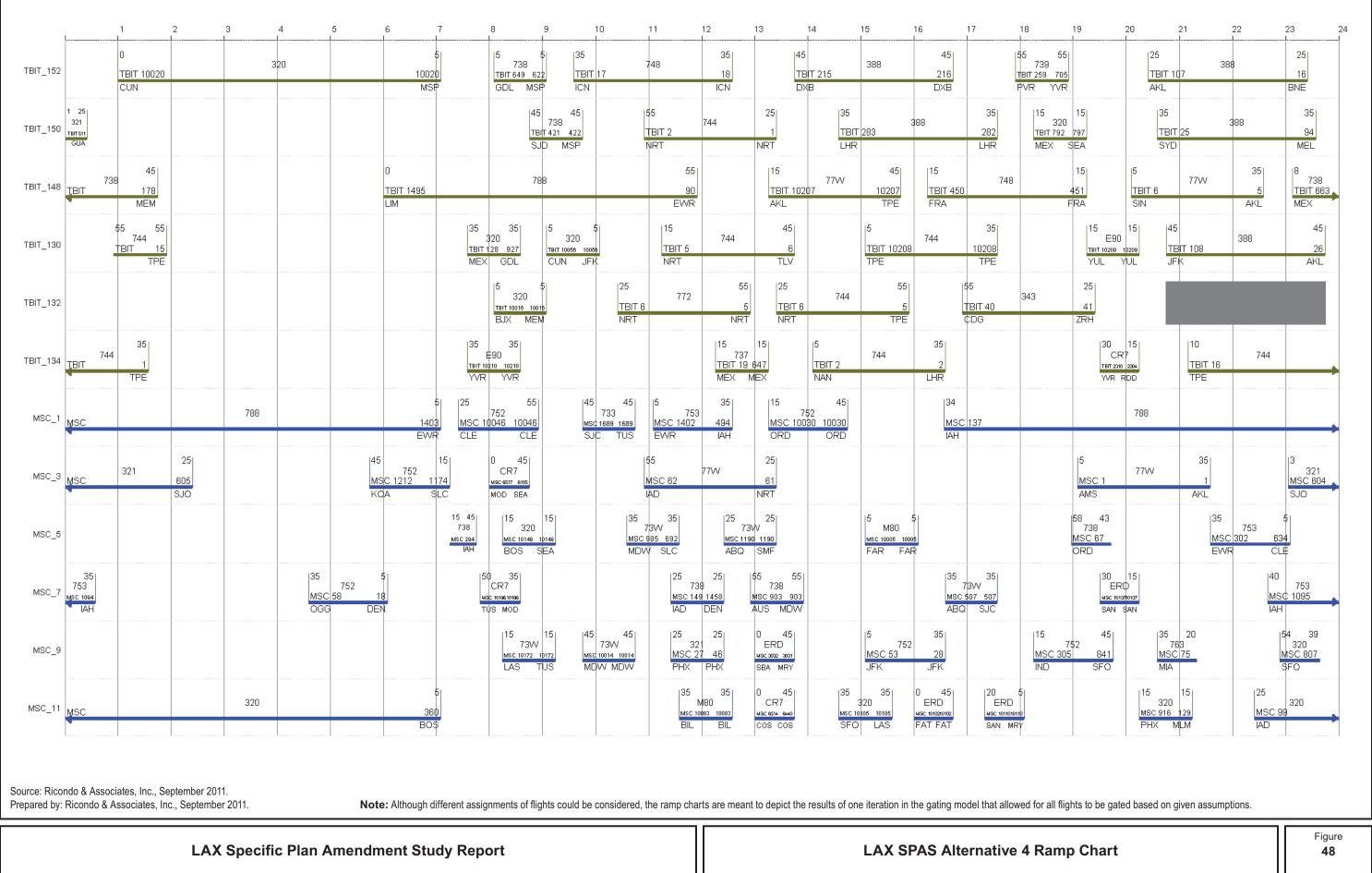
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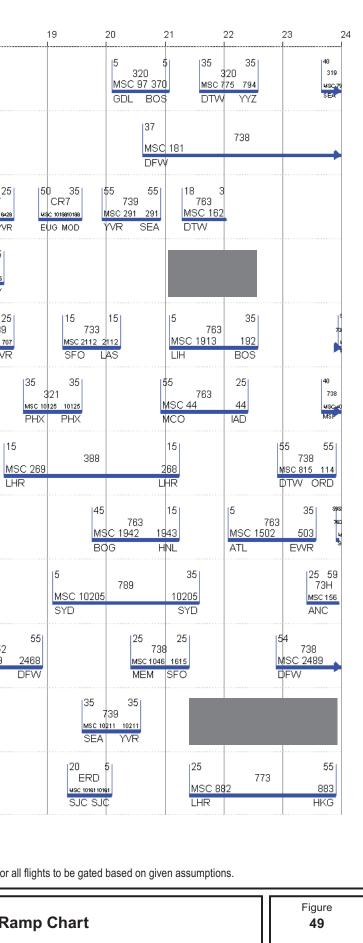
