CHAPTER THREE
PURPOSE AND NEED

3.0 INTRODUCTION

FAA Order 1050.1E, Change 1, *Environmental Impacts: Policies and Procedures*, dated March 20, 2006*;* Paragraph 506d.*, Purpose and Need,* states that this section of the Draft EIS "briefly specifies the underlying purpose and need for the Federal action. It presents the problem being addressed, how the alternatives would resolve the problem, and the benefits of the Federal action. It distinguishes between the need for the proposed action and the desires or preferences of the agency or applicant, and essentially provides the parameters for defining a reasonable range of alternatives to be considered."

Accordingly, the Agency (for this Draft Environmental Impact Statement (EIS), the Agency is the FAA) must first see what, if any, conditions need attention at a particular airport. In this case, the Agency reviewed the Airport Sponsor's goals and objectives (see next section) and identified a pressing airfield condition: the existing airfield at Fort Lauderdale-Hollywood International Airport (FLL) lacks sufficient capacity to accommodate existing and forecast air carrier demand at an acceptable level of delay. The Agency next recognized that airfield improvements, including those proposed by the Airport Sponsor, could change those conditions by:

- **Providing sufficient airfield capacity to the extent practicable, to accommodate existing and forecast air carrier demand at an acceptable level of delay;**
- **Facilitating balanced use of the airfield, distributing departing and arriving aircraft within the runway system in the most efficient way; and**
- **Adding terminal gate capacity to stop congestion on the ramp.**

Finally, the Agency reviewed the purpose that Federally-funded airport projects must fulfill: to enhance the safety, efficiency, and capacity of airports and airspace within the region and the National Airspace System.

3.1 SPONSOR'S IDENTIFIED GOALS AND OBJECTIVES

On October 26, 2004, the Broward County Commission adopted the following *County's Airfield Development Program Objective Statement* for the FAA's consideration in developing its Federal purpose and need:

> **"The purpose of the proposed airfield improvements is to simultaneously achieve the following to the maximum extent practical":**
>
> - **enhance FLL's capacity to accommodate forecast traffic through the year 2020 in a manner that will maintain annual average aircraft delay at or below the 6 to 10 minute annual average delay range,**
> - **decommission the use of Runway 13/31 (crosswind); and,**

- **in the interim, avoid using Runway 13/31 to address forecast increases in aircraft delays given Runway 13/31's operational inefficiencies and the higher levels of residential noise exposure associated with its use,**
- **mitigate noise exposure attributable to proposed improvements by implementing a runway use plan and residential noise mitigation processes contained in approved Interlocal agreements and development orders with and from nearby cities in an environmentally sensitive manner while preserving the airport's vital economic role, and**
- **implement residential noise mitigation initiatives in areas not currently eligible under the Airport Improvement Program to deal with the overall forecast growth in aircraft operations, including implementing mitigation in advance of the onset of noise exposure in residential areas forecast to be newly exposed to the highest levels of cumulative aircraft noise resulting from changes in the configuration of the airport, while preserving neighborhoods and providing affordable housing."**

The FAA is responsible for preparing the EIS for the Airport Sponsor's Proposed Project and alternatives and, as the lead Federal agency, published a Notice of Intent in January 2005, informing the public that FAA will prepare the EIS and begin the National Environmental Policy Act (NEPA) process.

3.2 PROBLEM STATEMENT

The FAA determined that the ability of FLL to accommodate future air transportation demand is limited by the following:

- **Insufficient airfield capacity to accommodate projected aviation demand with an acceptable level of average aircraft delay;**
- **Inadequate runway length, width, and taxiway infrastructure to accommodate larger aircraft and balanced airfield use; and**
- **Insufficient gate capacity and terminal facilities.**

3.2.1 INSUFFICIENT AIRFIELD CAPACITY TO ACCOMMODATE PROJECTED AVIATION DEMAND WITH AN ACCEPTABLE LEVEL OF AIRCRAFT DELAY

There is now insufficient capacity at FLL. The forecasts provided by the 2006 FAA Terminal Area Forecast (TAF) show that the existing shortage of capacity at FLL will become exacerbated in the future.

The increase in aircraft operations forecast to occur by 2012 and 2020, as presented in the 2006 FAA TAF,[1] contributes to the need for an operationally flexible runway system that can accommodate projected numbers of operations and sizes of aircraft at FLL. Currently, only Runway 9L/27R, the primary air carrier runway, can accommodate the large air carrier aircraft (e.g., Airbus 320, Boeing 767) operating at FLL without restrictions. The existing parallel runway,

[1] ***FAA 2006* Terminal *Area Forecast*, published in January 2007.**

Runway 9R/27L, can accommodate only limited commuter and general aviation aircraft due to insufficient runway length, width, and adequate separation from its taxiway.

FAA air traffic control (ATC) uses Runway 13/31 to address existing capacity issues at FLL when Runway 9L/27R cannot handle demand during some peak periods. Although Runway 13/31 provides sufficient length and width to accommodate a portion of the aviation fleet, its use is severely limited because of its crosswind orientation and intersection with the other runways.

These conditions create a deficiency in capacity. This deficiency will increase because the number of large air carrier aircraft operating at FLL is forecast to increase through 2012 and 2020.[2] The primary runway, Runway 9L/27R, can accommodate all of the aircraft types currently operating at FLL, as well as the 2012 and 2020 projected fleet mixes, at its existing length and width. However, only Runway 9L/27R is able to accommodate all of the larger aircraft.

3.2.2 INADEQUATE RUNWAY LENGTH, WIDTH, AND TAXIWAY INFRASTRUCTURE TO ACCOMMODATE LARGER AIRCRAFT AND BALANCED AIRFIELD USE

The three existing runways at FLL are of different lengths. Runway 9L/27R, the primary and longest runway at 9,000 feet long and 150 feet wide, can accommodate the current and forecast aircraft types. By comparison, Runway 9R/27L has an overall length of 5,276 feet and width of 100 feet and can only accommodate a very limited portion of the current and forecast aircraft types. The inadequate length and width of Runway 9R/27L within the current airfield configuration does not provide for the balanced use of the runways, because it does not allow for simultaneous air carrier operations.[3] In addition to the limited length of Runway 9R/27L, the runway width of 100 feet restricts its use to aircraft with a wingspan up to, but not including 118 feet.[4] This precludes some types of air carrier aircraft from operating on Runway 9R/27L.

