MASTER PLAN UPDATE—Phase I

Draft Final
Summary Report

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Prepared for
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EXECUTIVE SUMMARY

This report provides a summary of the analysis and findings from Phase 1 of the Master Plan Update for Fort Lauderdale-Hollywood International Airport (the Airport or FLL). A companion Technical Appendices volume provides supplementary data and analyses that support the material presented in this summary report.

This summary report is organized in eight sections, as follows:

- Section 1 – Introduction
- Section 2 – Forecast Summary
- Section 3 – Accommodating the Forecast
- Section 4 – Financial Considerations
- Section 5 – Airfield Development, Land Use Issues, and Opportunities
- Section 6 – Terminal Area Development Options
- Section 7 – Support Facilities and General Aviation
- Section 8 – Phase 1 Conclusions and Preview of Phase 2

The principal findings from Phase 1 are summarized below, organized in relation to the eight sections of this summary report.

1. INTRODUCTION

Basis for the Master Plan Update - The Master Plan Update process was initiated in response to a motion approved by the Broward County Board of County Commissioners (the Board) on December 9, 2003, actions taken by the Board in 2004 to amend Leigh Fisher Associates’ contract with the County; and a Notice to Proceed issued by Broward County Aviation Department (BCAD) staff in November 2004.

Master Plan Update Objective – The objective of the Master Plan Update is to provide a comprehensive plan to guide and coordinate the development of Airport facilities through 2020. It is also intended that the Master Plan Update should serve to inform short-term development decisions by identifying the relationship between short-term decisions and longer-term options affecting the future potential of the Airport to serve the Broward County region.

Two-Phase Process – The County structured the Master Plan Update in two separate phases. Phase 1 consists of preparing optional development scenarios for consideration by the Board and for review by Airport stakeholders in Phase 2. In developing the optional scenarios, key factors such as the demand for air travel at FLL, affordability, other County policies, concerns about managed growth, and noise mitigation and environmental issues were to be given balanced consideration. Phase 2 consists of completing a comprehensive stakeholder outreach program, refining the options based on stakeholder input, assisting the Board in decision-making regarding a preferred option, and beginning the implementation process.

“Givens” for the Master Plan Update – Certain items were defined in the scope of work for the Phase 1 Master Plan Update process as “givens” and were, therefore, not subject to further review or analysis in the Master Plan Update. These “givens” included:

- Forecast Demand - The scope of work for the Master Plan Update stipulated that the FAA’s Terminal Area Forecast (TAF) issued in January 2003 be used as the basis for estimating facility requirements. No separate forecasts were developed or used in the Master Plan Update process.
- Facilities - Concourse A and Cruise Bus Facility, the international terminal facilities at the Terminal 4 site, and double-decking of the Airport exit roadway were all assumed as “givens” for the Master Plan Update.
- EIS Alternatives – Recognizing the simultaneous schedule of the Environmental Impact Statement (EIS) for the Proposed South Runway Extension, the Master Plan Update is required to adapt to the proposed airfield development alternatives subject to consideration in the EIS process.
- Port-Airport Integration – In evaluating development options in the Master Plan Update, it was assumed that a corridor will be preserved for potential construction of a people mover linking Port Everglades with the Airport.

2. FORECAST SUMMARY

Base Forecast - As required in the scope of work for the Master Plan Update, the January 2003 FAA TAF was used as the base forecast for the planning effort.

Enplaned Passengers – Based on the FAA TAF, enplaned passengers at FLL are forecast to increase an average of 3.8% per year through 2020 – somewhat less than the actual long-term historical growth rate of 4.9% per year.

Aircraft Operations – Based on the FAA TAF, aircraft operations at FLL are forecast to increase an average of 2.4% per year through 2020.

Share of Regional Traffic – Based on the FAA TAF, FLL’s share of regional domestic originating passengers accommodated at FLL, Miami International, and Palm Beach International airports is forecast to increase from 54% in 2005 to 60% in 2020. FLL’s share of regional international traffic is forecast to remain relatively constant at 10% through 2020.

3. ACCOMMODATING THE FORECAST

Planning Horizon - In line with the October 2004 County Objective Statement, the year 2020 was selected as the horizon for defining long-term facility needs at FLL. The final year of the FAA TAF issued in January 2005 is also 2020.

Airfield Development Requirements – Various analyses have indicated that the airfield alternatives under consideration in the South Runway Extension EIS would provide adequate airfield capacity to accommodate traffic forecast through the planning horizon of 2020. This result is endorsed in the FAA’s preliminary Purpose and Need statement for the EIS. In this context, airfield capacity requirements have not been independently analyzed in the Master Plan Update. Planning efforts instead are focused on ensuring that other planning initiatives are compatible with the airfield requirements under consideration as part of the South Runway Extension EIS process.

Aircraft Gate Requirements – Based on the assumption that the Airport will eventually accommodate seven passenger airline aircraft departures per gate per day (up from approximately six in 2005), which is consistent with gate utilization at many large-hub airports, a total of between 78 and 84 aircraft gates is estimated to be required to accommodate demand through 2020 (up from the current total of 57 gates).

Passenger Vehicle Parking Requirements – Based on an assumed ratio of 175 to 200 terminal area vehicle parking spaces per aircraft gate, which is consistent with the historical ratio provided at FLL with reduced customer inconvenience, approximately 6,000 additional parking spaces would be required within the terminal area to accommodate demand by 2020 (for a total of approximately 18,000 spaces in 2020).

Terminal Roadway Requirements – Analyses of roadway and curbside requirements indicate that improvements to roadways and curbsides in the vicinity of Terminals 2 and 3 will be required by 2015.

4. FINANCIAL CONSIDERATIONS

Total Financing Capacity – Analyses conducted as part of Phase 1 of the Master Plan Update indicate that the County has the capacity to fund anticipated airfield, terminal, landside, and ancillary facility needs at FLL through 2020, while maintaining airline costs at the Airport somewhat above the median range of those at large-hub airports nationwide. However, between now and 2020, the County will need to make important decisions about project phasing and the scale of projects to be undertaken in order to maintain affordability for Airport users throughout the period and beyond.

Funding of “Given” Projects – Completion of projects established as “givens” for the Master Plan Update, including completion of the Proposed South Runway Extension as defined by the County to date, will increase airline costs from the low end of the national range toward the median range.

Airline Cost Range for Airport Development Options – To fund needed improvements to the airfield (terminals), landside, and ancillary facilities, it is likely that airline costs will increase from the median of the national range once the “given” projects are implemented – potentially toward the 75th percentile of the range of costs reported for large-hub airports. The extent of the Airport’s financing capacity will depend on the target the County selects for airline costs per enplaned passenger. In the context of high demand for FLL access and facilities, phased departure from the County’s historical airline cost reduction goals.
may be a reasonable policy for the County to adopt to deliver needed facilities that will improve passenger levels of service.

Managing Future Airline Costs – To minimize future user costs, the Airport development strategy needs to (1) avoid high-cost capital projects that deliver marginal net capacity, (2) recognize that most new projects cannot be developed on “green field” sites and are, therefore, more likely to be relatively expensive, (3) define “expandable” projects that can be developed in a demand-responsive sequence, and (4) minimize the extent to which projects require large front-loaded investment that depends on subsequent traffic growth to make financial sense.

Mitigating Factors – A number of factors could materially and positively affect new capital project affordability above the baseline forecast, including, among other things, the potential for exceeding forecast traffic levels, a potential increase in the authorized PFC rate, and the willingness of users to bear the costs associated with new and expanded facilities.

Phase 2 Financial Decisions – In Phase 2 of the Master Plan Update, how best to balance airline costs, debt levels, and level of service provided to Airport users by the development of new facilities will be considered.

Specific Financial Plans – Specific financial plans for each facility development option considered in the Master Plan Update are presented in Section 6 of this report.

5. AIRFIELD DEVELOPMENT, LAND USE ISSUES, AND OPPORTUNITIES

Proposed South Runway Extension EIS Drives Future Airfield Configuration – Recognizing the simultaneous completion of the EIS for the Proposed South Runway Extension, the Master Plan Update must adapt to airfield development alternatives subject to consideration as part of the FAA’s EIS process.

South Runway Alternatives – In the motion adopted by the Board on December 9, 2003, the extension of Runway 9R-27L was designated as the County’s “Preferred Alternative” for future airfield development. In January 2006, the FAA identified two additional South Runway alternatives, which involve shifting the centerline of the South Runway to the north or to the south of its current location. The Master Plan Update is required to maximize compatibility with all of these alternatives.

South Runway Extension EIS Alternative B1 – This alternative (the County’s “Preferred Alternative”) is to extend the South Runway eastward to a length of approximately 8,600 feet at an elevation necessary to cross the Florida East Coast Railroad and US 1. The taxiways and retaining walls associated with this alternative would impose some limitation on terminal and apron development in the vicinity of existing Terminal 4.

South Runway EIS Alternative B4 – This alternative is to shift the centerline of the South Runway about 340 feet north of its current location, and to extend the runway to a length of approximately 6,000 feet, largely within the existing Airport boundary. This alternative would significantly reduce the area available for terminal development in the vicinity of existing Terminal 4, and would similarly constrain the availability of land for aviation-related development on the West Side of the Airport. Further, this alternative would likely require the continued availability of the Crosswind Runway for air carrier operations, which would further limit terminal development opportunities to the west of Terminal 3.

South Runway EIS Alternative B5 – This alternative is to shift the centerline of the South Runway about 300 feet to the south of its existing location and to extend the runway over the Florida East Coast Railroad and US 1. This alternative would add some land area that would be available for terminal development in the vicinity of existing Terminal 4, but would preclude potential development on the South Side of the Airport.

Decommissioning of the Crosswind Runway – As stipulated in the Board’s December 9, 2003, motion cited above, the Crosswind Runway (Runway 13-31) was evaluated as part of the Master Plan Update process. The evaluation indicated that the Crosswind Runway offered limited capacity enhancement benefits in the context of other airfield capacity enhancements being pursued by the County, and that its decommissioning would make available an additional 50 acres for terminal development, and a further 20 acres for support facility development on the West Side. The decommissioning of the Crosswind Runway was included in the October 2004 County Objective Statement.

North Parallel Runway — As stipulated in the Board’s December 9, 2003, motion cited above, the potential to construct a north parallel runway was analyzed as part of Phase 1 of the Master Plan Update. The analysis indicated that significant long-term capacity benefits could be achieved from the development of a north parallel runway, and the option to construct such a north parallel runway should be preserved in future planning for the ultimate build out of the Airport site.

6. TERMINAL AREA DEVELOPMENT OPTIONS

Terminal Area Development Options – Over the course of Phase 1 of the Master Plan Update, a wide range of options was defined and analyzed for the development of terminal facilities to accommodate forecast demand through 2020. The full range of options considered is described in the Phase 1 Technical Appendixes volume. Each option was considered in the context of four key criteria: (1) accommodation of forecast demand, (2) affordability, (3) implementation phasing, and (4) level of service.

Five Options Developed for Further Consideration — From all of the terminal area development options considered, five were selected for stakeholder consultation and refinement in Phase 2. The five options generally fall in two categories. Each category of options is designed to provide facilities that would accommodate demand over a short term (10 – 15 year) timeframe. The first category of options, referred to as “additive” options, would provide for short-term needs by adding capacity to existing structures with the minimum of demolition and redevelopment. The other category of options, referred to as “redevelopment” options, would provide for short-term needs through the redevelopment of existing structures and facilities.

However, only the redevelopment options would preserve the County’s ability to pursue longer-term development at the Airport beyond the 10 – 15 year timeframe. An evaluation of the five options is provided in Section 6 of this summary report, as summarized below.

Additive Development – Option 1A – This option (shown on Figure ES-1) includes proposed Concourse A, the T4 narrowbody domestic terminal, and extensions to existing Concourses E and F. Option 1B would be less expensive than Option 1A, and would meet short-term growth needs.

Additive Development – Option 1B – This option (shown on Figure ES-2) includes proposed Concourse A, a T4 narrowbody domestic terminal, and extensions to existing Concourses E and F. Option 1B would be less expensive than Option 1A, and would meet short-term growth needs.

term growth potential. This option is compatible with all alternatives under consideration in the Proposed South Runway Extension EIS, except Alternatives B4 and D2 (which include moving the South Runway centerline to the north by approximately 340 feet), and assumes retention of the Crosswind Runway.

Additive Development – Option 1B – This option (shown on Figure ES-2) includes proposed Concourse A, a T4 narrowbody domestic terminal, and extensions to existing Concourses E and F. Option 1B would be less expensive than Option 1A, and would meet short-term growth needs.

Figure ES-1

Figure ES-2

Additive Development Option 1A

Additive Development Option 1B

ES-2
If the current runway location and alignment are maintained, the South Side can accommodate overflow surface parking. If Runway 9R-27L is displaced to the north, future general aviation activity could be accommodated on the South Side.

General Aviation – According to the FAA TAF, general available south of T4 to provide for dual taxiways for the large narrowbody class of aircraft (Group III). In the long-term, Option 1B would conflict with Alternative B4, which retains the Crosswind Runway.

Redevelopment – Option 2A – This option (shown on Figure ES-3) includes proposed Concourse A, the T4 International Gateway terminal, and significant alterations to Terminals 2 and 3, including a satellite midfield terminal that could be phased to meet short-term and long-term gate demand, together with reconfigured parking and roadways. This option would maintain passenger level of service standards, and accommodate forecast demand to 2020 and beyond. This option is compatible with all EIS alternatives under consideration, except Alternatives B4 and D2 (which include moving the South Runway centerline to the north by approximately 340 feet), and retaining the Crosswind Runway.

Redevelopment – Option 2B – This option (shown on Figure ES-4) includes proposed Concourse A, a T4 narrowbody domestic terminal and significant alterations to Terminals 2 and 3, including a satellite midfield terminal that could be phased to meet short-term and long-term gate demand, as well as reconfigured parking and roadways. Under Option 2B, it is assumed that widebody/international traffic would use the Terminal 3 satellite. This option would maintain passenger level of service standards, and accommodate forecast demand to 2020 and beyond, but it would be more expensive than Option 2A. This option is generally compatible in the short term with all EIS alternatives under consideration. However, the location of the South Runway in Alternatives B4 and D2 would limit the area available south of T4 to provide for dual taxiways for the large narrowbody class of aircraft (Group III). In the long-term, Option 2C would conflict with Alternative B4, which retains the Crosswind Runway.

Further Review and Refinement in Phase 2 – During Phase 2, these five options will be reviewed fully with stakeholders, refined as appropriate, and subject to evaluation by the Board before the preferred option is selected.

7. SUPPORT FACILITIES AND GENERAL AVIATION

West Side Development Plan – The West Side of the Airport is currently underutilized. About 130 acres of land are currently available for development and provide opportunities for the flexible use of land based on the County’s long-term development goals. A proposed land use plan for the West Side is outlined in Section 7 of this summary report. The plan calls for (1) consolidation of general aviation facilities on the West Side, (2) reservation of land for future general aviation, air cargo, and Airport support facilities on the West Side, and (3) a flexible long-term plan capable of accommodating the possible relocation of existing North Side facilities.

South Side Development Plan – Development options for the South Side will be substantially determined by which South Runway development option is selected during the Proposed South Runway Extension EIS process.