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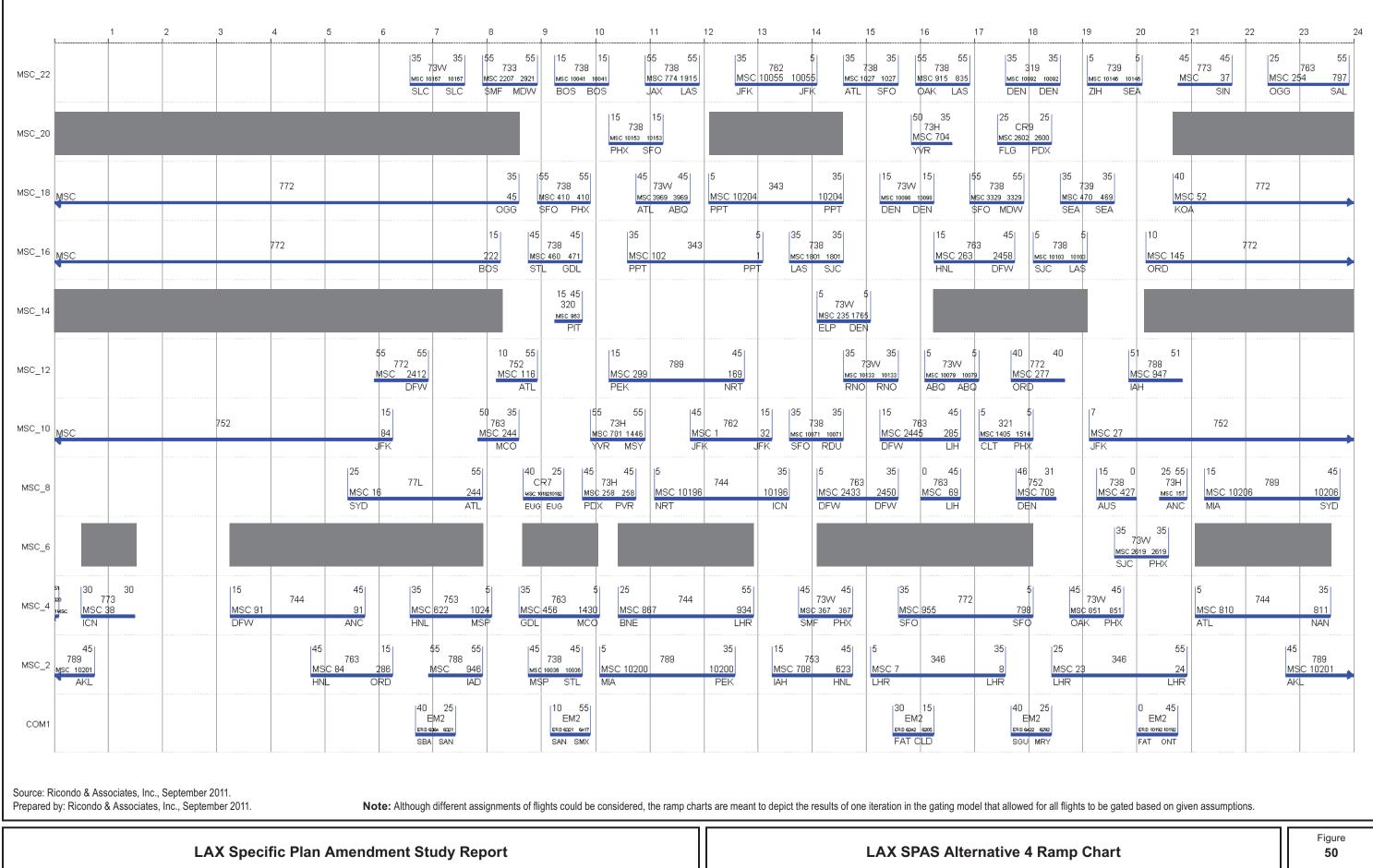