The design of the taxiway system that serves existing Runway 9R/27L further restricts the use of the runway. Runway 9R/27L has one parallel taxiway on each side of the runway, set at a 250-foot lateral separation from the runway centerline. This runway-to-taxiway separation is sufficient to accommodate Airplane Design Group (ADG) II (e.g., a Beech 1900 and the vast majority of general aviation aircraft) during visual approach conditions (i.e., VFR-visual flight rules). But, the lateral separation and width of the taxiways severely restrict the use of the taxiway

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[2] The FAA uses 2012 and 2020 as a basis for analysis because 2012 is the projected earliest implementation year of the Airport Sponsor's Proposed Project and 2020, because it represents a future condition after full implementation of the Airport Sponsor's Proposed Project.

[3] Simultaneous operation is an FAA Air Traffic Control term that refers to the ability to land/depart two aircraft at the same time on more than one runway.

[4] FAA Advisory Circular 150/5300-13. *Airport Design*, *Airplane Design Group*.

system and the capacity of the runway if used by aircraft such as the Boeing 737 or Airbus 320. To accommodate the larger current and forecast air carrier fleet mix (i.e., ADG-IV), FAA recommends a runway-to-taxiway separation of 400 feet.[5]

Runway 13/31 can only accommodate a portion of the current and forecast aircraft types at its current length and width. Because it physically intersects with Runway 9L/27R and 9R/27L, its use precludes simultaneous operation of those runways.

3.2.3 INSUFFICIENT GATE CAPACITY AND TERMINAL FACILITIES

Currently, FLL has 57 aircraft gates. Broward County has submitted a Draft Environmental Assessment (EA) for additional gates to FAA for consideration. Chapter Seven, *Cumulative Impacts,* discusses this EA. For purposes of this Draft EIS the FAA assessed the terminal gates required to meet forecast demand at FLL. The FAA's analysis, provided in Appendix D.2, *Terminal Gate Verification,* assessed two things – an estimation of the number of gates required, and the wingspan frontage needed to accommodate the estimated gates. Using the number of gates and frontage requirements, the FAA determined the ability of the terminal area to expand to meet future aircraft demand. *See* Section 3.3.3 for further discussion of projected gate capacity issues at FLL.

3.3 NEED FOR THE PROJECT

The FAA considered the deficiencies present at FLL and their impact on the FAA's purpose of enhancing safety, efficiency, and capacity on both the regional and national level, and has identified the following needs at FLL:

- **The need for sufficient airfield capacity to the extent practicable, to accommodate existing and projected air carrier demand at an acceptable level of delay;**
- **The need for an enhanced and balanced airfield; and**
- **The need for adequate terminal gate facilities.**

In order for an alternative to be considered viable and carried forward for detailed evaluation within the NEPA process and this Draft EIS, it must address one or more of these needs, as described more fully in the following sections.

3.3.1 NEED FOR SUFFICIENT AIRFIELD CAPACITY

Provide sufficient airfield capacity, to the extent practicable, to accommodate existing and projected air carrier demand at an acceptable level of average delay:

Three factors must be analyzed when considering the adequacy of airfield capacity. They include the projected operational demand including peak periods of the airport as established in aviation forecasts, the existing airfield capacity, and the level of delay for operations in the future, given the forecast growth of operations. The

[5] **FAA Advisory Circular 150/5300-13. *Airport Design*, *Airplane Design Group*.**

projected operational demand for this Draft EIS is based on the FAA's 2006 TAF. The existing airfield capacity was calculated to determine the number of operations the airfield can accommodate during a specific time period. The analyses of these factors indicate the existing airfield capacity is inadequate to meet the projected demand at an acceptable level of aircraft delay.

3.3.1.1 Projected Operational Demand

FAA develops TAFs that project the annual enplanements and aircraft operations for individual airports in the U. S. As part of FAA's annual forecast update as documented in the *Aerospace Forecasts Fiscal Years 2006-2017,*[6] the FAA provides the measure of the accuracy of FAA projections of aviation demand and workloads at FAA facilities for forecasts published one and ten years prior to the forecast.

An aircraft operation is defined as one takeoff or one landing. Enplanements are the total number of passengers departing from a particular airport. Annual enplanements are the sum of originating and connecting passengers for air carrier and commuter airlines during a one-year period. Both enplanements and aircraft operations are provided in the TAF to give the best and most accurate forecast based on historical trends and future socioeconomic and aviation trends. The TAF is used to plan the staff and equipment needs at air traffic control towers (ATCT) and serves as the foundation for many airport capacity improvements.

The 2006 TAF provides projections of aviation activity through Federal Fiscal Year (FFY) 2025. The FAA TAF for FLL is shown in Table 3-1, *2004 Terminal Area Forecast,* and graphically depicted on Exhibit 3-1, *2004 Terminal Area Forecast*. Total annual operations at FLL (i.e., the total number of air carrier and air taxi/commuter aircraft take-offs and landings in one year) are forecast to increase from 300,479 in 2006 to 341,877 in 2012 and 408,536 in 2020. Thus, annual aircraft operations are projected to increase by 2.2 percent annually from 2006 to 2012 and by 2.3 percent annually from 2012 to 2020.

Air carrier operations are forecast to increase 2.6 percent per year from 2006 to 2020. General aviation activity, the primary user of Runway 9R/27L, is forecast to increase from 56,686 operations in 2006 to 63,800 in 2012, and to 74,701 in 2020.

In developing the TAF for FLL, the FAA considered historical activity levels, growth rates and activity patterns, forecast of personal income for the FLL market area, and local and national aviation industry trends, particularly those related to airline yields.[7]

For further discussion of the TAF, *See Aviation Activity Forecasts and Derivative Design Day Forecasts,*[8] provided in Appendix D.1, *Forecast Verification and Derivatives*.