If the current runway location and alignment are maintained, the South Side can accommodate overflow surface parking. If Runway 9R-27L is displaced to the north, future general aviation activity could be accommodated on the South Side.

General Aviation – According to the FAA TAF, general available south of T4 to provide for dual taxiways for the large narrowbody class of aircraft (Group III). In the long-term, Option 2C would conflict with Alternative B4, which retains the Crosswind Runway.

Redevelopment – Option 2A – This option (shown on Figure ES-3) includes proposed Concourse A, the T4 International Gateway terminal, and significant alterations to Terminals 2 and 3, including a satellite midfield terminal that could be phased to meet short-term and long-term gate demand, together with reconfigured parking and roadways. This option would maintain passenger level of service standards, and accommodate forecast demand to 2020 and beyond. This option is compatible with all EIS alternatives under consideration, except Alternatives B4 and D2 (which include moving the South Runway centerline to the north by approximately 340 feet), and retaining the Crosswind Runway.

Redevelopment – Option 2B – This option (shown on Figure ES-4) includes proposed Concourse A, a T4 narrowbody domestic terminal and significant alterations to Terminals 2 and 3, including a satellite midfield terminal that could be phased to meet short-term and long-term gate demand, as well as reconfigured parking and roadways. Under Option 2B, it is assumed that widebody/international traffic would use the Terminal 3 satellite. This option would maintain passenger level of service standards, and accommodate forecast demand to 2020 and beyond, but it would be more expensive than Option 2A. This option is generally compatible in the short term with all EIS alternatives under consideration. However, the location of the South Runway in Alternatives B4 and D2 would limit the area available south of T4 to provide for dual taxiways for the large narrowbody class of aircraft (Group III). In the long-term, Option 2C would conflict with Alternative B4, which retains the Crosswind Runway.
"Expandable" Options a Key Strategy – A key strategy is for future development options to be incrementally "expandable" so that the County can manage growth incrementally in response to demand, and in response to the progressive development of the airfield.

Certain Lower-cost Development Options Limit Future Expansion – Certain lower cost options to provide capacity by expanding current facilities (rather than redeveloping them) may limit the potential of the Airport to accommodate demand after 2020.

Link Between Airport Development and Environmental Programs – The County should recognize the need to irrevocably link Airport development programs with aggressive noise mitigation and other environmental programs to maximize compatibility between the Airport and its environs.

Phase 2 Stakeholder Outreach an Important Input to Decision-making – Phase 2 will provide the broad input necessary for the County to make a fully informed decision about preferred development strategies, and to resolve trade-offs concerning cost, level-of-service, and potential to accommodate demand beyond 2020.

Preview of Phase 2

Three Key Elements of Phase 2 – Phase 2 of the Master Plan Update includes three key elements – stakeholder outreach, support for the Board’s decision-making process, and implementation planning.

Stakeholder Outreach – Phase 2 will include a comprehensive program of outreach to key stakeholders, including Airport users, the airlines, Airport neighbors, and other interested groups. The purposes of the outreach program will be to (1) present the development options outlined in this report, and (2) receive comments, which will help refine the options and provide input to decision-making by the Board.

Board Decision-making Process – Phase 2 will also include support for the decision-making process concerning the adoption of a preferred development option. Key linkages that will be considered during this decision-making process will include trade-offs between level-of-service and cost, the interface between the airfield development alternative recommended from the Proposed South Runway Extension EIS process and the terminal area development option selected as “preferred” by the Board, and specific decisions regarding access, roadways, and parking.

Implementation – Following the Board’s designation of a preferred development plan for FLL, Phase 2 will include support for securing the necessary government agency approvals to proceed with implementation. Such approvals will include FAA approval of the updated Airport Layout Plan, and coordination with State, County, and local officials as required to amend the County’s Comprehensive Plan.
This document provides a summary of the analysis and findings from Phase 1 of the Master Plan Update for Fort Lauderdale-Hollywood International Airport (the Airport or FLL).

This section of the report provides background to the Master Plan Update objectives and the process to be followed, presented under the following headings:
- Background to the Master Plan Update
- Master Plan Update – Objective and Process
- Starting Point for the Master Plan Update
- Key Considerations for Planning
- Link between Phase 1 and Phase 2

1.1 BACKGROUND TO THE MASTER PLAN UPDATE

The FLL Master Plan Update was initiated in response to an approved motion by the Broward County Board of County Commissioners (the Board) on December 9, 2003. Among other things, this motion called for the Broward County Aviation Department (BCAD) to:

- Commence the process of updating the Airport Master Plan to include concepts that decommit the crosswind runway, and define a framework for managing aircraft operational demand and growth through planned facility development... and examine mechanisms for limiting future [aircraft arrivals] through infrastructure development, the number and location of gates and other means, including the review of the westside land use Master Plan [and] evaluate a North Parallel runway while preferring the South runway.

The directive to update the FLL Master Plan was part of the Board’s endorsement of a program to extend Runway 9R-27L (the South Runway) within a defined envelope to accommodate operations by the air carrier aircraft fleet projected to serve the Airport.

Subsequent to actions referenced above, the Board approved the County Objective Statement as an input to the Federal Aviation Administration’s (FAA’s) Environmental Impact Statement (EIS) process for the proposed expansion of FLL’s airfield. Among other things, the 2004 County Objective Statement established a goal to “enhance FLL’s capacity to accommodate forecast traffic through the year 2020...” without unreasonable delay for aircraft operations at the Airport.

Inherent in these approvals is a goal to accommodate forecast traffic growth at FLL through the expansion of facilities. This goal is consistent with Development Orders for expansion of the Airport (as approved in 1997 by the City of Fort Lauderdale, the City of Hollywood, and Broward County), which envisioned that the Airport would have three air-carrier-capable runways and passenger terminals with a total of 79 gates. In 2003, the Board voted to examine options for shortening one of these runways—Runway 13-31, the Crosswind Runway—and in 2004, the County Objective Statement established a goal to decommission this runway.

1.2 MASTER PLAN UPDATE - OBJECTIVE AND PROCESS

The objective of the Master Plan Update is to provide a comprehensive plan to guide and coordinate the development of future Airport facilities. The Master Plan Update identifies forecast demand, and outlines a plan for the balanced development of landside, terminal, airfield, and ancillary facilities to accommodate demand in a way that is affordable, and consistent with the broader policies and goals of the County. It is also intended that the Master Plan Update should serve to inform short-term planning decisions by identifying the relationship between short-term decisions and longer-term implications.

The County structured the Master Plan Update process in two separate phases, as follows:

Phase 1 – The purpose of Phase 1 is to identify Airport capacity needs based on forecast demand over the next 20 years, present alternative Airport development scenarios to the Board reflecting balanced consideration of key factors (such as affordability, other County policies, and concerns about managed growth), and provide guidance concerning coordination between short-term decisions and the long-term vision for the Airport site.

Phase 2 – The purpose of Phase 2 is to complete a comprehensive stakeholder outreach program based on the development options identified in Phase 1, refine the options and findings based on stakeholder input, report the results to the Board, assist the Board in decision-making regarding the adoption of a preferred plan, and begin the implementation process for the plan once adopted.

In this context, the results of Phase 1 should be considered as preliminary, and subject to refinement (1) during the Phase 2 Master Plan Update process, and (2) to ensure compatibility with the ongoing Proposed South Runway Extension EIS.

1.3 STARTING POINT FOR THE MASTER PLAN UPDATE

The most recent update to the FLL Master Plan was completed in 1994. Since that time, FLL’s passenger traffic has more than doubled, the mix of airlines serving the Airport has fundamentally changed, the fleet of aircraft serving FLL has changed, and the economics of the airline industry have become more uncertain.

During this period of change, the County successfully completed a $650 million capital program, which delivered new and improved access and passenger terminal facilities. These facilities include Terminal 1 with 19 gates, the Hibiscus Garage, the Rental Car Center and Cypress Garage, double-decking of the inbound roadway, and a new interchange between the Airport roadway system, US 1, and I-95.

Recognizing that the facility development process at FLL is ongoing, the following items were deemed to be “givens” and were not subject to additional review or analysis in Phase 1 of the master planning effort:

- **Facilities** - Concourse A and the Cruise Bus Facility, the international terminal facilities at the Terminal 4 site, and double-decking of the Airport exit roadway are all projects for which the County is expending planning and design funds, and these projects were not to be reviewed as part of the Master Plan Update.

- **EIS Alternatives** - The County has re-initiated the FAA’s EIS process to gain approval of the Proposed South Runway Extension. As of January 2006, the FAA’s EIS process identified a set of five alternative airfield development projects beyond the “Preferred Alternative” provided by the County to the FAA. An overriding directive for the Master Plan Update has been that development options shall be compatible with the alternatives being considered in the EIS process.

**Forecast Demand and Traffic** – The County Objective Statement established a goal to accommodate forecast traffic through the year 2020. The FAA’s Terminal Area Forecast (TAF) issued in January 2005 is being used as the basis for evaluating airfield alternatives in the FAA’s EIS process. As required by the Master Plan Update scope of work, the forecast being used in the EIS is a “given” for defining optional development scenarios in Phase 1 of the Master Plan Update. While the most recent FAA TAF does not provide a forecast beyond 2020, the compatibility of optional development scenarios is to be considered in the Master Plan Update process in the context of growth that may occur at the Airport beyond the forecast horizon.

**Port Airport Integration** – The County has begun an environmental assessment of an automated people mover system planned to provide service between the passenger terminals at FLL, an Intermodal Center east of FLL, and Port Everglades. It was assumed in the Master Plan Update that a corridor for this people mover will be preserved within the Airport boundary.

In addition to these “givens,” certain early analysis undertaken as part of this Master Plan Update and decisions made by the Board during the course of Phase 1 have also been incorporated as “fixed” components of the future development plan for the Airport. These include:

- **Decommissioning of Crosswind Runway** - At the request of the Board, the Phase 1 scope of work included an evaluation of the necessity for and utility of the Crosswind Runway. As outlined in Section 5 of this summary report, it was concluded that (1) the Crosswind Runway would have little or no operational value if the South Runway is extended as planned, (2) the Crosswind Runway is likely to be physically incompatible with the South Runway extension if the extension is constructed consistent with the value engineering study completed by URS in February 2005, and (3) the land area at the core of FLL would be better used and more valuable for passenger terminal and support facilities than for a limited-use
runway. The County Objective Statement included as a goal the future decommissioning of the Crosswind Runway, which was therefore assumed as a basis for planning in this Master Plan Update.

North Parallel Runway – Development of a “close parallel” runway between the current location of Runway 9L-27R (the North Runway) and the current northern boundary of the Airport is included as an alternative in the FAA’s EIS process for the Proposed South Runway Extension, and was evaluated as an option in the November 2003 Leigh Fisher Associates (LFA) report, Assessment of Airfield Alternatives. In conjunction with work on the Master Plan Update, LFA was asked to review the advisability of retaining the option to develop the north parallel runway. It was concluded that preserving the option for a north parallel runway is advisable, at least until (1) the EIS process determines how the airfield at FLL is best expanded, (2) the South Runway is extended, as proposed in the County’s “Preferred Alternative,” or (3) the FAA opines on the proposed use restriction for landings of larger aircraft on Runway 9R, after extension. Preservation of the potential to develop a north parallel runway was, therefore, assumed as a basis for planning in this Master Plan Update.

General Aviation Facilities – In recent years, general aviation service providers at FLL have sought to expand facilities to accommodate current and forecast demand. The Master Plan Update scope of work included an examination of the potential role and facilities for general aviation at FLL. It was concluded that (1) while the share of general aviation operations at FLL is high relative to that of other congested airports nationally, FLL’s share of regional general aviation traffic is low, (2) the FAA TAF indicates only limited increases in future general aviation operations at FLL, (3) the presence of general aviation facilities in multiple areas of the Airport contributes to operational inefficiencies, (4) Broward County should establish policies that consolidate general aviation facilities into one area of the Airport (provisionally defined as the West Side area south of Lee Wagener Boulevard), and (5) Broward County should charge general aviation operators landing fees that, at a minimum, are equivalent to those paid by other airfield users. Preservation and consolidation of general aviation facilities were, therefore, assumed as a basis for planning in this Master Plan Update.

1.4 KEY CONSIDERATIONS FOR PLANNING

At FLL, a number of unique factors need to be recognized and considered in the planning process, including the following:

Constrained Site – FLL is significantly land constrained, with little undeveloped land available to accommodate expanded facilities. Transportation infrastructure barriers effectively constrain contiguous expansion of the Airport site. Also, numerous residential and open space areas border the Airport, creating the potential for significant environmental impacts associated with Airport development, particularly in regard to noise exposure associated with aircraft operations. In this context, planning for expansion of Airport facilities must necessarily focus on the highest and best use of all available land, and environmental impacts associated with development must be explicitly considered.

Increasing Complexity and Risk of Development – Compounding the space constraints described above, most of the Airport site is now developed, so future development will likely require “redevelopment” of existing facilities. Such redevelopment is likely to be more expensive than new construction on undeveloped sites, and more disruptive and challenging to phase and build. As discussed elsewhere in this report, the County’s interest in decommissioning the Crosswind Runway is principally motivated by aircraft noise management objectives, but also serves to provide an on-time opportunity to plan the re-use of land contiguous with existing passenger and support facilities.

Air Traffic Growth Impacts – The County is in the process of updating FLL’s 1994 Noise Compatibility Study, following the guidelines contained in Federal Aviation Regulations (FAR) Part 150, “Airport Noise Compatibility Planning.” It is anticipated that this update will result in recommendations in 2006 that will lead to noise abatement procedures and policies to mitigate existing noise exposure in nearby areas and forecast noise exposure associated with new airfield facilities and increased aircraft operations.

Cost and Affordability – Airport operators are increasingly under pressure to consider the cost implications of development decisions, particularly by airlines. Fewer large-scale development projects have been initiated at origin-destination airports since the restructuring of the airline industry began in 2001. As a result of the changes in the airline industry and the increased focus on cost management, the affordability of master plan recommendations requires evaluation. Broward County is unique in starting the Master Plan Update from a position of having very low Airport rates and charges for airlines and other aeronautical users. While there may be no strategic reason for FLL to remain in the range of lowest-cost airports given demand levels, airline views on future projects that increase costs further are a factor in the development decision-making process.

In the planning context described above, the following key factors were considered in developing the Airport development options outlined in this report:

Balanced Capacity – The Master Plan Update should result in recommended facilities that balance airfield, terminal, and landside capacity.

Airfield Priority – Given land constraints, airfield facilities necessarily define the residual land envelopes available for other needed development. Given the simultaneous EIS process, this Master Plan Update was undertaken with a goal of developing plans that are compatible with whichever EIS alternative is selected.

Affordability – Higher cost “demand dependent” terminals and other facilities requiring large volumes of forecast traffic to both materialize and be accommodated effectively constrain contiguous expansion of the Airport (provisionally defined as the West Side areasouth of Lee Wagener Boulevard), and (5) Broward County should charge general aviation operators landing fees that, at a minimum, are equivalent to those paid by other airfield users. Preservation and consolidation of general aviation facilities were, therefore, assumed as a basis for planning in this Master Plan Update.