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MSC_13	MSC			:	319			92 SFC	5 5 0				25 32 MSC 1433 CLT	25 1 3 1496 CLT	5 738 MSC 1765 93 IAH OAI	17 M	0 35 CR7 £ 1022610236 HX TUL	20 ERI 450 3088 MRY	3090
MSC_15	MSC			738			176 MEN	6 мас	45 CR9 10116 10116 X PDX		10 55 CR7 wsccm cons PHX BOI		45 73VV 10040 10040 A BNA	5 320 MSC 912 9 GDL TL	17 ws	0 35 CR7 \$1009810098 OI BOI		15 RD 20 2000 SAN	
MSC_17								35 39 142 10142 SEA	5 5 738 MSC 5536 536 LAS DTW		0 45 763 MSC 2436 DFW	h	55 55 320 1SC 1595 694 AS IAH		20 CR7 سعت ۲۲۵۰۰۰۰۰۰۰۰۰۰۰۰۰۰۰۰۰۰۰۰۰۰۰۰۰۰۰۰۰۰۰۰۰۰۰	os wsce	25 R7 114 6519 SJC		0 25 CR7 sceas eas BQ YVR
MSC_19								20 ERD 4950000 300 SAN SB				5 ( 320 MSC 403 78 SFO SE/		35 320 407 412 JFK		15 CR9 MSC 4794 PHX F	1796	Mac -	15 CR7 1002510025 : MISY
MSC_21	MSC	738 3	5 03 TY					5 35 321 MSC 704 CLT		15 733 MSC 790 AUS S	15 45 790 мsc FO LAS	45 320 ¢ 202 202 \$ MSY	25 32 MSC 936 IAH		45 MS/ SF	45 733 2187 2187 O TUS	5 M80 MSC 10109 10 MFR MI		55 25 739 MSC 707 YVR
	25 738 ₩SC410 MSP							5 733 MSC 3811 60 SMF OAI		5 733 MSC 818 195 TUS ELF	5 4	1	55 55 739 MSC 5 6 SEA DCA		5 319 MSC 413 41 DEN DEI	5 4		₹7 14010140	
MSC_25	1 15 399 4152 ICN							5 35 738 4/SC 1920 SFO	15 5 320 MSC 101 102 LAS LAS		15 5 321 MSC 1431 790 CLT PHL	6 1	35 /ISC 456 FRA	388	55 457 FRA	25 32 MSC 2 PHX	9 500	10 5 CR7 450002 64 PDX TU	usa Mit
MSC_27							15	4 MSC 10	35 319 230 10230 CUL	MSC 9	320 900 5900 N	55 55 320 1SC 295 290 FK CUN	15 738 MSC 1919 ORD S	15 35 1919 мsc FO SJC	35 733 1640 2622 SMF	5 319 <u>MSC 10053</u> 1000 IAD IA[		55 5 CR9 MSC 2499 241 PHX BC	
MSC_29							35 7 MSC 10 PHX	35 3VV 126 10126 PHX	20 5 763 MSC 76 IAC		35 320 0156 10156 SFO	45 <u>MS</u> ( LA:	738 ¢630 180	5 738 MSC 10001 10 OAK AU	5 35 001 MSC JS SJC	35 738 1695 514 CLE			
MSC_28	MSC				738			6	15 398 RD	15 45 320 MSC 917 PVR	15 5 739 MSC 10008 1000 IAH IAH	8 MSC 24	55 763 17 2446 DFVV		55 55 738 MISC 10052 10052 IAD IAD			25 MSC JFK	752 1519
MSC_26	15 MSC 59 IAH	5		738			55 750 CLE	25 731 MSC 4515 SLC	4516	MSC :	35 739 720 453 SEA			10 55 ERD 452 3079 3001 MRY SAN		35 MSC LAS	87 384	5 320 MSC 795 1 IAH	5 542 IAH
MSC_24							5 35 73H MSC 477 SEA	5 73H MSC 150 14 ANC ANG	5 9 0	15 738 MSC 1173 1 SLC S	1176	15 78 MSC 658 HNL	45 33 688 DTVV	25 7: MSC 124 ORD	38 17 1624	25 73 MSC 33 SJD	8	55 5 320 MSC 902 90 \$EA ME	