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[6] **FAA. *Aerospace Forecasts Fiscal Years 2006-2017,* Appendix Forecast Accuracy.**

[7] **Airline Yields are a largely a function of distance flown, passenger, cargo, or mail ratios, and premium or economy class passengers.**

[8] ***Verification of Aviation Activity Forecasts and Development of Derivative Average Annual Day Forecasts*, Landrum & Brown, September 2005.**

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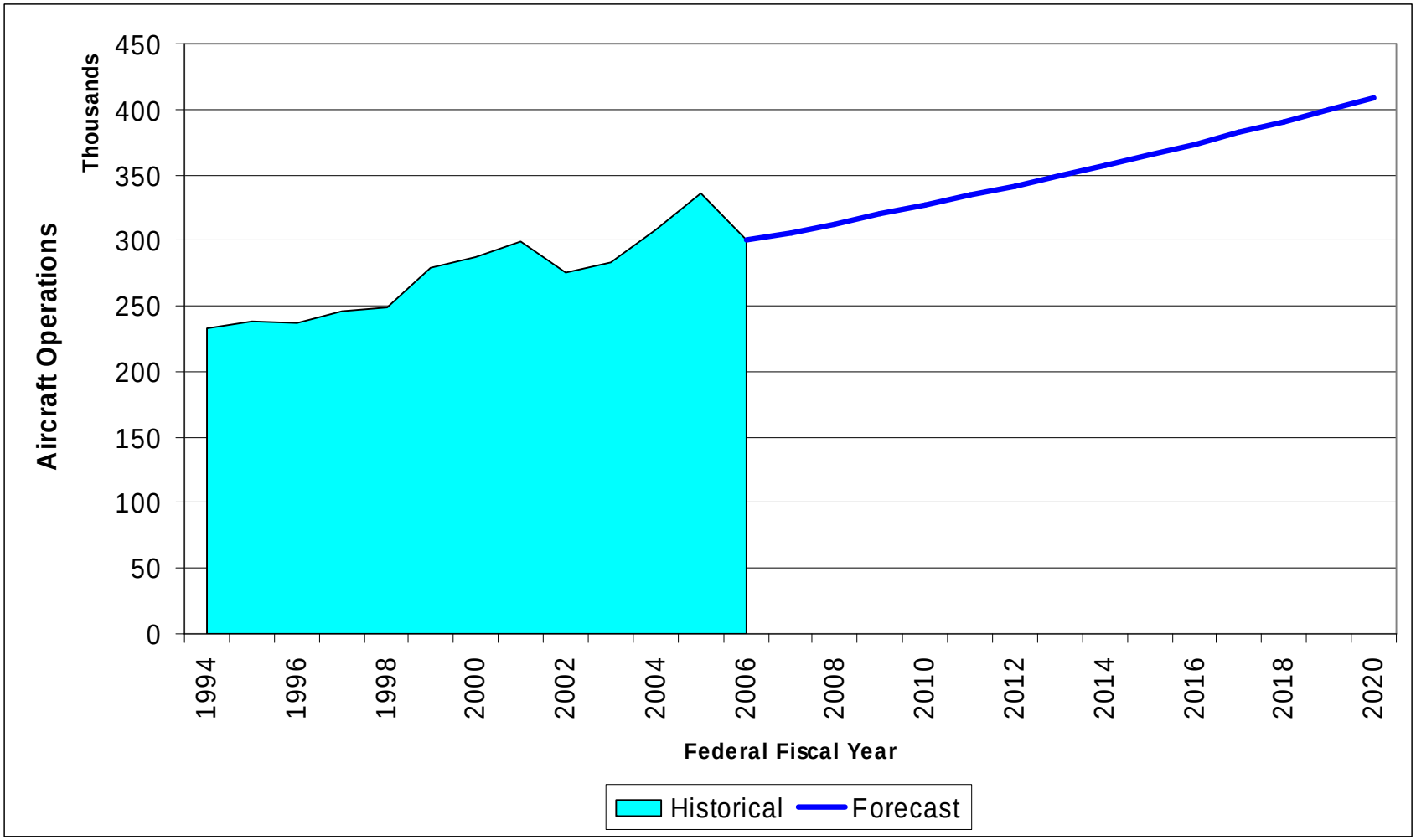
Table 3-1
FAA 2006 TERMINAL AREA FORECAST
Fort Lauderdale-Hollywood International Airport

	Enplanements			Operations				
					Commuter &	General		
FFY	Air Carrier	Commuter	Total	Air Carrier	Air Taxi	Aviation	Military	Total
2000	7,288,034	365,665	7,653,699	143,950	54,560	87,787	797	287,094
2001	8,071,530	331,186	8,402,716	158,528	58,050	82,594	601	299,773
2002	7,572,587	313,391	7,885,978	147,874	64,076	62,958	565	275,473
2003	8,073,136	334,777	8,407,913	153,827	67,994	61,074	591	283,486
2004	9,254,940	478,231	9,733,171	168,884	68,002	70,825	632	308,343
2005	10,296,137	665,758	10,961,895	183,252	80,552	71,955	352	336,111
2006 [1/]	9,749,292	594,517	10,343,809	178,916	64,507	56,686	370	300,479
2012	11,602,758	647,790	12,250,548	209,315	68,392	63,800	370	341,877
2020	14,553,267	859,631	15,412,898	257,027	76,438	74,701	370	408,536
Average Annual Growth Rates								
00-06	5.0%	8.4%	5.1%	3.7%	2.8%	-7.0%	-12.0%	0.8%
06-12	2.9%	1.4%	2.9%	2.6%	1.0%	2.0%	0.0%	2.2%
12-20	2.9%	3.6%	2.9%	2.6%	1.4%	2.0%	0.0%	2.3%
06-20	2.9%	2.7%	2.9%	2.6%	1.2%	2.0%	0.0%	2.2%

1/ FFY 2006 totals are estimated.

Source: FAA 2006 Terminal Area Forecast, which is published in January 2007.

Exhibit 3-1
FAA 2006 TERMINAL AREA FORECAST-AIRCRAFT OPERATIONS
Fort Lauderdale-Hollywood International Airport



Source: Landrum & Brown, 2007.