1.5 LINK BETWEEN PHASE 1 AND PHASE 2

As outlined previously, the scope for Phase 1 of the Master Plan Update process was geared to options for the future development of the Airport. These options are intended to provide a means to generate stakeholder reaction and input, facilitate policy discussions about the future size and role of FLL, and assist the Board in its deliberations and decision-making during Phase 2 of the Master Plan Update process. Of necessity, these deliberations must take place in an environment of uncertainty, particularly with regard to the following:

- The type of airfield development the Proposed South Runway Extension EIS process will support, if any.
- The financial health of the airline industry and the potential for increased costs at the Airport to be within an acceptable range.
- The actual rate of growth, compared to forecast growth, in traffic at the Airport.
- How much traffic the County will ultimately seek to accommodate at FLL given County goals related to mitigating aircraft noise and managing the effects of growth.

All options outlined in this report should, therefore, be considered preliminary, and subject to change during Phase 2 of the Master Plan Update process.
2 FORECAST SUMMARY

2.1 INTRODUCTION AND BACKGROUND

Traffic forecasting is a fundamental input to master planning, including long-term forecasts of annual demand, derivative statistics related to peak-period demand, and future demand by industry segment. Traffic forecasts are subject to frequent revision and update. For example, the FAA updates its Terminal Area Forecast (TAF) annually. Currently, a consensus exists among regional and national forecasts that growth will continue in the near-term and long-term. Nationwide, the long-term historical trend has continued to exhibit consistent growth, despite periodic major adverse cyclical developments and individual events, as shown on Figure 2-1. Generally, Sun Belt regions of the United States are expected to exceed the annual average growth rates. However, it should be noted that most forecasts of traffic are "unconstrained forecasts" of demand, which are based on an assumption that airline capacity, air traffic systems, and airport facilities will be available to accommodate underlying demand.

At FLL, traffic has increased significantly since the early 1990s, attributed primarily to strong regional economic growth, significant expansion of service by existing and new entrants, including low-fare airlines, and the resulting increasing share of regional passenger activity accommodated at FLL relative to competing commercial service airports in South Florida.

2.2 FORECAST ANNUAL DEMAND

As discussed in Section 1 and as called for in the scope of work and work plan, the FAA TAF was used as the "base" forecast for the FLL Master Plan Update.

Enplaned Passengers – Figure 2-2 presents a summary of annual enplaned passengers, as presented in the FAA TAF published in January 2005. Enplaned passengers at FLL are forecast to increase an average of 3.8% per year. This is somewhat lower than the actual long-term growth rate of 4.9% (from 1980 to 2004), which consistently surpassed forecasts for the period. However, the current forecast rate of growth below historical levels is not unreasonable for planning purposes given the larger base of activity and substantial market penetration by the low-fare airlines.

Aircraft Operations – Figure 2-3 presents a summary of annual aircraft operations, as presented in the FAA TAF. The FAA forecasts annual aircraft operations to increase an average of 2.4% per year from 2004 to 2020. As shown on Figure 2-3, through 2004 there had been significant changes in the composition of aircraft operations at FLL—
The national and regional outlook is for continued long-term growth in aviation demand. For the forecast period through 2020, the FAA forecasts that virtually all of the growth in aircraft operations at FLL will be driven by increases in commercial air carrier aircraft operations. The share of the total represented by air carrier operations is forecast to increase from 55% in 2004 to 63% in 2020.

2.3 DERIVATIVE FORECASTS

To assess facility development alternatives for FLL, traffic components need to be forecast on a detailed basis. A companion technical report provides detailed information on derivative forecast elements used for certain aspects of the FLL Master Plan Update, such as passengers by flight stage length, peak month demand, and daily activity patterns. Derivative forecasts were developed using assumptions regarding key factors and ratios, which were applied to the base annual demand forecasts.

2.4 SHARE OF REGIONAL TRAFFIC

Figure 2-4 shows historical and FAA forecast numbers of enplaned passengers at the three air carrier airports serving South Florida—FLL, Miami International (MIA), and Palm Beach International (PBI) airports. According to the FAA TAF, FLL’s share of regional passenger activity is expected to continue to increase between 2005 and 2020 (see Figure 2-5). However, while FLL’s share of regional domestic originating passengers increased substantially, from 31% in 1990 to 54% in 2005, this share is forecast to increase much more gradually in the future—reaching about 60% in 2020 (see Figure 2-6).

Noteworthy in the FAA TAF, for the purposes of facility planning for FLL, is that while the Airport’s share of domestic originating passengers is forecast to increase at a reduced rate of growth, the share of international passengers is forecast to remain relatively constant at 10% through 2020 (see Figure 2-7). The implications of this forecast on facility planning will be addressed during Phase 2 of the Master Plan Update process and will also be considered in the FAA’s Proposed South Runway Extension EIS process given the use of the FAA TAF in that process.

2.5 SUMMARY

As stipulated in the scope of work regarding consistency with the FAA’s process for the Proposed South Runway Extension EIS, the forecasts presented herein summarize the FAA’s outlook for future growth in aviation demand at FLL. Nevertheless, uncertainty and risk will always be present when discussing aviation activity forecasts, considerations that have become more prevalent since September 11, 2001. From a facility planning perspective, while the FAA TAF is generally consistent with other available forecasts, year-to-year variations in activity can be expected. To accommodate the inherent uncertainty regarding future traffic levels, both nationally and at FLL, facility plans that demonstrate flexibility and responsiveness undoubtedly have a higher value to an airport operator than front-loaded development programs that are dependent on the realization of traffic forecasts well into the future.
One of the primary functions of an airport master plan is to define the mix of facilities to best accommodate various categories of forecast activity, including enplaned and deplaned passengers, freight volume, and aircraft movements. A master plan should also aim to balance the capacity of various elements so that the airport operates in an integrated and efficient manner over time. For example, the benefits of an investment in improved and/or expanded passenger terminal facilities would not be realized if the capacity of the airfield were not sufficient to accommodate the number of flights that the terminal complex could potentially handle during a busy period. The converse is equally true.

Phase 1 of the Master Plan Update was focused on defining development opportunities among and between the airfield, the terminal complex, and the supporting areas at FLL. This section provides an overview of the factors considered in Phase 1 when estimating the facility development needs for each of these areas and previews further refinements anticipated to be addressed in Phase 2.

Planning Horizon – The planning horizon establishes the outer year for which particular forecast activity levels are to be accommodated in a master plan. (Of course, the potential for accommodating activity levels beyond the planning horizon in regard to land use and facility configuration, at a minimum, should also be considered.)

In October 2004, the Board adopted the County Objective Statement, which established that airfield improvements shall “enhance FLL’s capacity to accommodate forecast traffic through the year 2020.” To ensure that planning for Airport facilities and the endorsed airfield improvements are in balance, forecast activity in 2020 was also the basis for defining long-term facility needs for the Master Plan Update to date.

Demand Forecast – As noted earlier in this document, to ensure consistency with the ongoing Proposed South Runway EIS process, the FAA TAF, issued in January 2005, was used as the source forecast for the Master Plan Update. The TAF provides forecasts for various categories of aircraft operations and for domestic and international enplaned passengers.

Facilities Assessment – The findings to date regarding facility needs to accommodate forecast demand through 2020 are summarized below.

3.1 AIRFIELD DEVELOPMENT
The FAA’s preliminary Purpose and Need statement for the Proposed South Runway Extension EIS, issued in January 2006, established a goal of improving the airfield at FLL so as to accommodate forecast demand through 2020 without unreasonable levels of aircraft delay. This goal is consistent with the County Objective Statement referenced earlier. Previous FLL airfield studies have indicated that the goal of accommodating 2020 demand while minimizing delay is achievable within the set of airfield alternatives now being considered in the Proposed South Runway Extension EIS process. For master planning purposes in Phase 1, an assumption, or a “given,” was that the preferred airfield alternative that emerges from the FAA’s EIS process will provide the necessary capacity through the planning horizon, thereby confirming a work scope assumption that additional areas for airfield expansion beyond those under study in the FAA’s EIS process need not be considered in the Master Plan Update. Therefore, a central challenge for the master planning process is to define, in parallel with the EIS process, a series of flexible non-airfield development options for the Airport that are compatible with the multiple airfield alternatives being reviewed by the FAA. (See Section 5, Airfield Development, Land Use Issues, and Opportunities.)

3.2 TERMINAL COMPLEX
Various planning metrics are typically used to establish the size or quantity of elements that would be needed within the terminal complex to accommodate forecast levels of activity at reasonable service levels. Certain types of “industry standard” planning metrics are adapted based on the unique character of a specific airport when initiating a master plan, while others are based on the observed use patterns at the airport. For FLL, one metric was based on activity patterns at other U.S. airports similar in character to FLL, a second was based on historical demand patterns at the Airport, and a third followed standard industry practices. The results for each example are presented in the following paragraphs.

- **Aircraft Gates** – A planning metric was developed for FLL in Phase 1 that associates forecast levels of passenger aircraft operations with the estimated number of required gates. Based on throughput observed at other U.S. origin-destination airports, industry trends, and potential efficiency benefits arising from improvements to the FLL terminal complex, it was assumed that FLL will eventually accommodate up to seven passenger aircraft departures per gate per day. In the long term, this throughput capacity per gate translates to a projected need for 78 to 84 gates at FLL by the year 2020. (See Figure 3-1 and Appendix B-3.) However, it is worth noting that higher levels of efficiency in the terminal areas are likely to be achieved prior to 2020.

- **Passenger Vehicle Parking** – No airport industry standard is available or would be useful in planning future parking facilities at FLL. Parking demand at each airport differs based on variations in the resident/non-resident traffic split, the location of an airport relative to the source of a residents’ ground trip, and the availability of convenient and fast public transit, among other things. Based on previous analysis of parking demand patterns at FLL, a ratio of 175-200 parking spaces per gate was determined to be the best means of estimating a reasonable supply of parking spaces within the terminal complex. The previous analysis also established the need for an additional 30% of parking spaces for peak and holiday seasons remote from the terminal complex, most likely in at-grade parking lots. Therefore, a total of about 17,000 spaces would be needed in the terminal area by 2020 to accommodate demand with service levels.
roughly similar to those experienced today (see Figure 3-2).

- **Terminal Roadway Capacity** – A roadway traffic and curbside capacity assessment was conducted in Phase 1 to establish the capacity of the existing terminal complex roadway system and curb frontage. The purposes of this assessment were to (1) estimate vehicle flows and stationary pick up/drop-off activity at the terminal curbs, and identify the interface between these two activities, at forecast traffic levels, and (2) estimate the degradation of service levels in the absence of improvements through 2020. A combination of standard measures of vehicle capacity per lane was used for roadways and observations regarding curbside activity at FLL. The findings of that assessment indicate that increased capacity and other improvements to the roadway system, particularly in the vicinity of Terminals 2 and 3, will need to be in place within approximately 10 years to avoid significant disruption of through traffic and curbside vehicle traffic flow during peak periods. As might be expected given the known shortfalls of the existing roadway design, these improvements would include, at a minimum, modifications to the roadway geometry and additional vehicle lanes in the vicinity of Terminals 2 and 3, which are discussed in more detail in Section 6.

An inherent shortfall in the existing FLL roadway design is the lack of passenger pick-up/drop-off areas that are physically separated from the roadway, particularly on the upper level roadway. Therefore, either excess through traffic on the roadway or increased dwell time at the terminal curbs will degrade the roadway system’s performance because the operations “interfere” with one another. For example, while peak hour curbside traffic at Terminal 2 may be limited by the number of gates at the terminal, increased through traffic generated by expansion elsewhere will increase congestion, bottlenecks, and the potential for gridlock.

- **Support Functions and Other Activities** – This element includes the facility needs for such activities as general aviation, fixed base operators, air cargo operations, and aircraft maintenance and for support functions such as aircraft rescue and fire fighting, fuel storage, and air traffic control. The work completed in Phase 1 has identified land areas on the Airport that should be preserved for such uses in the future and the findings are discussed in more detail in Section 7.

![Figure 3-2: Demand for Existing Terminal Area Parking](image)

**Figure 3-2: Demand for Existing Terminal Area Parking**

4 FINANCIAL CONSIDERATIONS

The capacity to fund projects intended to accommodate the aviation activity forecast in a long-term master plan is an unavoidable constraint on an airport operator when evaluating development options. All major airports in the United States, including FLL, are self-financing. That is, monies used to fund capital projects are directly supported by user fees, rents, charges, and other revenues of the airport or airport system. General local taxes do not directly support projects at large airports, which is the case at FLL also. As large airports do not rely on any local secondary source to support project financing, and given that such projects most often are intended to accommodate forecast activity (rather than existing activity), the capacity to finance projects is somewhat constrained, and financial planning is essential.

This section presents an overview of the sources of funding generally available to airport operators when developing a financial plan for capital projects, presents a review of the County’s capacity to finance future capital projects at FLL, outlines the financial implications of completing projects treated as “givens” in the FLL Master Plan Update process, outlines key factors affecting project cost and financing to be considered by the County in reviewing Phase 1 of the Master Plan Update process, and discusses airline rate-making considerations. This section is intended to inform stakeholders involved in the Phase 2 outreach process and to provide a basis for decision-making by the County.

4.1 OVERVIEW OF AIRPORT CAPITAL FUNDING

Airports are capital-intensive facilities and airport operators rely on a wide variety of diverse sources to finance capital projects, including:

- **Airport Revenue Bonds** — Among large airports in the United States, bond proceeds account for considerably more than 50% of the funds used to construct capital projects. These bonds are, in most cases, secured by airport revenues. Under some negotiated airline agreements, including the one in effect at FLL, airline tenants at the airport must approve, among other things, the issuance of general airport revenue bonds, in part because the debt service on such bonds may affect future airline rates.
- **Passenger Facility Charges (PFCs)** — PFCs are Congressionally authorized local user fees that may be used only to fund eligible capital projects. PFCs are collected by the airlines on behalf of an airport operator in conjunction with the airline ticket sale, and PFC revenues are remitted directly to the airport operator less an airline fee for administration. PFC revenues may be used to fund projects on a pay-as-you-go basis or to support financing by paying debt service on bonds and other debt instruments.
- **Federal Grants** — Airport operators annually receive formula-based grant funds through the FAA’s Airport Improvement Program (AIP). Formulas for determining the amount of AIP entitlement grants are based on numbers of enplaned passengers and cargo weight. Airport operators may also apply to the FAA for additional discretionary AIP grants to fund eligible capital projects. In general, the larger the airport, the smaller the role of AIP grants in funding a capital program. For example, AIP grants have historically financed less than 5% of FLL’s capital spending. Since 2002, grants are also available on a very limited basis from the Transportation Security Administration (TSA) for security-related capital projects at airports.
- **State Grants** — The State of Florida is unique in that it provides (1) grants through its Department of Transportation (FDOT) and (2) State Infrastructure Bank (SIB) loans to airport operators for eligible capital projects. The County has received both types of assistance from the State to help fund projects at FLL.
- **Available Airport Funds** — Airport operators generate revenues from various airline and nonairline sources, which, after paying operating and debt service costs, may be retained and invested in capital projects, depending on the terms of the airline agreements, if any, and agreements with bondholders.