Note: Although different assignments of flights could be considered, the ramp charts are meant to depict the results of one iteration in the gating model that allowed for all flights to be gated based on given assumptions.

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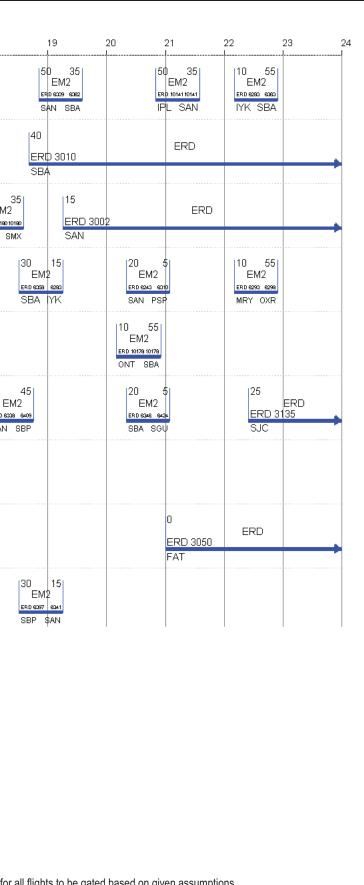


	1	2 3	4 5	6	7	8	9	10 11	12	13	14	15	16	17	18
СОМ2					30 Erd SG	15 EM2 8472 8246 U FAT		0 45 EM2 ERD 6222 6355 SAN SBA		50 35 EM2 ERD 2000 GALA CLD SMX					
сомз Ę	RD	ERD		15 3193 SJC		30 EN ERD 1011 PSP	110111	50 בפקס MRY	35 M2 294 8200 7 CLD			20 EM: 58A 5	10177		
сом4	RD	ERD		30	55 125 AN		0 45 EM2 ERD 2000 6020 CLD SAN		50 35 EM2 ERD 1019910199 ONT ONT		10 55 EM2 <u>ERD 6266 620</u> MRY CLE	L		5 E S	i0 3: EM2 Rp 101801018 IMX SM3
COM5								20 5 EM2 ERD 6296 6392 OXR IYK				M2 95 6305	50 35 ERD 589 3082 3007 SBA SBA		
СОМ6									0 EM2 ERD 6417 SMX 0	<u>)</u> 6295			20 EM2 ERD 820 83 CLD SE	5 38	
сом7	RD		EF	RD				15 3013 FAT	50 35 EM2 ERD قت20 قاتک SAN BFL	5		15 M2 27 6057 \$BA			0 EM ERD 6339 SAN S
сомв					ERD	15 EM2 <u>6480 6354</u> M \$BA						ERD 64	15 M2 SAN		
COM9	RD	ER	5		15 3131 SJC	10 55 EM2 <u>ERD 6220</u> 6296 SAN OXR			ERC	) 5 EM2 96225 6002 N PSP	0 45 EM2 ERD 6241 6291 FAT MRY			20 EM2 ERD 6475 6 YUM IF	
OM10					40 25 EM2 ERD 6312 6200 PSP CLD						50 35 EM2 ERD 10190 10190 SÁN ONT				

Note: Although different assignments of flights could be considered, the ramp charts are meant to depict the results of one iteration in the gating model that allowed for all flights to be gated based on given assumptions.

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LAX SPAS Alternative 4



Ramp Chart	
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