3.3.1.2 Existing Airfield Capacity

Airfield capacity is defined as the total number of operations that the airfield can accommodate at an acceptable level of delay. Wind and weather conditions directly affect the use of an airport's runway system and ATC procedures, and determine the procedures used on a given day or at a given time. The direction and speed of the wind affect the direction in which an airport operates the runways. Because of wind and weather conditions and the existing airfield configuration at FLL (the parallel Runways 9L/27R and 9R/27L, and the crosswind runway, Runway 13/31), FLL operates to the east (east flow) approximately 80 percent of the time, and to the west (west flow) approximately 20 percent. Under an east flow pattern, for example, aircraft would arrive from the west, landing on Runway 9L/27R and then depart to the east on the same runway.

Appendix F, *Net Benefits Analysis,* describes the methodology the FAA used to determine the FLL airfield capacity. This methodology consists of the following steps:

- **Determine how ATC staff at FLL use the existing airfield runways to accommodate demand. Runway use assumptions were developed from discussions with FAA ATC staff for east flow and west flow during VFR[9] and Instrument Flight Rules (IFR) based on existing ATC operating procedures and other operating assumptions/characteristics associated with unrestricted use of the existing airfield. The capacity analysis assumes the use of the parallel Runways 9L/27R and 9R/27L for departures as well as arrivals (referred to as mixed operations). The analysis considers the occasional use of Runway 13/31. Runway 13/31 is used infrequently because it intersects with the parallel runways and thus interferes with operations on these two runways. Finally, the capacity analysis limits the use of Runway 9R/27L to mostly general aviation propeller aircraft, as described in detail in 3.C.2, *Need for an Enhanced and Balanced Airfield*. The analysis includes a limited number of general aviation jet aircraft using Runway 9R/27L in response to rising delays at FLL.**
- **Calculate the hourly capacity of the existing airfield using the FAA Advisory Circular 150/5060, *Airport Capacity and Delay.* The Advisory Circular provides guidance on how to compute capacity based on the number of runways and their layout (i.e. parallel/intersecting/converging runways), the percentage of arrivals and departures during a given period of time, and the separation required between aircraft, which varies depending on the aircraft fleet. This guidance describes how to calculate capacity for VFR and IFR conditions. The Advisory Circular guidance does not take into account operational restrictions due to specific runway length or unique ATC procedures at FLL, such as how arrivals and departures are allocated between the runways. These specific considerations are described in Appendix F, *Net Benefits Analysis*.**

[9] **Optimized airfield conditions at FLL would be under Visual Flight Rule (VFR) conditions, which are when weather conditions are such that aircraft can maintain safe operations by visual means, and thus maintain closer in-trail separation distances which would increase the number of aircraft that could arrive to the airfield.**

- **Conduct a demand/capacity analysis using a queuing model, where the demand for the runways is modeled against the capacity of the runways to derive peak hour throughput[10] and average delay. Throughput that results from this analysis is a measure of the hourly capacity of FLL airport.**

When strictly based on the FAA Advisory Circular 150/5060, *Airport Capacity and Delay*, the FLL airfield yields a theoretical capacity of 113 mixed operations per hour. However, strict adherence to the Advisory Circular does not reflect actual conditions or demand at FLL. Taking actual conditions and forecast demand into account, the throughput of the airfield is 84 operations per hour, because there is insufficient general aviation demand to maximize use of Runway 9R/27L.

3.3.1.3 Level of Delay

The concentration of traffic at an airport can result in congestion and delay. Airport planners and designers use the average delay per aircraft operation as a measure of congestion, which results when aircraft operations demand exceeds airfield capacity.

As stated in the FAA's National Plan of Integrated Airport Systems (NPIAS) for larger airports, the onset of a more rapid growth in delay often occurs when average delay is between four and six minutes per aircraft operation.[11] FAA experience shows that airfield delay increases gradually with rising levels of traffic until a certain level is reached. Thereafter, the delay rises more rapidly with increased traffic, while capacity increases only marginally. This delay threshold is typically around six minutes of average delay per operation. This means that during peak periods and less favorable weather conditions, some flights may be delayed as much as 30 to 60 minutes. Operating above this threshold is undesirable for passengers as well as the airlines. It often results in unreliable service, missed connections, lost baggage, flight cancellations, increased fuel costs and increased airline crew costs. Because capacity is a function of delay, many airports plan new runways or runway improvements when approaching six minutes of delay. There are isolated cases in the U.S. where, due to highly constrained situations, airports operate or plan to operate at delay above six minutes. The delay threshold used in this EIS for establishing the capacity of FLL is six minutes per operation. The capacity of the existing airport is calculated to be 310,000 annual operations at six minutes of annual average delay per operation.

Some incidents of delay are directly attributed to wind and weather at FLL, while others are related to conditions that occur throughout the National Airspace System. Wind and weather conditions directly affect the use of an airport's runway system and ATC procedures, and determine the procedures used on a given day or at a given time. The direction and speed of the wind affect the direction in which

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[10] **Hourly runway throughput means the maximum number of aircraft that can land and depart at an airport or runway system during a period of one hour.**

[11] **Department of Transportation. FAA. *National Plan of Integrated Airport Systems (NPIAS) (2007-2011)*. Report of the Secretary of Transportation to the United States Congress Pursuant to Section 47103 of Title 49, United States Code. September 29, 2006.**

an airport operates the runways and affect the airport's ability to operate at its maximum capacity configurations. Changes in the hourly distribution of aircraft activity, fleet mix changes, and frequency of service on busy routes also combine to impact delays at FLL.

The replacement of turboprop aircraft with regional jet aircraft (regional jet) can result in additional delays. Regional jets use the same flight tracks as air carrier jets, which require that they be sequenced in-trail[12] with other air carrier aircraft. Turboprops, on the other hand, can be separated from the jets in the airspace by using different flight tracks and airspace altitudes. Regional jets require greater runway length for take-offs and landings than turboprops. Therefore, regional jets occupy the same runways as the air carrier jets and occupy them longer than turboprops.