4.2 CAPACITY TO FINANCE FUTURE CAPITAL PROJECTS AT FLL

The core drivers of the County’s ability to afford future capital projects include:

- **FLL’s existing cost structure and levels of outstanding debt.**
- **Additional costs and outstanding debt once the Master Plan Update’s “given” projects are completed.**
- **The cost, scale, and timing of future capital projects.**
- **The County’s willingness to charge user fees that reflect the capital and operating costs of the Airport’s facilities, and user acceptance of such fees.**
- **The potential for realizing increased PFCs, either through increased passenger numbers or from a potential increase in the federally imposed cap on the PFC rate.** (While an increase in the PFC rate above $4.50 is under discussion throughout the aviation industry, no such increase in the PFC rate was assumed in the financial analysis. An increase in the rate is not under the County’s control, but requires Congressional action for airports nationwide.)
- **Ability to secure grants.**
- **The County’s capacity to bond finance the capital program based on forecast growth.**

4.2.1 Current Financial Performance and Future Targets

To assess the County’s capacity to finance the alternative terminal development programs discussed in Section 6, it is necessary to make certain assumptions about the financial performance measures the County might use to compare performance. Two primary metrics were used in our assessments: airline cost per enplaned passenger and annual debt levels.
As shown on Figure 4-1, airline costs per enplaned passenger among large-hub airports fall into three categories: (1) airports at or below the median, (2) airports between the median and the 75th percentile, and (3) airports above the 75th percentile. For purposes of this analysis, it was assumed that the County would want to limit the CPE at FLL to the 75th percentile or lower compared to other large-hub airports.

**Airport Debt Levels** - FLL also has lower debt levels than other large-hub airports, as measured by the amount of outstanding principal on bonds (not annual debt service) per enplaned passenger. While the median level of outstanding debt per enplaned passenger (DPE) at large-hub airports is about $93, and the 75th percentile is about $138, FLL’s DPE in 2004 was $77. (FLL is closer to the median in DPE than CPE because the County has issued PFC debt, which is not reflected in DPE but not CPE.) DPE is taken into account by credit rating agencies, bond insurers, and potential investors.

As shown on Figure 4-2, airport debt per enplaned passenger is more evenly distributed across a range among large-hub airports than CPE. For purposes of this analysis, it was assumed that the County would also want to limit DPE at FLL to no more than the 75th percentile compared to other large-hub airports.

These metrics show where FLL falls relative to (1) large-hub airports that are "route partners" with FLL, such as the New York airports, where many passengers begin and end their FLL trips, (2) other Florida airports, which share similar market characteristics as Sun Belt destinations, and (3) competing South Florida airports within driving distance of FLL. No absolute benchmark exists for airport financial capacity or for determining affordability. However, the above figures represent the upper limits of the affordability range, which generally occurs at the 75th percentile.
percentile of the CPE index. Only certain airports with unique characteristics operate above this "soft ceiling" largely because of unique circumstances; for example, two of the three large-hub New York airports and the airports serving Cleveland, Denver, and San Francisco. CPE and DPE at the 75th percentile for large-hub airports do not represent a target for results, and should not be interpreted as acceptable to airport users, particularly airlines. In general, airline concerns about cost will increase significantly as an airport's development increases from baseline levels, exceeds the industry medians, or approaches this "soft ceiling." User views of increased costs will also be affected by the utility and efficiency of the development program presented by the airport operator. Therefore, a standardized upper limit at the 75th percentile for CPE and DPE is a financial planning and comparative tool for stakeholders and the Board to use in evaluating development options that have varied efficiencies, financial capacities, and user benefits.

If in the future, after the "given" and recommended projects emerging from the Master Plan Update process are completed, FLL's costs were to be somewhere between the median and the 75th percentile in terms of CPE, FLL would be in the same range as the following airports:

- Boston-Logan International Airport
- Detroit Metropolitan Wayne County Airport
- Bush Intercontinental Airport-Houston
- Los Angeles International Airport
- LaGuardia Airport
- Philadelphia International Airport
- Pittsburgh International Airport
- Lambert-St. Louis International Airport
- Luis Munoz International Airport (San Juan)
- Seattle-Tacoma International Airport

4.2.2 Financial Planning Approach

A key step in developing the financial plan for Phase 1 of the Master Plan Update is to resolve the tension between new facility requirements and financial performance and cost management targets. To accomplish this, facility timing and sequencing were reviewed, as were innovative financing options. A financial forecasting model through 2020 was also created to evaluate numerous scenarios for development at FLL, and to ensure that facilities are developed to optimize financial capacity and funded in such a way as to manage FLL's cost structure and minimize airline costs as much as possible.

4.3 FLL'S FINANCIAL BASELINE AFTER "GIVEN" PROJECTS ARE COMPLETED

FLL is nearing a point at which some of the factors that have kept costs and debt levels fairly low historically will no longer be in play. After completing the "given" projects (the Proposed South Runway Extension, noise mitigation, Concourse A, Group Check-in, and double-decking of the exit roads) and investing in any deferred capital maintenance needs, FLL's cost structure and debt levels are projected to approximate the medians at large-hub airports.

- New Baseline Cost Levels — After the "given" projects are completed and investments have been made for required capital maintenance, FLL's CPE is projected to be in the $8 range in 2011 (in future year dollars), placing FLL in the middle of the range compared to other large-hub airports (see Figure 4-3). If the County adopts CPE targets at or below the 75th percentile among large-hub airports, CPE is projected to be the primary limiting factor on future financial capacity and, potentially, development of FLL.

- New Baseline Debt Levels — After the "given" projects are completed, FLL's DPE is projected to peak at $93 in 2011, which is roughly equal to the median for large-hub airports (see Figure 4-4). Thereafter, and not including additional future investments, DPE at FLL would decline compared to the median, as principal is paid and passenger traffic grows. DPE targets are not expected to be the limiting factor on future financial capacity or development at FLL.

The recent period of construction and financing of capital projects means there is less leeway in terms of CPE and DPE than previously. Managing the limited remaining financial capacity will entail making tradeoffs among projects and/or delaying projects until greater financial capacity is restored.
4.4 FACTORS AFFECTING COST AND FINANCING OF CAPITAL PROJECTS TO ACCOMMODATE FORECAST GROWTH

As the County moves forward with projects intended to accommodate forecast traffic growth through 2020, FLL will experience more complex and costly construction phasing, as is the case at most other large-hub airports. The factors affecting changes in the development environment include:

- **Construction in Developed Areas** – After completion of Concourse A, construction of additional terminal space will require (1) demolition of portions of existing terminal facilities and/or (2) construction in secure airside areas, both of which will increase costs. Because of the need to demolish and replace existing facilities in the future, new projects will result in less “net gain” in facility capacity for a given amount of capital expenditure.

- **Conversion of PFC Bonds** – The use of PFC revenues to pay debt service on certain existing bonds will “convert” to the use of conventional Airport revenues in Fiscal Year 2012, creating additional PFC capacity to support new projects. However, this conversion will also increase the level of debt in the airline rate base and, therefore, will increase CPI after 2012.

- **Investment in Capital Maintenance** – The County will increasingly need to invest in maintenance of existing capital assets, which are increasing in number and age. For purposes of this analysis, it was assumed that capital maintenance would be paid from the Renewal and Replacement Account, which is, in part, funded from airline rates and charges. Based on estimates of the funding necessary to maintain the asset base, this investment is estimated to add approximately $1.50 to FLL’s CPI each year.

- **Limited PFC Capacity** – Revenues from the PFC, which is currently limited by federal legislation to $4.50 per passenger, are largely committed through 2011. For purposes of this analysis and consistent with the County’s well-managed, historical use of PFC revenues, such revenues were assumed to be used in the following order of priority:
  - Noise Mitigation – $1.50 of each $4.50 PFC is assumed to be (1) dedicated to noise mitigation and (2) sufficient to pay for noise mitigation into the future. If necessary, these revenues can be leveraged by issuing bonds to increase the amount of funding available in the early years.
  - Existing Debt – The remaining $3.00 of each PFC is largely committed through 2012 to the payment of debt service on bonds and the repayment of a State Infrastructure Bank loan.
  - Terminal Facilities – The historical and current practice of using PFC revenues to pay debt service on bonds used to fund terminal projects is assumed to continue, with PFCs paying 30% to 40% of new terminal debt service.
  - Roadways and Access – PFC revenues are assumed to be used to pay 75% of debt service on the Group Check-in facilities intended to relieve roadway and terminal congestion through Fiscal Year 2012. While debt service on the roadway projects, such as the Terminal 3 roadway improvements and proposed people mover projects, would be PFC-eligible, PFC capacity is not projected to be available through 2020. Debt service on these projects is assumed to be paid from Airport revenues.
  - Airfield Facilities – PFC revenues were not assumed to be available to pay debt service on bonds used to fund new runways and associated airfield facilities, given competing projects and the fact that the funding fee is the most efficient source of funding for airfield improvements. Airfield improvements are also assumed to be funded in part with $200 million in FAA AIP grants over 10 years pursuant to a Letter of Intent (LOI).

The financial implications associated with the optional future capital projects at FLL are discussed in detail in Section 6.

4.5 AIRLINE RATE-MAKING CONSIDERATIONS

The County entered into long-term Airline-Airport Lease and Use Agreements (Airline Agreements) with 14 airlines currently serving the Airport (the Signatory Airlines). These agreements are scheduled to expire in 2011. The Airline Agreements define:

- Terms for use of the Airport and its facilities.
- Leasing of exclusive and noneexclusive space.
- Airline majority-in-interest (MII) approval of (1) certain capital expenditures and (2) issuance of bonds for which debt service is to be included in the airline rate base.
- Terms for maintaining and operating the Airport.
- A "residual" methodology for setting airline rates and charges each year, which credits revenues from various nonairline sources, such as parking, rental cars, terminal concessions, and land rentals, to abate the fees paid by the airlines. BCAD, therefore, recovers from airline fees and charges the net amount necessary for the Airport to break even annually, retaining limited deposits to capital funds.

The amount of earnings retained each year that can be used at the County’s discretion without MII approval, which currently ranges from $5 million to $6 million annually, and is a fairly limited amount compared to that available to most other airport operators.

When the current Airline Agreements expire in 2011, the County will need to decide what form of airline agreement, if any, and rate-making methodology it wants to implement. The County’s business relationship and rate-making methodology will be a function of several key policy decisions, including but not limited to:

- Whether or Not to Adopt a New Airline Agreement – It was assumed in this analysis that a new airline agreement will be executed.
- Control of Capital Program and Operation – A number of capital projects proposed for 2012 through 2020 may or may not have airline support. For the purpose of this analysis, it is assumed that, after 2012, the County will reserve its right to make decisions regarding capital investments and operating costs.

- **Airline Costs** – The County will need to decide whether it prefers to (1) minimize increases in airline costs while proceeding with the identified capital projects by crediting nonairline net earnings to abate airline rates and charges, or (2) retain net earnings to be invested as equity in capital projects, as discussed below. It was assumed in this analysis that controlling airline costs will take priority over accumulating equity for projects.

- **Managing Debt Levels** – The County may need to establish an acceptable level of debt for FLL, and this may be a more conservative amount than the level established by other airport operators. If so, the County may prefer to retain nonairline revenues and invest them as equity in capital projects.

It was assumed in this analysis that the current residual rate-making methodology is the default methodology for the future, based on existing practice and current County goals of maintaining low airline rates. Other rate-making methodologies that would serve various objectives were also evaluated, most of which would increase airline costs significantly in the years after 2011, when such a change in methodology would be permitted.

4.6 SUMMARY OF KEY FINDINGS

The key findings of this financial assessment include the following:

1. The County has the capacity to finance facility development to accommodate forecast air traffic growth because FLL currently has lower than average costs and does not have undue debt levels.

2. The extent of FLL’s financing capacity is primarily a function of the County’s policies regarding airline costs. If the County departs from the historical goal of maintaining airline costs that are among the lowest in the industry for large-hub airports, financing capacity will increase. Departure from historical cost minimization goals may be reasonable in the context of high demand for FLL access and facilities.

3. The County has been able to maintain lower CPEs in the past 10 years because of greater than forecast airline traffic growth, and the development of new facilities with capital costs and funding that have been well-managed. To manage user costs in the future, the County will need to (a) be concerned about sustaining high-cost capital projects that deliver marginal net capacity, (b) recognize that most new projects cannot be developed in “green field” sites and, therefore, are likely to be more expensive, (c) define “expandable” projects that can be developed in a demand-responsive sequence, and (d) minimize the extent to which projects require a large front-loaded investment that
4. The completion of projects established as “givens” for the Master Plan Update, including the Proposed South Runway Extension, as defined by the County to date, will increase airline costs, with the CPE projected to be in the “median” range for large-hub airports. After completion of these “given” projects, the capacity to fund additional projects will be reduced unless actual traffic materially exceeds the forecasts.

5. A number of factors could positively affect the affordability of new capital projects above the baseline assumptions, including the potential for exceeding the traffic forecasts, an increase in the PFC level, increased nonairline revenue, and managing growth in operation and maintenance expenses.

6. In Phase 2 of the FLL Master Plan Update process, the County will need to decide how to balance airline costs and FLL debt levels with the level of service provided to passengers following the development of new facilities.
5 AIRFIELD DEVELOPMENT, LAND USE ISSUES, AND OPPORTUNITIES

The Airport currently has three distinct land use activity zones, designated on Figure 5-1 as the Terminal Area, the North Side, and the West Side. The Terminal Area contains various passenger-related facilities, including access roads, vehicle parking structures, terminal buildings, and airline aircraft gates. The North Side and West Side zones provide for a variety of aviation-related activities and support functions, including fixed base operator (FBO) facilities and general aviation (GA) operations, aircraft maintenance, air cargo facilities, vehicle parking, and fuel storage. The dimensions of these zones are shaped by the existing layout of the three runways at the Airport. In the future, the preferred runway alternative that emerges from the FAA’s South Runway EIS process, along with any related policies that may be adopted by the Board, will shape the size and types of development opportunities within each zone.

To provide background information for the discussion of facility plans in subsequent sections of this summary report, this section provides a review of the development opportunities and constraints associated with various runway alternatives being considered in the FAA’s EIS process.
5.1 SOUTH RUNWAY ALTERNATIVES

In the motion adopted by the Board on December 9, 2003, the extension of Runway 9R-27L was designated as the County’s “Preferred Alternative” for future airfield development. In January 2006, the FAA identified two additional South Runway alternatives that entail shifting the centerline of the South Runway just over 300 feet to the north or to the south of its current location. The features and land use implications of each alternative to the County’s Proposed South Runway Extension are as follows.

5.1.1 South Runway Extension (EIS Alternative B1)

In this alternative, the South Runway would be extended to the east out to NE 7th Avenue at length of about 8,600 feet and at an elevation necessary to provide the required clearances over the Florida East Coast Railroad right-of-way and US 1, as shown in Figure 5-2. The retaining wall and taxiway necessary to support the construction and operation of the proposed elevated extension of the runway would impose some limits on potential terminal and aircraft apron development in the vicinity of existing Terminal 4.

The dual taxiway system proposed at the west end of the extended North Runway, Runway 9L-27R, would similarly constrain development opportunities along the southern boundary of the West Side zone.

A narrow area on the southern edge of the existing airfield would be available for limited uses, such as surface parking for automobiles.

5.1.2 South Runway EIS Alternative B4

In this alternative, the South Runway would be shifted about 340 feet to the north of the existing runway centerline and would be constructed at a length of about 6,000 feet, mostly within the existing Airport boundary, except for a slight required shifting of the Florida East Coast Railroad tracks, as shown on Figure 5-3.

This alternative would significantly reduce the land area available for development south of existing Terminal 4 and, therefore, would constrain the ability of this area to accommodate the currently proposed plan for a new International Gateway Project at the Terminal 4 site.

Shifting the South Runway northward would similarly and materially reduce the area available for aviation-related
development on the West Side. However, this alternative would make available about a 65-acre area on the South Side of the Airport that would be well suited for the development of general aviation facilities, such as terminals and aircraft parking areas, and would likely increase the area available on the West Side for support facilities other than those for general aviation operations.

5.1.3 South Runway EIS Alternative B5

In this alternative, the existing South Runway would be extended and elevated over the Florida East Coast Railroad tracks and US 1, similar to EIS Alternative B1, but the location of the Alternative B5 South Runway would be shifted about 300 feet southward of the existing South Runway centerline, as shown on Figure 5-4.

This alternative would add some limited land area south of existing Terminal 4 and the West Side development zone. This newly available land area could be used for aircraft apron and maneuvering, but would, among other things, preclude potential development opportunities on the South Side.

5.2 Crosswind Runway Alternatives

Defining actions to date related to alternatives for crosswind Runway 13-31 are as follows:

- In its motion adopted on December 9, 2003, the Board requested that options for shortening and/or decommissioning the Crosswind Runway be evaluated as part of the Master Plan Update process.
- Subsequently, in October 2004, the Board adopted the County Objective Statement, which includes a stated goal of decommissioning the Crosswind Runway.
- In January 2006, the FAA indicated that decommissioning of the Crosswind Runway is included in all but one of the runway alternatives being evaluated in the Proposed South Runway Extension EIS. Retention of the Crosswind Runway (as in the No Action alternative and in Alternative B4) would limit the potential terminal development opportunities at the Airport and, as the issue is unresolved, it directly affected the available options for development evaluated in Phase 1 of the Master Plan Update.

In accordance with the Board’s December 9, 2003, motion cited above, options for the Crosswind Runway were evaluated in Phase 1 and the key findings and land use implications from this evaluation are as follows:

- The Crosswind Runway is about 6,900 feet long and intersects both the north and south parallel runways. Given the elevation of the Proposed South Runway Extension, it would not be practical to preserve the Crosswind Runway at its current length and, at best, the runway could be maintained at a length of 4,000 feet to 4,500 feet.
- Decommissioning the Crosswind Runway would allow an additional 50 acres for terminal area development and an additional 20 acres on the West Side for support facility development.
- In the near-term, pending the outcome of the FAA’s Proposed South Runway EIS process, it is advisable to proceed with planning for the phased development of the passenger terminal complex both with and without the Crosswind Runway.

- The capacity benefits provided by a shortened Crosswind Runway would be negligible, given that it would still intersect the North Runway and could use by only a limited portion of the aircraft fleet serving FLL. Further, a shortened Crosswind Runway would provide less than 1% additional coverage based on the prevailing wind conditions and the FLL fleet mix, which would not justify retaining this runway, particularly when evaluated in the context of land use criteria and land availability.

5.3 New North Parallel Runway Alternative

This alternative would involve the construction a new parallel air carrier runway between existing north Runway 9L-27R and I-595, as shown on Figure 5-5. Defining actions to date related to the new north parallel runway alternative are as follows:
In its motion adopted on December 9, 2003, the Board requested that the advisability of preserving the option to construct a north parallel runway in the future be examined as part of the Master Plan Update process.

In January 2006, the FAA indicated that three alternatives being considered in the Proposed South Runway Extension EIS provide for a potential north parallel runway. Under EIS Alternative C1 (as shown in Figure 5-5), the runway would be constructed as an alternative to extending the South Runway, and under Alternatives D1 (as shown on Figure 5-6) and D2, the north parallel runway would be constructed in combination with an improved South Runway.

In accordance with the Board's motion cited above, the advantages and disadvantages of preserving the option for a future north parallel runway were evaluated in Phase 1 of the Master Plan Update process, and the findings are as follows:

- To facilitate construction of the north parallel runway, a number of existing buildings and the fuel farm along the northern border of the Airport would have to be demolished. About 80% of the existing facilities in the North Side zone of the Airport could be accommodated elsewhere on the Airport, principally in the West Side zone.

- In the near-term, it is advisable to preserve the option for a future north parallel runway and limit the terms of lease agreements with tenants on the North Side, at least until the Proposed South Runway Extension EIS process is completed and all alternatives are fairly assessed. Further, areas should be reserved in the West Side zone to accommodate the potential relocation of functions from the North Side zone to facilitate the future development of a north parallel runway.

- In the long-term, even if one of the South Runway alternatives were implemented as proposed, preserving the option for a new north parallel runway would give the County the means to provide incremental airfield capacity to accommodate aviation demand post-2020, as contemplated under Alternatives D1 and D2 in the Proposed South Runway Extension EIS.
6 TERMINAL DEVELOPMENT OPTIONS

The passenger terminal complex at FLL is in transition as new and/or upgraded terminal, roadway, and parking facilities have come online over the last 10 years. Additionally, several new projects are currently in the planning stages (Concourse A/Group Check-in Facility, Terminal 4 International Gateway Project, etc.).

Looking forward, terminal development options have been defined in the Master Plan Update - Phase 1 for two time horizons, as discussed below.

- One category, referred to as “additive options,” would provide for facilities to accommodate forecast demand over a short-term (10 to 15 year) timeframe.
- The second category, referred to as “redevelopment options” would provide facilities to accommodate demand in the short-term timeframe, but would also preserve options for follow-on longer-term development to accommodate demand beyond 2020.

Overall, the short-term options outlined in this section could be developed with crosswind Runway 13-31 in place, but the long-term options would require that this runway be decommissioned.

6.1 EXISTING CONDITIONS

6.1.1 Terminals

The existing terminal complex at FLL consists of four terminal buildings with 57 air carrier aircraft gates and a double-decked roadway serving the terminals, as shown on Figure 6-1. The terminals include:

- Terminal 1 (T1), comprising Concourses B (9 gates) and C (9 gates).
- Terminal 2 (T2), comprising Concourse D (9 gates).
- Terminal 3 (T3), comprising Concourses E (10 gates) and F (10 gates).
- Terminal 4 (T4), comprising Concourse H (10 gates), which serves as the international terminal.
6.1.2 Parking

The terminals are supplemented by three parking garages. The parking garages from west to east include:

- The Palm Garage, comprising approximately 2,700 structured parking spaces on three levels.
- The Hibiscus Garage, comprising approximately 4,800 structured parking spaces on five levels.
- The Cypress Garage, comprising eight levels, and approximately 4,400 structured parking spaces on the top four levels, and the consolidated rental car facilities on the first four levels.

6.1.3 Roadway System

Access to the terminal complex is provided from US 1 and I-595 on the east side via a newly constructed interchange system. The roadway system is a double-decked five-lane roadway, except at T1 where there is an extra lane. There is a significant level difference at the upper level roadway between T1 and T2, which corresponds to the floor heights at these terminals.

Additionally, the turns at T3 are very tight and require significant slowing down. After T4, all traffic merges onto a single level, three-lane roadway system, resulting in congestion at peak periods. Crosswalks are provided at the terminals at both levels.

6.2 ISSUES AND OPPORTUNITIES

Key issues and opportunities in the terminal complex (airside and landside) are outlined on Figure 6-2 and discussed below.

6.2.1 Issues

- **Airside impacts** on taxiways and taxilanes caused by aircraft pushback from gates. The existing terminal configuration is not very conducive to aircraft circulation. Single taxilanes between piers cause congestion at peak periods. Additionally, aircraft at Concourses B, C, and D push back onto an active taxiway, causing congestion during periods of west flow (when Runway 27R is used for arrivals and departures).

- **Terminal 4 configuration impacts** on short-term demand and compatibility with the ongoing EIS. The planned configuration of T4 is not compatible with all
of the EIS alternatives. Depending on the preferred alternative at the end of the EIS process, the configuration of T4 may have to be reevaluated.

- **Roadway impacts** to the terminal area and curbside relative to short- and long-term demand. The existing roadway system, while adequate to meet short- and medium-term demand, is unlikely to meet long-term demand.

- **Terminal improvements** will likely be achieved through improved technology in passenger and baggage screening. Although improvements in technology are likely to improve efficiency at the terminals, additional upgrades to T2, T3, and T4 are needed in the long-term.

### 6.2.2 Opportunities

- **Expansion opportunities** are likely to be provided if crosswind Runway 13-31 is decommissioned. The decommissioning of Runway 13-31 will free up approximately 50 acres of land for terminal development to the west of the existing terminal complex.

- **Terminal area parking** demand based on historical and forecast needs. The existing parking garages at FLL are very well located relative to industry standards, with relatively short walking distances to the terminal buildings. Demand analysis indicates a need for additional parking in the short and long terms. The site for the intermodal center in the entrance roadway helix and the Palm Garage, which can be redeveloped, are both opportunity sites. Redevelopment of the Palm Garage also offers an opportunity to redesign the roadway near T3 and improve traffic flow.

### 6.3 OVERVIEW OF DEVELOPMENT OPTIONS

Over the course of Master Plan Update – Phase 1, multiple short- and long-term terminal development options were evaluated based on the following criteria:

- **Airside elements / impacts**
- **Landside elements / impacts**
- **Walking distances**
- **Parking**
- **Curbside**

#### ADDITIVE DEVELOPMENT

**OPTION 1A**
- Includes proposed Concourse A, T4 International Gateway Project, and extensions to Concourses E and F. Option 1A would be more expensive in the initial phases than Option 1B, and would meet short-term growth needs for the next 10-15 years, but preclude options for growth beyond that period. Option 1A would have lowered airside and landside levels-of-service. This option would not be compatible with EIS Alternative B4 in the long-term.

**OPTION 1B**
- Includes proposed Concourse A, T4 narrowbody project, and extensions to Concourses E and F. Option 1B would be less expensive than Option 1A, and meet short-term growth needs for the next 10-15 years, but preclude options for growth beyond that period. Option 1B would have lowered airside and landside levels-of-service. This option would not be compatible with EIS Alternative B4 in the long-term.

#### REDEVELOPMENT

**OPTION 2A**
- Includes proposed Concourse A, T4 International Gateway Project, significant alterations to Terminals 2 and 3, including a satellite to meet long-term gate demand, as well as reconfigured parking and roadways. Option 2B assumes widebody/international traffic would use the Terminal 3 satellite. Option 2B would be less expensive than Option 2A. This option would not be compatible with EIS Alternative B4 in the long-term.

**OPTION 2B**
- Includes proposed Concourse A, T4 narrowbody project, significant alterations to Terminals 2 and 3, including a satellite to meet long-term gate demand, as well as reconfigured parking and roadways. Option 2B assumes widebody/international traffic would use the Terminal 3 satellite. Option 2B would be less expensive than Option 2A. This option would not be compatible with EIS Alternative B4 in the long-term.

**OPTION 2C**
- Includes proposed Concourse A, T4 narrowbody project, significant alterations to Terminals 2 and 3 with a central passenger processor, as well as reconfigured parking and roadways. Option 2C is likely to be more expensive than Option 2B. This option would not be compatible with EIS Alternative B4 in the long-term.

The key features of each of these alternatives are described in greater detail on the following pages.
6.4 DEVELOPMENT OPTION 1A

The primary features of Option 1A are:

- Proposed widebody T4 International Gateway Project and Concourse A in the short term.
- Extensions to Concourses E and F to meet short- and medium-term demand with minimum capital investment.
- Landside development limited to the roadway improvements currently planned as part of the T4 International Gateway Project and other circulation improvements, including the pedestrian walkway and exit roadway improvements.
- Additional terminal area parking provided at intermodal center site within the roadway interchange, supplemented by interim remote surface parking on the West Side of the Airport.
- No investment in roadway and parking improvements within the terminal complex.
- Further, the ability to expand the terminal complex beyond the 10-15 year demand level would be limited; therefore, the plans indicate no long-term expansion options.

Development Option 1A is shown on Figure 6-8 and described on the following pages.

**OPTION 1A FEATURES INCLUDE:**

- Incremental development of up to 79 gates.
- Proposed widebody T4 International Gateway Project and Concourse A.
- Near-term capacity relief.
- Lowered level-of-service in terminal area.
- Airside implications due to aircraft pushback into taxi areas.
- More expensive than Option 1B.
- Short-term development would not be compatible with EIS Alternatives B4 and D2.

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**DEVELOPMENT OPTION 1A**

- 79 air carrier aircraft gates
- 17,000 structured parking stalls

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**Figure 6-8 DEVELOPMENT OPTION 1A**

![Diagram showing Development Option 1A features and impacts](chart.png)
6.4.1 Description

Terminal Development Option 1A is based on the premise that terminal development at the Airport would proceed with minimum capital expenditure. The fundamental goals of this option are to:

- Move forward with the T4 International Gateway Project and Concourse A as currently planned.
- Provide short- to medium-term capacity to meet demand.

Terminal 1 – Concourse A would be developed as planned with five additional gates in Option 1A. This addition would likely relieve capacity constraints in the short-term. Concourses B and C would continue to be used as they are currently.

Terminal 2 – There would be no changes to Terminal 2 in Option 1A.

Terminal 3 – Option 1A envisages extensions to Concourses E and F and minor modifications to passenger processing and baggage screening areas of T3 to accommodate increased demand and added gates.

Concourse E would be extended to add four new gates with a concessions/retail node at the end of the concourse. Concourse F would be extended to add five new gates with a concessions/retail node at the end of the concourse. As a result of the extensions, short- to medium-term demand would be met with limited capital investment. However, the configuration would likely increase the possibility of airside congestion due to increased dependency of aircraft on a single taxilane between Concourses E and F.

Terminal 4 – The T4 International Gateway Project would proceed as currently planned in Option 1A. The initial phase of this expansion would add 10 new gates to the east of Concourse H. However, this would likely result in the loss of four existing gates. In the following phase of development, a further nine gates would be added to the west of Concourse H. Additionally, Concourse H would also be demolished in this phase. This development program would eventually increase the gate capacity at T4 from the existing 10 gates to 19 air carrier and 3 commuter gates.

Terminal Area Parking – Option 1A provides for approximately 5,000 new structured parking spaces to be developed at the site of the intermodal center at the entrance to the Airport.

Roadways and Curbside – Option 1A includes roadway improvements that would form part of the T4 International Gateway Project. These improvements would increase capacity near T4 in the short- to medium-term. However, anticipated roadway congestion near T2 and T3 would not be resolved.

6.4.2 Phasing

It was assumed in the phasing scenarios on Figure 6-9 that the first phase of the T4 International Gateway Project and the development of Concourse A would proceed in Phase 1. The second phase of the T4 International Gateway Project and development of the parking structure at the intermodal center site would occur in Phase 2. Incremental gate/concourse additions to Terminal 3 would occur in Phases 2 and 3.
6.4.3 Operational Advantages and Disadvantages

The main advantages of Option 1A would be:

- Short-term domestic capacity benefits from implementation of Concourse A.
- Short-term international capacity benefits from implementation of the T4 International Gateway Project.
- The provision of a Gateway Terminal for Broward County.