Existing delays at FLL were calculated using the FAA's database of Aviation System Performance Metrics (ASPM), which is the best source of delay data available, and the most widely used industry reference for actual airport delay statistics. ASPM data does not include performance for general aviation and small air taxi airlines. At FLL, ATC typically assigns these flights to the shorter parallel runway, Runway 9R/27L. Therefore, ASPM delays at FLL reflect the performance of the scheduled carriers, which make up most of the operations at the airport and use the longer runways 9L/27R and 13/31.

Average delay at FLL was calculated for each month in the years 2004 and 2005, as graphically depicted in Exhibit 3-2, *Average Delay by Month*. This calculation includes only delays reasonably attributable to the airport/runway system at FLL. Average delay at FLL, as reported by ASPM, increased from 6.48 minutes per operation in 2004 to 7.25 minutes per operation in 2005. Delay varied by month, ranging from a low of 3.5 minutes in September of 2005 up to 11.8 minutes per operation during the peak month of March 2005. In 2005, September and October were the only months when delay did not approach or exceed six minutes per operation.

[12] **In-trail is defined as the separation of aircraft to avoid aircraft wake turbulence. In-trail separation standards apply when one aircraft is behind another aircraft, and the trailing aircraft must maintain a safe separation from the hazardous wake vortices produced by the leading aircraft. Wake vortices are the result of the airflow around and about the aircraft wing during flight; and rotate rapidly and increase in intensity with heavier aircraft. The vortices from heavier aircraft can be hazardous to smaller aircraft.**

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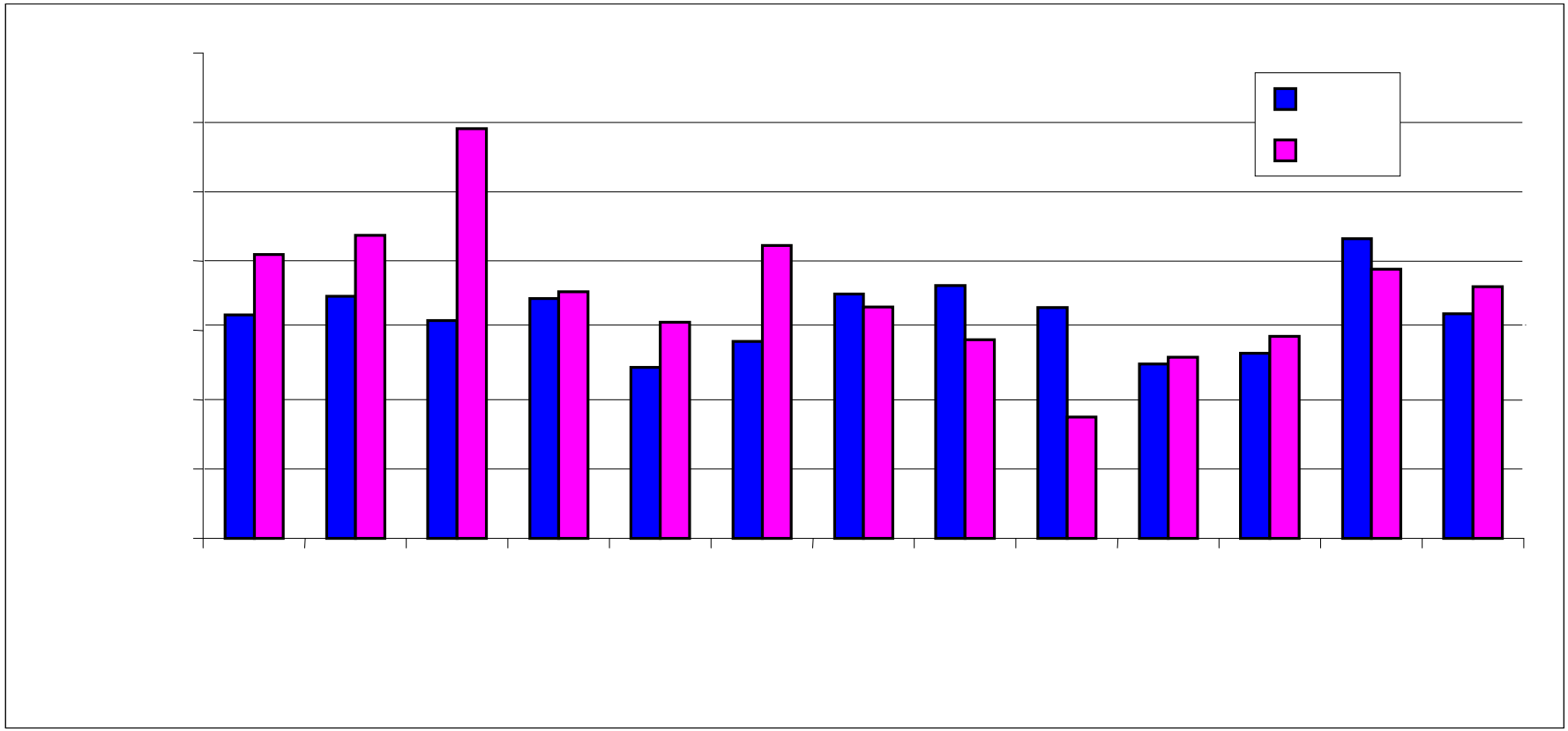
Exhibit 3-2
AVERAGE DELAY BY MONTH
Fort Lauderdale-Hollywood International Airport



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The queue model used to calculate delay in the EIS was calibrated against actual ASPM delay data to ensure that the model produced accurate measures of delay for the EIS analysis of future demand and alternatives. Average delay generated by the queue model for the base year of 2004 for the Peak Month Average Day demand level is 4.1 minutes per operation for all airport operations, including air carrier, commuter, air taxi, and general aviation. The queue model shows that, with increased demand in future years 2012 and 2020, average delays at FLL are estimated to increase to approximately 26 minutes per operation. In order to maintain average delays at the acceptable six minutes per operation threshold, there is a need to provide airfield capacity of between 101 and 107 operations per hour. *See* Appendix F, *Net Benefits Analysis,* for a description of the delay analysis.