The main disadvantages of Option 1A would be:

- Limited potential for follow-on long-term development for the terminal complex due to the proposed configuration of T3.
- Current plan for the T4 International Gateway Project incompatible with the South Runway included in EIS Alternatives B4 and D2.
- Longer lead time for additional gate capacity due to projected timetable to complete gateway project.
- Poor airside access for aircraft taxiing to and from interior gates on Concourses E and F due to single taxi lane.
- Relatively modest improvements in passenger processing capabilities at T3.
- Low service levels for terminal roadway and parking due to the lack of added capacity within the terminal area.

6.4.4 Air Carrier Gate Capacity

Air carrier gate capacity and demand associated with Option 1A are shown on Figure 6-10. Figure 6-10 shows the relationship between the number of air carrier gates and the use of gates (measured in average turns per gate, where a turn is equal to one arrival + one departure). This relationship is also measured against historical and forecast numbers of enplaned passengers to show areas of over-capacity or capacity shortfall.

As shown, short- to medium-term gate demand would be met with the implementation of Concourse A and the T4 International Gateway Project as planned. While it is possible that the Concourse E and F extensions would accommodate demand through the medium-term, long-term growth options would be limited and the option to expand the terminal complex beyond 79 gates is compromised.

6.4.5 Terminal Area Parking Capacity

Terminal area parking capacity and demand associated with Option 1A are shown on Figure 6-11. Figure 6-11 shows the relationship between terminal area parking spaces and use of these spaces as measured against numbers of enplaned passengers to show areas of over-capacity or capacity shortfall.

As shown, short-term parking demand would be met with the implementation of the Cypress Garage. To accommodate demand midway through the planning period, additional terminal area parking capacity would be developed at the intermodal center site, supplemented by remote surface parking on the West Side of the Airport on an interim basis.

While the exact timing of the intermodal center parking is unknown, by the time this project is implemented and additional terminal area parking spaces are available, there is likely to be a shortfall in terminal area parking capacity with respect to forecast traffic.
6.4.6 Financial Analysis

The preliminary financial highlights for this development option, prior to Master Plan Update – Phase 2 refinements and stakeholder inputs, include:

**Program Phasing** – The following near-term projects (shown on Figure 6-12) were assumed to be completed in the same timeframe under all five of the terminal development options presented in this section:
- Planning, permitting, and design of the airfield development alternative would continue through 2008, and construction would be completed by 2011.
- A new ARFF facility would also be completed by 2011 to serve the airfield development alternative.
- The County’s Residential Noise Mitigation Program would begin in 2007, and PFC revenues generated through the incremental $1.50 PFC would be committed to the program through the forecast period.
- Concourse A and the associated Group Check-in Facility would be completed by 2010.
- The phasing of these near-term projects and additional projects under Option 1A was structured to provide gate capacity as soon as possible while maintaining CPE levels at those projected for the 75th percentile for other large-hub airports.
- The eastern and larger segment of the T4 International Gateway Project was assumed to be completed by 2013. After the significant investment in the eastern T4 International Gateway Project, limited financial capacity was projected to be available for other terminal development for the County to remain at or below the 75th percentile relative to other large-hub airports in terms of CPE.
- To provide low-cost gate capacity, the Concourse E and F extensions were assumed to be completed between 2016 and 2018. The western T4 International Gateway Project was assumed to be completed in 2020.
- Parking requirements associated with the eastern T4 International Gateway Project were assumed to be met by constructing inexpensive, interim surface parking on the West Side of FLL, which would require less investment than structured parking.

**Financial Effects** – Option 1A is estimated to have the third highest capital cost of the five options through 2020. The program could be financed, but not without significant increases in the CPE and DPE relative to (1) current levels, (2) projected levels after completing the “given” projects, and (3) the median of other large-hub airports. The magnitude of the capital investments required for the eastern segment of the T4 International Gateway Project would significantly limit the County’s project phasing options if CPE and DPE are to remain at or below the 75th percentile relative to other large-hub airports.

**Cost per Enplaned Passenger (CPE)** – Under Option 1A, CPE would increase to approximately $13.00 in 2012 and escalate approximately 2% annually thereafter; these levels closely track projections of the large-hub airport 75th percentile.

**Use of PFC Revenues** – Consistent with the priority for application of PFC revenues outlined in Section 4, $1.50 of each $4.50 PFC would be committed to pay for noise mitigation programs. All remaining PFC revenues after 2012 are assumed to be used to offset terminal development costs through 2020.

**Debt per Enplaned Passenger (DPE)** – DPE would increase to about $120 in 2012, above the median but below the 75th percentile relative to other large-hub airports. DPE would then gradually decrease to about $100 by 2020 as debt is amortized and the number of enplaned passengers increases.

**Development Risks** – This option entails the following development risks:
- **Flexibility to Match Development with Demand** – Option 1A involves constructing the eastern T4 International Gateway Project by 2013. The significant short-term capital investments envisioned would limit the County’s subsequent ability to respond to future Airport improvement needs, both planned and unplanned.
- **Project Interdependencies** – The projects envisioned under this option could be constructed fairly independently of one another. Failure to complete one of the projects would not likely jeopardize other facilities.
- **Amount of Concurrent Development** – Under this option, there would be six large capital projects under construction concurrently at the peak of construction, which may be a challenge in terms of obtaining labor, providing construction staging areas, and possible cost of materials.
- **Degree of Front-loading of Capital Costs** – Approximately 70% of the capital costs under this option would be incurred through 2014, i.e., halfway through the period to 2020. Option 1A would entail significant financial capacity up front to finance large international facilities, resulting in terminal facility costs on a per gate basis that exceed those for narrowbody facilities, and in advance of when international service is forecast to warrant such facilities in the FAA TMO. These investments would create financial inefficiencies, including a significant debt and operating cost burden to the airlines, and ultimately the County. Subsequent investments in terminal and parking facilities could be made in smaller increments, sized to meet demand as it materializes.
- **Demolition of Existing Facilities** – The only structured facility to be demolished under Option 1A would be the existing T4, which would help minimize costs of demolition.
- **Operational Efficiencies** – From both a level-of-service and financial perspective, an inherent imbalance would result between the nature and size of the T4 International Gateway Project and the FAA’s forecasts of domestic and international passengers.
6.5 DEVELOPMENT OPTION 1B

The primary features of Option 1B are:

- Proposed T4 narrowbody project and Concourse A in the short-term.
- Extensions to Concourses E and F to meet short- and medium-term demand.
- Landside development limited to the roadway improvements currently planned and other circulation improvements, including the pedestrian walkway and exit roadway improvements.
- Additional terminal area parking provided at intermodal center site within the roadway interchange, supplemented by interim remote surface parking on the West Side of the Airport.
- No investment in roadway and parking improvements within the terminal complex.
- Further the ability to expand the terminal complex beyond the 10-15 year demand level would be limited, therefore, the plan indicates no long-term expansion options.

Development Option 1B is shown on Figure 6-13 and described on the following pages.
6.5.1 Description

Terminal Development Option 1B is based on the premise that terminal development at the Airport would proceed with minimum capital expenditure. The fundamental goals of this option are:

- Move forward with a T4 narrowbody project and Concourse A in the short-term.
- Provide the minimum future investment necessary to meet short- to medium-term demand.

Terminal 1 – Concourse A would be developed as planned with five additional gates in Option 1B. This addition would likely relieve capacity constraints in the short-term. Concourses B and C would continue to be used as they are currently.

Terminal 2 – There would be no changes to Terminal 2 in Option 1B.

Terminal 3 – Option 1B envisages extensions to Concourses E and F and minor modifications to passenger processing and baggage screening areas of T3 to accommodate increased demand and added gates. Concourse E would be extended to add four new gates with a concessions/retail node at the end of the concourse. Concourse F would be extended to add five new gates with a concessions/retail node at the end of the concourse. As a result of the extensions, short- to medium-term demand would be met with limited capital investment. However, the configuration would likely increase the possibility of airside congestion due to increased dependency of aircraft on a single taxi lane between Concourses E and F.

Terminal 4 – T4 would proceed as a narrowbody terminal to meet short- to medium-term demand with improved efficiency and operations in Option 1B. The initial phase of this expansion would add 10 new gates to the east of Concourse H. However, this would likely result in the loss of four existing gates. In the following phase of development, a further 10 gates would be added to the west of Concourse H. Additionally, Concourse H would be demolished in this phase. This development program would eventually increase the gate capacity at T4 from the existing 10 gates to 20 air carrier and 3 commuter gates.

Terminal Area Parking – Option 1B provides for additional terminal area parking in the short-term. Subsequent phases of this development would allow approximately 5,000 new structured parking spaces to be developed at the site of the intermodal center at the entrance to the Airport.

Roadways and Curbside – Option 1B includes roadway improvements that would form part of the T4 narrowbody project. These improvements would increase capacity near T4 in the short- to medium-term. However, anticipated roadway congestion near T2 and T3 would not be resolved.

Short- and Long-term Capacity – As described earlier, Option 1B would allow for development of up to 79 gates, which is likely to be adequate to meet needs for next 10-15 years. However, this option would limit long-term expansion opportunities and may not provide for required aircraft gate capacity beyond 2020.

Compatibility with EIS Alternatives – This option is generally compatible in the short-term with all EIS alternatives under consideration. However, the location of the South Runway in Alternatives B4 and D2 would limit the area available south of T4 to provide for dual taxiways for the large narrowbody class of aircraft (Group III). Long-term, the extension of Concourse F would conflict with the Crosswind Runway, which is retained in Alternative B4.

6.5.2 Phasing

It was assumed in the phasing scenarios shown on Figure 6-14 that the first phase of the T4 narrowbody project and the development of Concourse A would proceed in Phase 1. The second phase of the T4 narrowbody project, and development of the parking structure at the intermodal center site would occur in Phase 2. Incremental gate/concourse additions to Terminal 3 would occur in Phases 2 and 3. Phasing of this development option would be challenging due to physical, operational, and financial constraints.

<table>
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<th>GATES LOST (–)</th>
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<tr>
<td>Phase 3</td>
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</table>
6.5.3 Operational Advantages and Disadvantages

The main advantages of Option 1B would be:

- Short-term capacity benefits from implementation of Concourse A.
- Faster delivery time for gate capacity than Option 1A provided by the T4 narrowbody project.
- Connection between T3 and T4 improves passenger flow and curbside capacity.
- Generally compatible in the short-term with EIS alternatives except for limitations on taxiway dimensions south of T4 under Alternatives B4 and D2. Would conflict in the long-term with Crosswind Runway in Alternative B4.

The main disadvantages of Option 1B would be:

- Limited potential for follow-on long-term development of the terminal complex due to the proposed configuration of T3.
- The inability of later phases to meet projected gate / parking demand.
- Poor airside access for aircraft taxiing to interior gates on Concourses E and F due to single taxi lane.
- Relatively modest improvements in passenger processing capabilities and level of service at T3.
- Low service levels for terminal roadway and parking due to the lack of added capacity within the terminal area.

6.5.4 Air Carrier Gate Capacity

Air carrier gate capacity and demand associated with Option 1B are shown on Figure 6-15. Figure 6-15 shows the relationship between the number of air carrier gates and gate use (measured in average turns per gate, where a turn is equal to one arrival + one departure). This relationship is also measured against historical and forecast numbers of enplaned passengers to show areas of over-capacity or capacity shortfall.

As shown, short-term gate demand would be met with the implementation of Concourse A and the T4 narrowbody project as planned. While it is possible that the Concourse E and F extensions would accommodate demand through the short-term, long-term growth options would be limited and the option to expand the terminal complex beyond 79 gates would be compromised.

6.5.5 Terminal Area Parking Capacity

Terminal area parking capacity and demand associated with Option 1B are shown on Figure 6-16. Figure 6-16 shows the relationship between terminal area parking spaces and use of these spaces compared to numbers of enplaned passengers to show areas of over-capacity or capacity shortfall.

As shown, short-term parking demand would be met with implementation of the Cypress Garage. To accommodate demand midway through the planning period, additional terminal area parking capacity would be developed at the intermodal center site, supplemented by remote surface parking on the West Side of the Airport on an interim basis.

While the exact timing of the intermodal center parking is unknown, by the time this project is implemented and additional terminal area parking spaces are available, there is likely to be a shortfall in terminal area parking capacity with respect to forecast traffic.
6.5.6 Financial Analysis

The preliminary financial highlights for this development option, prior to Master Plan Update - Phase 2 refinements and stakeholder inputs, include:

Program Phasing – The phasing of projects under Option 1B is shown on Figure 6-17, and was structured to maintain flat CPE levels at FLL that are consistently well below the 75th percentile for CPE at large hub airports through 2020.

- The eastern segment of the T4 narrowbody project was assumed to be completed by 2012.
- As the cost per gate of the T4 narrowbody project was estimated to be lower than that of the T4 International Gateway Project, financial capacity was projected to be available to complete the Concourses E and F extensions by 2016, 2 years earlier than under Option 1A. The western segment of the T4 narrowbody project was assumed to be completed in 2019.
- As under Option 1A, increased parking requirements were assumed to be met by constructing surface parking on the West Side of FLL and structured parking was then assumed to be constructed in part of the intermodal center site to meet parking needs associated with the terminal facilities through 2020.

Financial Effects – Option 1B is estimated to have the lowest capital cost of the five options through 2020, the primary advantage of this option.

- Cost per Enplaned Passenger (CPE) – Under Option 1B, CPE is estimated to increase in 2012 to and remain at approximately $11.00 through 2020, less than the 75th percentile versus other large hub airports. As the CPE levels at other large hub airports increase over time, by 2020, CPE levels under Option 1B would be close to the median projected for other large hub airports.

- Use of PFC Revenues – Consistent with the priority for application of PFC revenues outlined in Section 4.3.1.50 of each $4.50 PFC would be committed to pay for noise mitigation programs. As the T4 narrowbody development costs are estimated to be low, after 2012, 80% of remaining PFC revenues is assumed to be used to offset terminal development costs, and 20% is assumed to be used for roadway and access projects.

- Debt per Enplaned Passenger (DPE) – DPE is estimated to increase to about $105 in 2011, just above the median but well below the 75th percentile versus other large hub airports. DPE would then gradually decrease to about $95 by 2020 as debt is amortized and the number of enplaned passengers increases.

Development Risks – This option entails the following development risks:

- Flexibility to Match Development with Demand – Option 1B has more manageable sizing and phasing of capital investments than Option 1A and more closely matches the nature and volume of the FAA TAF. The more even pace of capital investments envisioned under Option 1B would enhance the County’s ability to respond to future Airport improvement needs, both planned and unplanned.

- Project Interdependencies – The projects under this option could be constructed fairly independently of one another. Failure to complete one of the projects would not likely jeopardize other facilities.

- Amount of Concurrent Development – Under this option, there would be six large capital projects under construction concurrently at the peak of construction, which may be a challenge in terms of obtaining labor, providing construction staging areas, and possible cost of materials.

- Degree of Front-loading of Capital Costs – Approximately 66% of the capital costs under this option would be incurred through 2014, i.e., halfway through the period to 2020.

- Demolition of Existing Facilities – The only structured facility to be demolished under Option 1B would be the existing T4, which would help minimize costs of development elsewhere on the Airport.

- Operational Efficiencies – The key downside risk under Option 1B would be that operating costs would increase for the County and the airlines due to increasing operational inefficiencies over the course of the program.

![Figure 6-17 PROJECT PHASING—OPTION 1B](image-url)
6.6 DEVELOPMENT OPTION 2A

Development Option 2A has both short- and long-term potential. Option 2A involves the redevelopment of the terminal complex over a 20+ year period. The primary features of Option 2A are:

- Proposed widebody T4 International Gateway Project and Concourse A expansion in the short-term.
- Redevelopment of T2 and T3 in subsequent phases to meet short- and long-term demand.
- Significant roadway improvements to T2, T3, and T4 by integrating passenger processing facilities and providing continuous curbside and additional bypass capability on the roads to meet long-term demand.
- Additional terminal area parking would be provided through the development of a new facility on the intermodal center site within the roadway interchange, followed by redevelopment of the Palm Garage. Also, supplemental remote surface parking on the West Side of the Airport would be provided on an interim basis.
- The ability to expand the terminal complex beyond the 10-15 year period. Additionally, Option 2A can be expanded to meet demand beyond 2020.

The short-term development plan for Option 2A is shown on Figure 6-18 and described on the following pages.

6.6.1 Short-term Development Plan

The short-term plan for Development Option 2A is based on the premise that terminal development at the Airport would proceed, with projects already in the planning phase by the end of the master planning and EIS processes. The fundamental goals for this option are to:

- Move forward with the T4 International Gateway Project and Concourse A expansions as currently planned.
- Begin the process of redevelopment of T3 by extending Concourse F to the West for eventual modification to a midfield pier.
Interim remote surface parking would be provided to supplement the loss of parking capacity during the redevelopment of the Palm Garage site.

**Roadways and Curbside** - Option 2A includes roadway improvements that would form a part of the T4 International Gateway Project. These improvements would increase capacity near T4 in the short-term. In addition, the roadway congestion near T2 and T3 would likely be improved by the provision of a bypass road, which would add more curbside at T3 to meet demand resulting from the addition of gates to Concourse F.

**Short-term Capacity** - As described earlier, the short-term plan for Option 2A would meet demand in the 10-15 year period. Further, this plan would also be flexible for long-term expansion beyond 2020.

**Compatibility with EIS** - As described earlier, Option 2A would not be compatible with EIS Alternatives B4 and D2.

### 6.6.2 Long-term Development Plan

The long-term plan for Development Option 2A (shown on Figure 6-19) is based on the premise that crossing Runway 13-31 would eventually be decommissioned, and that improvements and modifications to T2 that were started in earlier phases would be continued to meet long-term demand. The fundamental goals for long-term development are:

- Continue with the development of T3 by establishing a midfield pier.
- Continue to provide terminal area gate capacity to meet demand beyond 2020.
- Continue to improve airport surface parking and access (including eventual automated people mover access) to meet demand beyond 2020.

**Terminal 1** - There would be no modifications to T1 planned in the long-term plan under Option 2A.

**Terminal 2** - The long-term plan for Option 2A envisages continuing changes to T2 to improve airport surface parking and push back from gates. These improvements would also improve efficiencies with T3 and configure gates around a more compact continuous terminal complex.

**Terminal 3** - The long-term plan for Option 2A envisages further additions to the extensions to Concourse F, with the development of a midfield pier that is (doubly loaded) This development would add gates to T3, with modifications to passenger processing and baggage screening areas to accommodate increased demand and added gates.

The midfield pier at the end of Concourse F would be extended to add 20 new gates, with the loss of 4 existing gates.

Concourse E would be replaced with a more simple wrap-around terminal configuration. This redevelopment would not add gates, but would improve airport circulation.

**Terminal 4** - There would be no additional modifications to T4 planned in the long-term development plan under Option 2A.

**Terminal Area Parking** - The long-term plan for Option 2A would provide for additional terminal area parking due to the redevelopment of the Palm Garage. This redevelopment would add approximately 1,300 additional structured parking spaces and also improve the terminal roadway near T2 and T3.

**Roadways and Curbside** - Long-term runway improvements under Option 2A would include curbside improvements, additional capacity to the exit roadways, and the eventual commissioning of an automated people mover system that is planned to be integrated with the intermodal center and the Port, as well as with regional light-rail. As described earlier, the redevelopment of the Palm Garage would also improve circulation and capacity as the roadway corners and curve at T2 and T3 are improved.

**Long-term Capacity** - As described earlier, the long-term plan for Option 2A would meet capacity beyond 2020, and could be developed flexibly as demand warrants.

**Compatibility with EIS** - As described earlier, Option 2A would not be compatible with all EIS alternatives under consideration.
LONG TERM DEVELOPMENT
OPTION 2A

- 90+ air carrier aircraft gates
- 18,000+ structured parking stalls

OPTION 2A FEATURES INCLUDE:
- Provision for long-term capacity up to 90+ gates
- Proposed widebody T4 International Gateway Project and Concourse A
- Terminal complex linked together to provide more curb area for passenger pickup and drop-off
- Near-term capacity relief
- More expensive than Option 2B
- Short-term development would not be compatible with EIS Alternatives B4 and D2.
- Long-term development would not be compatible with EIS Alternatives B4 and D2.
6.6.4 Phasing

It was assumed in the phasing scenarios on Figure 6-20 that the first phase of the T4 International Gateway Project and the development of Concourse A would proceed in Phase 1. The second phase of the T4 International Gateway Project and development of the parking structure at the intermodal center site would occur in Phase 2. Incremental gate/concourse additions to Terminal 3 and the remodeling of the Palm Garage would occur in Phase 3.

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Notes:
(a) Assuming that crosswind Runway 13-31 is decommissioned.
(b) Assuming that crosswind Runway 13-31 is operational.
6.6.5 Air Carrier Gate Capacity

Air carrier gate capacity and demand associated with Option 2A are shown on Figure 6-21. Figure 6-21 shows the relationship between the number of air carrier gates and the use of gates (measured in average turns per gate, where a turn is equal to one arrival + one departure). This relationship is also measured against historical and forecast numbers of enplaned passengers to show areas of over-capacity or capacity shortfall.

As shown, short-term gate demand would be met with the implementation of Concourse A and the T4 International Gateway Project. While it is possible that the Concourse F extension and the midfield pier would accommodate demand after 2020, this option is predicated on the decommissioning of crosswind Runway 13-31.

6.6.6 Terminal Area Parking Capacity

Terminal area parking capacity and demand associated with Option 2A are shown on Figure 6-22. Figure 6-22 shows the relationship between terminal area parking spaces and use of these spaces as measured against numbers of enplaned passengers to show areas of over-capacity or capacity shortfall.

As shown, short-term parking demand would be met with implementation of the Cypress Garage. To accommodate demand midway through the planning period, additional terminal area parking capacity would be developed at the intermodal center site, supplemented by remote surface parking on the West Side of the Airport on an interim basis.

While the exact timing of the intermodal center parking is unknown, by the time this project is implemented and additional terminal area parking spaces are available, there is likely to be a shortfall in terminal area parking capacity with respect to forecast traffic.
6.6.7 Financial Analysis

The preliminary financial highlights for this development option, prior to Master Plan Update - Phase 2 refinements and stakeholder inputs, include:

Program Phasing – The phasing of projects under Option 2A, shown on Figure 6-23, was structured to minimize CPE levels through 2020, although the County is not projected to be able to maintain CPE levels below the 75th percentile projected for other large-hub airports while providing needed gate capacity.

As in Option 1A, the eastern and larger segment of the T4 International Gateway Project was assumed to be completed by 2013 with interim surface parking on the West Side completed by 2012. With the significant investment in the eastern T4 International Gateway Project, limited financial capacity was projected to remain for further terminal development if the County were to remain at or below the 75th percentile relative to other large-hub airports in terms of CPE.

The western T4 International Gateway Project was assumed to be completed by 2016 with structured parking constructed on part of the Intermodal Center site by 2014.

Preserving long-term terminal redevelopment opportunities under Option 2A requires significant additional terminal area parking and curbside prior to the completion of T3 short-term development. The remodeling of the Palm Garage and construction of additional curbside for T3 were assumed to be completed by 2017. Short-term T3 development was assumed to be completed by 2019.

Financial Effects – Option 2A is estimated to have the highest capital cost of the five options through 2020.

Cost per Enplaned Passenger (CPE) – Under Option 2A, CPE would increase to approximately $13.00 in 2012, $18.00 in 2017, and $19.00 in 2020. CPE levels would exceed those projected for the 75th percentile of other large-hub airports.

Use of PFC Revenues – Consistent with the priority for application of PFC revenues outlined in Section 4, $1.50 of each $4.50 PFC would be committed to pay for noise mitigation programs. All remaining PFC revenues after 2012 were assumed to be used to offset terminal development costs through 2020.

Debt per Enplaned Passenger (DPE) – DPE would increase to about $120 in 2012 and continue to increase to $130 in 2017, above the median but below the 75th percentile versus projections for other large-hub airports. DPE would then gradually decrease to about $115 by 2020 as debt is amortized and numbers of enplaned passengers increase.

Flexibility to Match Development with Demand – This option entails the following development risks:

Project Interdependencies – The projects envisioned under this option could be constructed fairly independently of one another. Failure to complete one of the projects would not likely jeopardize other facilities.

Amount of Concurrent Development – Under this option, six large capital projects would be under construction concurrently at the peak of construction, which may be a challenge in terms of obtaining labor, providing construction staging areas, and possible cost of materials.

Figure 6-23 PROJECT PHASING—OPTION 2A

- Degree of Front-loading of Capital Costs – Approximately 70% of the capital costs under this option would be incurred through 2014, i.e., halfway through the period to 2020.
- Demolition of Existing Facilities – Under Option 2A, the existing T4, Palm Garage, and T3 roads would need to be demolished and replaced, contributing to the capital costs of this option.
- Efficiency and Flexibility – Implementation of the T4 International Gateway Project would challenge the Airport’s financial capabilities in the short term, and compromise the schedule for future phases of development. Operational costs for both the Airport and the airlines would also be burdened by the compromises in passenger service and operational efficiency until future phases could be implemented. As passenger service and operational efficiency is compromised, costs associated with Airport and airline operations would escalate.
Development Option 2B has both short- and long-term potential. Option 2B involves the redevelopment of the terminal complex over a 20+ year period. The primary features of Option 2B are:

- Proposed T4 narrowbody project and Concourse A in the short-term.
- Redevelopment of T2 and T3 in subsequent phases to meet short- and long-term demand.
- Significant roadway improvements to T2, T3, and T4 by integrating passenger processing facilities and providing continuous curbside and additional bypass capability on the roads to meet long-term demand.
- Additional terminal area parking will be provided through the development of a new facility in the intermodal center site within the roadway interchange, followed by redevelopment of the Palm Garage. Also, supplemental remote surface parking on the West Side of the Airport would be provided on an interim basis.
- The ability to expand the terminal complex beyond the 10-15 year period. Additionally, Option 2B can be expanded to meet demand beyond 2020.

The short-term development plan for Option 2B is shown on Figure 6-24 and described on the following pages.
**Terminal 1 –** Concourse A would be developed as planned with five additional gates in Option 2B. This addition would likely relieve capacity in the short-term. Concourses B and C would continue to be used as they are currently.

**Terminal 2 –** There would be no changes to Terminal 2 in the short-term plan for Option 2B, except that processing and baggage areas would be linked to T3. Two existing gates would lose in the process.

**Terminal 3 –** Option 2B envisages extensions to Concourse F, and modifications to passenger processing and baggage screening areas of T3 to accommodate increased demand and added gates. Additionally, T3 would be linked at the passenger processing and baggage areas to T2 and T4, creating common curbside and processing facilities.

Concourse F would be extended to add 16 new gates with a concessions/retail node at the end of the concourse. As a result of the extension, short- to medium-term demand would likely be met with limited capital investment. However, the configuration would also increase the possibility of acreage congestion due to increased dependency of aircraft on a single taxi lane between Concourses E and F. Additionally, it may not be possible to use all gates on the South Side of the concourses node until crossroad Runway 13-31 is decommisioned.

**Terminal 4 –** The first phase of the T4 narrowbody project would proceed as currently planned in Option 2B. The initial phase of this expansion will add 10 new gates to the east of Concourse H. This would result in the loss of four existing gates. In the following phase of development, a further 10 gates would be added to the west of Concourse H. Additionally, Concourse H would be demolished in this phase. This development program would eventually increase the gate capacity at T4 from the existing 10 gates to 20 air carrier and 3 commuter gates. Further, the curbside would be continuous with that of T3, creating efficiencies in passenger and baggage processing.

**Terminal Area Parking –** The short-term plan for Option 2B provides for approximately 5,000 new structured parking spaces at the site of the intermodal center at the entrance to the Airport. The Palm Garage would then be redeveloped in subsequent phases.

Interim remote surface parking would be provided to supplement the loss of parking capacity during the redevelopment of the Palm Garage site.

**Roadways and Curbside –** Option 2B includes roadway improvements that would form a part of the T4 narrowbody project. These improvements would increase capacity near T4 in the short- to medium-term. In addition, roadway congestion near T2 and T3 would likely be improved by the provision of a bypass road, which would add more curbside at T3 to meet demand resulting from the addition of gates to Concourse F.

**Short-term Capacity –** As described earlier, the short-term plan for Option 2B would meet demand in the 10-15 year period. Further, this plan would also be flexible for long-term expansion beyond 2020.

**Compatibility with EIS Alternatives –** Option 2B is generally compatible in the short-term with all EIS alternatives under consideration. However, the location of the South Runway in Alternatives B4 and D2 would limit the area available south of T4 to provide four dual taxiways for the large narrowbody class of aircraft (Group III). In the long term, Option 2B would conflict with Alternative B4, which retains the Crosswind Runway.

**6.7.2 Long-Term Development Plan**

The long-term plan for Development Option 2B (shown on Figure 6-25) is based on the premise that crosswind Runway 13-31 would eventually be decommissioned and that improvements and modifications to T3, which were started in earlier phases, would be continued to meet long-term demand. The fundamental goals for long-term development are to:

- Continue with the development of T3 by establishing a midfield pier.
- Continue to provide terminal area gate capacity to meet long-term demand beyond 2020.
- Continue to improve terminal area parking and access (including automated people mover access) to meet long-term demand beyond 2020.

**Terminal 1 –** There would be no modifications to T1 in the long-term plan for Option 2B.

**Terminal 2 –** The long-term plan for Option 2B envisages continuing changes to T2 to improve airside circulation and push-back from gates. These improvements would also improve efficiencies with T3 and wrap gates around a more compact continuous terminal complex.

**Terminal 3 –** The long-term plan for Option 2B envisages further additions to the extensions to Concourse F, with the development of a midfield pier that is (double-loaded.) This development would add gates to T3 with modifications to passenger processing and baggage screening areas of T3 to accommodate increased demand and added gates. Additionally, some of the gates on the northern half of the pier would serve as international widebody gates.