3.3.2 NEED FOR AN ENHANCED AND BALANCED AIRFIELD

Provide an enhanced and balanced airfield system capable of accommodating the current and projected air carrier fleet mix:

A balanced airfield maximizes the efficiency of airport operations. A major question in airport planning is whether runways are adequate to handle the anticipated aircraft operations. To analyze airfield efficiency, two key factors are considered: (a) the existing runway operational capabilities, and (b) the runway length.

3.3.2.1 Existing Runway Operational Capabilities

The current configuration of the FLL airfield results in assignment of a large majority of aircraft operations onto Runway 9L/27R, due to its length and width. At some airports, reliance on a single runway can be reasonable, if aircraft delay is not excessive and the single runway remains open and able to accommodate the existing and forecast fleet mix. At FLL, Runway 9L/27R alone is not able to accommodate the existing or forecast demand. By 2010, FLL is projected to experience unacceptable operational delays, above 10 minutes of annual average delay per aircraft operation, which adversely affects operations at the airport and within the National Airspace System.

The current airfield configuration also affects runway availability. Runway availability can be interrupted by a variety of incidents including: routine pavement repairs, runway re-marking, periodic pavement reconstruction, or aircraft emergencies or accidents. The impact associated with such events can last for short periods or for several days depending upon the extent of the action. Temporary closure of a runway can significantly disrupt operations, cause considerable inconvenience to passengers, and impose extensive costs on airport users. Lack of a second runway capable of accommodating larger air carrier aircraft leaves FLL vulnerable to operational disruptions that result in adverse effects on the airport and the National Airspace System.

Airfield design standards, including runway length and width, are based on the type of aircraft that use a particular airport. The FAA classifies aircraft by both approach speed and wingspan categories. There are five approach speed categories referred to as Aircraft Approach Categories (AAC) A through E and six aircraft wingspan classifications, which are referred to as Airplane Design Groups (ADG) I

through VI.[13] Based on the level of aircraft operations and guidance provided by the FAA in selecting the critical design aircraft for airfield planning purposes, Broward County has identified the Boeing 767-400[14] as the design aircraft for the future fleet mix at FLL. In FAA Order 5100.38C, *Airport Improvement Program Handbook*[15], the critical design aircraft is defined as that airplane using (or is highly likely to use) the airport on a regular basis of at least 500 annual itinerant operations. If there are more than one aircraft meeting these criteria then the most demanding in terms of approach speed and wingspan is used for planning different facility features, such as runway length, strength of paved areas, or lateral separations in airfield layout.

In FAA Advisory Circular 150/5300-13, Change 9, *Airport Design,* the Boeing 767-400 is identified as an approach Category D aircraft. During calendar year 2003 there were approximately 1,770 total operations by the Boeing 767-400 at FLL. With an overall wingspan of 170.3 feet, this aircraft is classified within ADG IV, which includes aircraft with a wingspan of up to, but not including 171 feet. The minimum runway width required for ADG IV aircraft to meet current FAA design standards is 150 feet. Therefore, 150 feet is the preferential runway width for all runway development alternatives considered in this Draft EIS analysis. This runway width is also adequate to accommodate up to and including ADG V aircraft, which includes the Boeing 747 and the Airbus 340. Appendix D.3, *Airfield Geometric Requirements,* provides the analysis explaining why existing Runway 9L/27R is designed to accommodate category ADG-IV aircraft with its length of 9,000 feet and width of 150 feet.

The overall width and lateral separation of the two parallel taxiways (G and H) that serve Runway 9R/27L restrict the use of this runway by the projected fleet mix, as well as the deficient length and width of Runway 9R/27L. These two taxiways have a width of 50 feet with a lateral separation of 250 feet from the runway. This separation is not sufficient for the design aircraft (i.e., Boeing 767-400) or any other aircraft in ADG-IV.

According to FAA Advisory Circular 150/5300-13, Change 9, *Airport Design*, a runway-to-taxiway centerline separation of 250 feet meets design standards for aircraft in approach category A and B (i.e., approach speeds of less than 121 knots) and ADG-II (i.e., wingspan of less than 79 feet) on runways with not lower than three-fourths of a mile approach visibility minimums. The 250-foot lateral separation does not meet design standards for aircraft in approach Category C or D (i.e., approach speeds of 121 to 166 knots), which restricts all air carrier aircraft, most regional jets, and a number of general aviation jets from using the runway while another aircraft is on the taxiway. By comparison, the taxiways supporting Runways 9L/27R and 13/31 currently comply with the ADG-IV standard taxiway

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[13] **FAA Advisory Circular 150/5300-13. *Airport Design*, Airplane Design Group.**

[14] **Letter to FAA Manager, Orlando Airports District Office from FLL Director of Aviation, Broward County Aviation Department, dated November 1, 2004. "This responds to your letter dated December 24, 2003 requesting information necessary for the preparation of the revised Environmental Impact Statement (EIS) for the proposed extension of Runway 9R/27L at the Fort Lauderdale-Hollywood International Airport."**

[15] **FAA Order 5100.38C, Airport Improvement Program Handbook. Effective Date June 28, 2005.**

width and lateral separation from the runway of 75 feet and 400 feet, respectively. This geometry conforms to the requirements for the current and projected fleet mix of air carrier, regional and general aviation jet aircraft at FLL.

3.3.2.2 Needed Parallel Runway Length

Departing aircraft typically need more runway length than arriving aircraft. Therefore, FAA used two methodologies to determine runway length needed for departures at FLL. The first method calculates the runway length needed to accommodate 90 percent of all departing aircraft at 90 percent of maximum fuel/payload. The result of this analysis method is that a runway length of 8,000 feet accommodates approximately 90 percent of the fleet operating at 90 percent maximum payload.

The second method calculates the runway length needed to accommodate departing aircraft based on aircraft type and destination. The result of this analysis method is that a runway length of 6,000 feet is the minimum length needed for 90 percent of the projected peak hour fleet at FLL.

Therefore, depending on the constraints of the development site, a secondary runway at FLL should be as close to 8,000 feet in length, plus grade adjustments, as practicable, but not less than 6,000 feet. These analyses are included in Appendix D.3, *Airfield Geometric Requirements.*

In addition, a runway length analysis based on landing requirements, was conducted to ensure that there was not an aircraft type that required a greater length for landing than for take-off. The analysis, included in Appendix D.3, *Airfield Geometric Requirements,* indicated that departure length was the critical calculation.

The operation of a particular aircraft on a particular runway can be limited by the available departure/landing distance of the runway, the runway's overall width, or the configuration of the taxiways that support it. With runways of sufficient length and width to accommodate projected aircraft in ADG-IV (comparable to existing Runway 9L/27R) on more than one runway, FLL could provide an enhanced and balanced airfield system capable of accommodating the current and projected air carrier fleet mix.

3.3.3 NEED FOR ADEQUATE TERMINAL GATE FACILITIES

Provide adequate terminal gate capacity to accommodate the projected passenger demand:

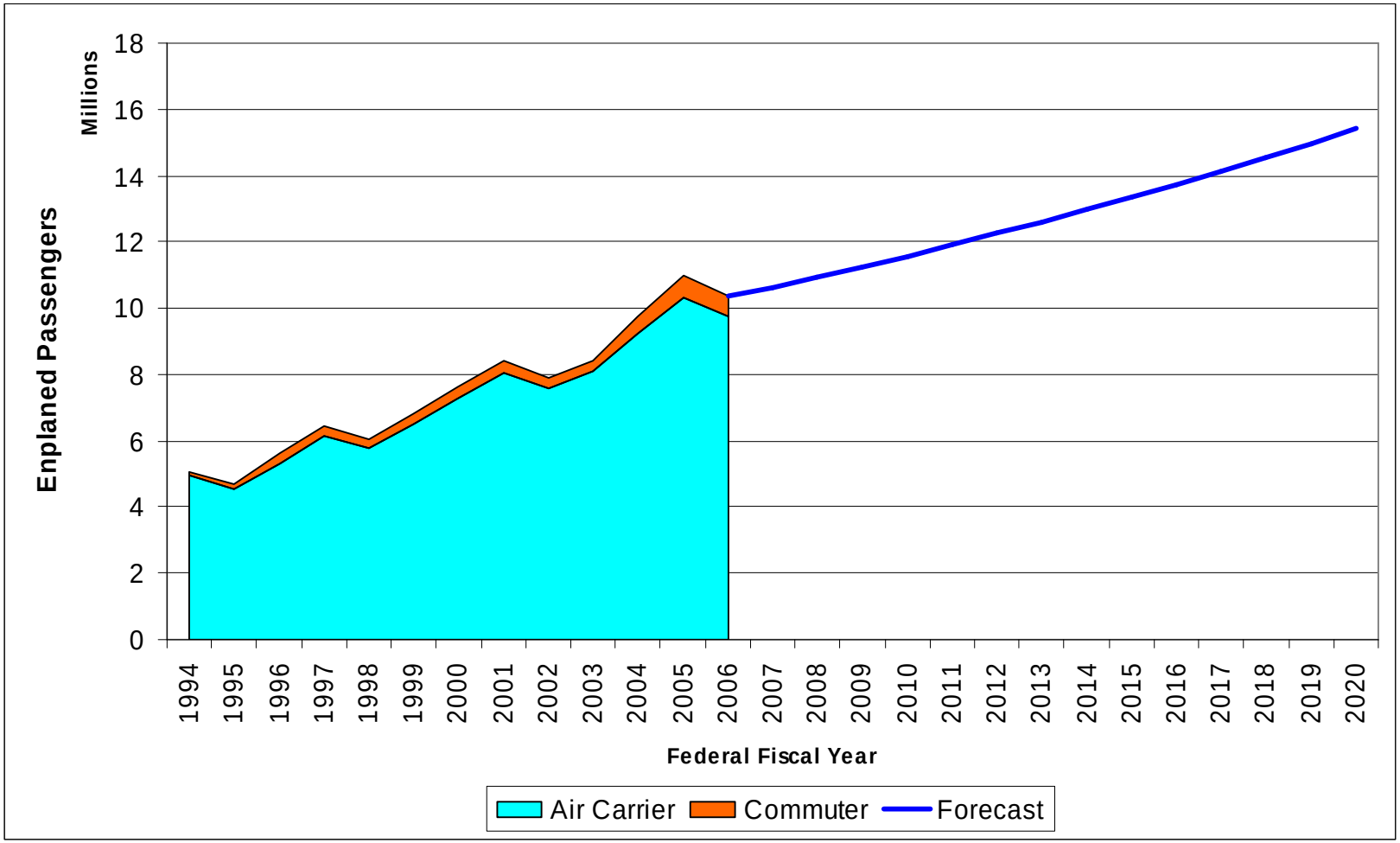
Although airfield capacity may be enhanced by runway improvements, the benefit of the enhanced capacity can be diminished if the number of gates is out of balance with airfield capacity. The projected passenger demand, in annual enplanements (people arriving and departing the aircraft), determines the number of gates needed.

The TAF reports enplaned passengers by air carrier and commuter, as graphically depicted on Exhibit 3-3, *FAA 2006 Terminal Area Forecast-Enplanements*. The FAA has estimated that, in 2006, 90.0 percent of FLL air carrier enplanements were domestic and 10.0 percent were international. By 2020, the FAA projects the domestic portion of air carrier enplanements to decline to 87.3 percent. International air carrier enplanements are projected to increase to 12.7 percent at FLL by 2020.

Currently, FLL has 57 aircraft gates. The FAA's assessment of the future terminal gate requirements evaluated: (a) the number of gates required to meet future demand compared to the existing 57 gates, and (b) the wingspan frontage[16] needed to accommodate the future gate requirements. The FAA's assessment of terminal gate requirements is found in Appendix D.2*, Future Terminal Gate Demand/Capacity Assessment*. Based on this assessment the FAA has projected that 59 to 69 gates could be needed in 2012, and that 67 to 77 gates could be needed in 2020. The wingspan frontage estimated in 2012 is 7,370 feet to 8,780 feet and in 2020 is 8,805 feet to 10,165 feet. The range of gates and wingspan frontage projected for 2012 and 2020 are based on alternative assumptions about the number of gates shared by multiple airlines. These projections are a reasonably conservative estimate of future needs. Other factors that could result in the need for a different number of gates include the number of airlines operating at the airport in the future, the size of aircraft that each airline operates, the need for international gates, the shape of the future terminal configuration, the limitations posed by the existing terminal configuration, and the degree of flexibility desired by the airport to accommodate a larger fleet of aircraft.

[16] **Wingspan frontage refers to the total wingspan frontage requirement and is calculated by using the wingspan dimension of each aircraft parked at the terminal combined with a wingtip separation of 25 feet between each aircraft.**

Exhibit 3-3
FAA 2006 TERMINAL AREA FORECAST-ENPLANEMENTS
Fort Lauderdale-Hollywood International Airport



Source: Landrum & Brown, 2007.

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3.4 PURPOSE OF THE PROPOSAL

Under 49 USC 47101(7), the FAA is charged with carrying out a policy ensuring "that airport construction and improvement projects that increase the capacity of facilities to accommodate passenger and cargo traffic be undertaken to the maximum feasible extent so that safety and efficiency increase and delays decrease."[17] The NPIAS)[18] supports the FAA goals identified in the *Flight Plan (2004-2008)*[19] for safety and capacity by identifying the specific airport improvements that will contribute to achievement of those goals.

FLL is a primary airport, identified in the NPIAS.[20] FLL is one of the more than 3,000 airports identified as significant to national air transportation and, therefore, eligible to receive grants under the FAA Airport Improvement Program (AIP).

To highlight the emphasis on enhancing capacity within the national airspace, Congress stresses the importance of airports to the economy and the priority of capacity projects to ease congestion in *Vision 100 Century of Aviation Reauthorization Act Public Law 108-176*. Congress directs the FAA as part of its overall air commerce missions, to encourage construction of capacity projects at congested airports, but qualifies this with the need to assess environmental impacts associated with these projects.

A capacity enhancement project is defined as any runway, taxiway, or other capacity-enhancing project. A congested airport is defined as an airport that accounted for at least one percent of all delayed aircraft operations in the U.S. for the most recent year of available data, and is listed in Table I of the *FAA's Airport Capacity Benchmark Report of 2001.*

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[17] **49 U.S.C. 47101(d)(1). Title 49 Transportation. SUBTITLE VII—AVIATION PROGRAMS PART A—AIR COMMERCE AND SAFETY subpart i—General CHAPTER 401—GENERAL PROVISIONS § 40101. Policy. (d) Safety Considerations in Public Interest.— In carrying out subpart III of this part and those provisions of subpart IV applicable in carrying out subpart III, the Administrator shall consider the following matters, among others, as being in the public interest: (1) assigning, maintaining, and enhancing safety and security as the highest priorities in air commerce.**

[18] **Department of Transportation. FAA. *National Plan of Integrated Airport Systems (NPIAS) (2005-2009)*. Report of the Secretary of Transportation to the United States Congress Pursuant to Section 47103 of Title 49, United States Code. September 30, 2004.**

[19] ***FAA Flight Plan 2004-2008*. Internet web site: http://www.faa.gov/apo/strategicplan/FAA_Flight_Plan.pdf#search=%22Flight%20Plan%20(2004-2008)%20for%20safety%20and%20capacity%22**

[20] **Department of Transportation. FAA. *National Plan of Integrated Airport Systems (NPIAS) (2005-2009)*. Report of the Secretary of Transportation to the United States Congress Pursuant to Section 47103 of Title 49, United States Code. September 30, 2004.**

In 2004, the FAA published three reports that identified FLL as one of the busiest airports in the U.S.[21] In one of those reports, *Capacity Needs in the National Airspace System,*[22] FAA identified FLL as one of 15 airports that will require additional capacity by 2013.

The FAA's *Airport Capacity Benchmark Report* of 2004[23] identified FLL as one of the 35 busiest airports in the U.S. (September 2004). Because of the urgency of meeting the capacity and demand requirements at FLL in the near future, this EIS is subject to the environmental streamlining provisions of the Vision 100 Act.[24]

Streamlining ensures that a level of urgency is placed on airport capacity projects at congested airports like FLL. It is intended to expedite and coordinate the environmental review process by ensuring that review priority be given to certain projects, timelines are effectively managed during the review process, interagency coordination is improved and expedited, undue delays are reduced, and accountability is emphasized. To this end, all Federal and state environmental agencies that have environmental review responsibilities for proposed airport capacity projects must be identified by the Secretary of Transportation and may enter into a Memorandum of Agreement (MOA) to implement and streamline the EIS process for proposed airport capacity projects.[25]

By exploring the capacity and demand issues at FLL, the FAA would fulfill its statutory responsibilities to administer the National Airspace System. The next step is to develop and evaluate a range of alternatives, including the Airport Sponsor's Proposed Project, which would resolve the delay and capacity deficiencies at FLL.

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[21] ***Capacity Needs in the National Airspace System: An Analysis of Airport and Metropolitan Area Demand and Operational Capacity in the Future*, FAA, June 2004.**
***Airport Capacity Benchmark Report 2004*, FAA, September 2004. Department of Transportation. FAA. *National Plan of Integrated Airport Systems (NPIAS) (2005-2009)*. Report of the Secretary of Transportation to the United States Congress Pursuant to Section 47103 of Title 49, United States Code. September 30, 2004.**

[22] ***Capacity Needs in the National Airspace System: An Analysis of Airport and Metropolitan Area Demand and Operational Capacity in the Future*, FAA, June 2004.**

[23] ***Airport Capacity Benchmark Report 2004*, FAA, September 2004.**

[24] ***Vision 100 Century of Aviation Reauthorization Act Public Law 108-176***

[25] **The FAA has actively coordinated with all Federal and state environmental agencies and developed an MOA to streamline the EIS process for the proposed runway extension at FLL. The FAA has executed MOAs with the U.S. Army Corps of Engineers (USACE), U.S. Fish and Wildlife Service (USFWS), U.S. Environmental Protection Agency (USEPA), Florida Department of Environmental Protection (FDEP), and Broward County. *See* Appendix A, *Agency Streamlining* for a summary of the streamlining process in accordance with the Vision 100 Act.**