The midfield pier at the end of Concourse F would be extended to add 20+ new gates, with the loss of 4 existing gates.

Concourse E would be replaced with a more linear east-west pier. This redevelopment would not add gates, but would improve airside circulation.

**Terminal 4 –** No additional modifications to T4 will be included in the long-term development plan for Option 2B.

**Terminal Area Parking –** The long-term plan for Option 2B would provide for additional terminal area parking due to the redevelopment of the Palm Garage. This redevelopment would add approximately 1,300 structured parking spaces and also improve the terminal roadway near T2 and T3.

**Roadways and Curbside –** Long-term roadway improvements under Option 2B would include curbside improvements, additional capacity to the exit roadways, and the eventual commissioning of an automated people mover system that is planned to be integrated with the intermodal center and the Port, as well as with regional light-rail. As described earlier, redevelopment of the Palm Garage would also improve circulation and capacity as the roadway corners and curve at T2 and T3 are improved.

**Long-term Capacity –** As described earlier, the long-term plan for Option 2B would meet capacity beyond 2020, and could be developed flexibly as demand warrants.

**Compatibility with EIS –** As described earlier, Option 2B would not be compatible with EIS alternatives in the long-term if Crosswind Runway 13-31 is not decommisioned.

**6.7.3 Operational Advantages and Disadvantages**

The main advantages of Option 2B are:

- Short-term capacity benefits from implementation of Concourse A and the T4 narrowbody project.
- Faster delivery time of near-term gate capacity than Option 2A provided by T4 narrowbody project.
- More flexibility in assigning central location for international gates.
- Enhanced airside access for aircraft taxiing to T3 due to the reconfiguration of Concourses E and F.
- Improved inter-terminal passenger flow, provided by connecting T2, T3, and T4.
- Greater level of service for curb access, roadway circulation, and parking facilitated by the redevelopment of the Palm Garage site and associated roadway improvements.
- Preserves option for long-term development beyond 2020.
- Long-term reconfiguration of T2 would mitigate conflict between aircraft pushing back from T2 gates and Taxiway C flow.
- Generally compatible in the short-term with EIS alternatives except for limitations on taxiway dimensions south of T4 under Alternatives B4 and D2. Would conflict in the long-term with the Crosswind Runway in Alternative B4.

The main disadvantages of Option 2B are:

- Operational and phasing impacts during the modifications to T2 and T3.
- Limited area available within the terminal area to continue to add close-in parking.
- Increased distance from terminal curb to aircraft gates.
- Loss of terminal area parking during redevelopment of the Palm Garage site.
LONG-TERM DEVELOPMENT
OPTION 2B

- 90+ air carrier aircraft gates
- 18,000+ structured parking stalls

OPTION 2B FEATURES INCLUDE:
- Provision for long-term capacity up to 90+ gates
- T4 narrowbody project and proposed Concourse A
- Centralized international gates on West Side of terminal area
- Terminal complex linked together to provide more curb area for pick-up and drop-off
- Lower financial implications than Option 2A
- Short-term development would be generally compatible with all EIS alternatives, except for limitations on taxiway dimensions south of T4 under Alternatives B4 and D2.
- Long-term development would not be compatible with EIS Alternative B4.
6.7.4 Phasing

It was assumed in the phasing scenarios shown on Figure 6-26 that the first phase of the T4 narrowbody project and the development of Concourse A would proceed in Phase 1. The second phase of the T4 narrowbody project and development of the parking structure at the intermodal center site would occur in Phase 2. Incremental gate/concourse additions to Terminal 3 and the remodeling of the Palm Garage would occur in Phase 3.

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Notes:
(a) Assuming that crosswind Runway 13-31 is decommissioned.
(b) Assuming that crosswind Runway 13-31 is operational.
6.7.5 Air Carrier Gate Capacity

Air carrier gate capacity and demand associated with Option 2B are shown on Figure 6-27. Figure 6-27 shows the relationship between the number of air carrier gates and the use of gates (measured in average turns per gate, where a turn is equal to one arrival + one departure). This relationship is also measured against historical and forecast numbers of enplaned passengers to show areas of over-capacity or capacity shortfall.

As shown, short- to medium-term gate demand would be met with implementation of Concourse A and the T4 narrowbody project. While it is possible that the Concourse F extension and the midfield pier would accommodate demand after 2020, this option is predicated on the decommissioning of crosswind Runway 13-31.

6.7.6 Terminal Area Parking Capacity

Terminal area parking capacity and demand associated with Option 2B are shown on Figure 6-28. Figure 6-28 shows the relationship between terminal area parking spaces and use of these spaces as measured against numbers of enplaned passengers to show areas of over-capacity or capacity shortfall.

As shown, short-term parking demand would be met with implementation of the Cypress Garage. To accommodate demand midway through the planning period, additional terminal area parking capacity would be developed at the intermodal center site, followed by redevelopment of the Palm Garage. Also, supplemental remote surface parking on the West Side of the Airport would be provided during this period on an interim basis.

While the exact timing of the intermodal center parking is unknown, by the time this project is implemented and additional terminal area parking spaces are available, there is likely to be a shortfall in terminal area parking capacity with respect to forecast traffic.
6.7.7 Financial Analysis

The preliminary financial highlights for this development option, prior to Master Plan Update—Phase 2 refinements and stakeholder inputs, include:

Program Phasing – The phasing of projects under Option 2B is shown on Figure 6.29, was structured to minimize CPE levels through 2020, although the County is not projected to be able to maintain CPE levels below the 75th percentile projected for other large-hub airports while providing needed gate capacity.

- The eastern segment of the T4 narrowbody project was assumed to be completed by 2012. Short-term T3 development was assumed to be completed by 2018.

- Increased parking requirements were assumed to be met by constructing surface parking on the West Side of FLL, and structured parking was then assumed to be constructed in part of the intermodal center site to meet parking needs by 2014. The western segment of the T4 narrowbody project was assumed to be completed in 2017.

- Preserving long-term terminal redevelopment under Option 2B would require significant additional terminal area parking and curbside prior to the completion of short-term T3 development. The remodeling of the Palm Garage and construction of additional curbside for T3 would assumed to be completed by 2017.

- Without the upfront use of financial capacity required by the T4 International Gateway Project, the County is projected to be able to provide air carrier gate capacity to meet demand and keep CPE levels below the 75th percentile relative to other large-hub airports under Option 2B.

Financial Effects – Option 2B is estimated to have the second lowest capital costs of the five options through 2020.

- Cost per Enplaned Passenger (CPE) – Under Option 2B, CPE would increase to the $13.00 to $14.00 range between 2012 and 2018 and decrease slightly thereafter. Those levels of CPE would be at or just below the 75th percentile versus other large-hub airports.

Use of PFC Revenues – Consistent with the priority for application of PFC revenues outlined in Section 4, $1.50 of each $4.50 PFC would be committed to pay for noise mitigation programs. A majority of the remaining PFC revenues were assumed to be used to offset terminal development costs, except for approximately $5.0 million of PFC revenue available for parking and roadways projects annually between 2013 and 2016.

- Debt per Enplaned Passenger (DPE) – DPE would increase to about $100 in 2011, just above the median but well below the 75th percentile versus other large-hub airports. DPE would then gradually decrease to about $60 by 2020 as debt is amortized and numbers of enplaned passengers increase.

Development Risks – This option entails the following development risks:

- Flexibility to Match Development with Demand – Option 2B has more manageable sizing and phasing of capital investments than Option 2A and more closely matches the nature and volume of demand forecast in the FAA TAM. The more even pace of capital investments envisioned under Option 2B would enhance the County’s ability to respond to future Airport improvement needs, both planned and unplanned. While terminal and parking facilities can be increased in increments sized to meet demand as it materializes, the associated intermodal center parking and roadway projects cannot be constructed incrementally.

- Project Interdependencies – The projects under this option could be constructed fairly independently of one another. Failure to complete one of the projects would not likely jeopardize other facilities.

- Amount of Concurrent Development – Under this option, six large capital projects would be under construction concurrently at the peak of construction, which may be a challenge in terms of obtaining labor, providing construction staging areas, and possible cost of materials.

- Degree of Front-loading of Capital Costs – Approximately 77% of the capital costs under this option would be incurred through 2014, i.e., halfway through the period to 2020.

- Demolition of Existing Facilities – Fewer Facilities – The existing Palm Garage and T3 roadways—would need to be demolished and rebuilt for the short-term T3 redevelopment under Option 2B than Option 2A, reducing cost and increasing efficiency.

- Efficiency and Flexibility – The key risk under Option 1B may be that operating costs would increase for the County and the airlines due to increasing operational inefficiencies over the course of the program.

![Figure 6.29: Project Phasing—Option 2B](image-url)
Development Option 2C has both short- and long-term potential. Option 2C involves the redevelopment of the terminal complex over a 20+ year period. The primary features of Option 2C are:

- Proposed T4 narrowbody project and Concourse A in the short-term.
- Redevelopment of T2 and T3 in subsequent phases to meet short- and long-term demand.
- Additional terminal area parking would be provided through redevelopment of the Palm Garage as a centralized passenger processing facility with parking above. Also, a new facility would be developed on the intermodal center site within the roadway interchange and supplemental remote surface parking on the West Side of the Airport would be provided on an interim basis.
- Significant roadway improvements to T2, T3, and T4 by integrating passenger processing facilities and providing continuous curbside and additional bypass capability on the roadway to meet long-term demand.
- The ability to expand the terminal complex beyond the 10-15 year period. Additionally, Option 2C could be expanded to meet demand beyond 2020.

The short-term development plan for Option 2C is shown on Figure 6-30 and described on the following pages.

### 6.8.1 Short-Term Development Plan

The short-term plan for Development Option 2C is based on the premise that terminal development at the Airport would proceed, with projects already in the planning phase by the end of the master planning and EIS processes. The fundamental goals for this option are to:

- Move forward with a T4 narrowbody project.
- Move forward with Concourse A as currently planned.
- Begin the process of redeveloping of T2 and T3, thereby creating an integrated north terminal.
- Redevelop the Palm Garage to create a centralized passenger processing facility with parking, and redesign roadways near T2 and T3.
Terminal 1 – Concourse A would be developed as planned with five additional gates in Option 2C. This addition will likely relieve capacity in the short-term. Concourses B and C would continue to be used as they are currently.

Terminal 2 – T2 would be redeveloped in conjunction with T3 Concourse E to create a single north terminal that has common baggage screening, make-up, and bag-claim areas with a centralized concessions/retail space. The north terminal would be served by a centralized passenger processing facility located at the site of the redeveloped Palm Garage.

Terminal 3 – T3 Concourse E would be redeveloped in conjunction with T2 to create a single north terminal that has common baggage screening, make-up, and bag-claim areas with a centralized concessions/retail space. As discussed above, the north terminal would be served by a centralized passenger processing facility located at the site of the redeveloped Palm Garage. T3 Concourse F would also be served by the centralized passenger processing facility. Additional curbside would be provided by linking T3 with T2 and T4. This would allow the provision of a bypass road at T3. This redevelopment would add 29 gates to the north terminal with a loss of the original 20 gates between T2 and T3.

Terminal 4 – The first phase of the T4 narrowbody project would proceed as currently planned in Option 2C. The initial phase of this expansion would add 10 new gates to the east of Concourse H. This would result in the loss of four existing gates. In the following phase of development, a further 10 gates would be added to the west of Concourse H. Additionally, Concourse H would be demolished in this phase, and T4 would be linked to the centralized passenger processing facility. This development would eventually increase the gate capacity at T4 from the existing 10 gates to 20 air carrier and 3 commuter gates. Further, the curbside would be continuous with that of T3, creating efficiencies in passenger and baggage processing.

Terminal Area Parking – The short-term plan for Option 2C, the Palm Garage would be redeveloped to eventually add 1,300 spaces to the existing 2,700 structured parking spaces. This process would allow the development of bypass roads at the redeveloped Palm Garage, which now serves as the centralized passenger processing facility, with parking. Additional curbside would also be provided at T3 to meet demand resulting from the addition of gates to the north terminal.

Before the redevelopment of the Palm Garage, additional terminal area parking would be needed to add approximately 5,000 new structured parking spaces at the site of the intermodal center at the entrance to the Airport. interim remote surface parking would be provided to supplement the loss of parking capacity during the redevelopment of the Palm Garage site.

Roadways and Curbside – Option 2C includes roadway improvements that would form a part of the T4 narrowbody project. These improvements would likely increase capacity near T4 in the short-to-medium term. Roadway congestion near T2 and T3 would likely be improved by the provision of a bypass road, adding more curbside at T3, to meet demand resulting from the addition of gates to the north terminal. The centralized processor would have to be phased very carefully given the existing operating conditions of the terminal area. Additional parking would also have to be provided before the redevelopment of the Palm Garage at the site of the intermodal center, as discussed earlier.

Short-term Capacity – As described earlier, the short-term plan for Option 2C meets capacity in the 10-15 year period. Further, this plan would also be flexible for long-term expansion beyond 2020.

Compatibility with EIS Alternatives – Option 2C is generally compatible in the short-term with all EIS alternatives under consideration. However, the location of the South Runway in Alternatives B4 and D2 would limit the area available south of T4 to provide for dual taxiways for the large narrowbody class of aircraft (Group III). In the short-term, Option 2C would conflict with Alternative B4, which retains the Crosswind Runway.

6.8.2 Long-Term Development Plan

The long-term plan for Development Option 2C (shown on Figure 6-31) is based on the premise that crosswind Runway 13-31 will eventually be decommissioned and that improvements and modifications to the terminal complex started in earlier phases would be continued to meet long-term demand. The fundamental goals for long-term development are to:

- Continue with the reconfiguration of T4 by extending the concourse to the west, creating a south terminal that will mirror the north terminal.
- Continue with the redevelopment of the terminal complex by establishing a connection with the south terminal.

- Continue to provide terminal area gate capacity to meet long-term demand beyond 2020.
- Continue to improve terminal area parking and access (including eventual automated people mover access) to meet long-term demand beyond 2020.

Terminal 1 – No modifications to T1 are included in the long-term plan for Option 2C.

North Terminal (T2/T3) – The long-term development plan for Option 2C envisages connecting the north terminal to the south terminal via a post-security corridor and holdroom area. This area would also house the widebody/international gates.

Additionally, Concourse F would be replaced by this development that connects the north terminal to the south terminal.

South Terminal (T3/T4) – T4 would be extended to the west and connected to the north terminal via the post-security corridor. This development creates a south terminal that mirrors the north terminal. The south terminal would add 21 gates. However, two gates at the end of the western edge of the south terminal would be lost in this phase.

Terminal Area Parking – The long-term plan for Option 2C provides for additional structured parking spaces at the site of the redeveloped Palm Garage and integrating this development with the centralized passenger processor. Additional parking would be provided at the site of the intermodal center in later phases.

Roadways and Curbside – The long-term plan for Option 2C includes roadway improvements that would form a part of the T4 narrowbody project. These improvements would increase capacity near T4 in the short-to-medium term. Roadway congestion near T2 and T3 would be improved by the provision of bypass roads at the centralized passenger processing facility and at the remodeled T3 curbside. This project would provide additional curbside at T3 to meet demand resulting from the addition of gates to Concourse F.

The continued phased of the centralized passenger processing facility will have to be implemented very carefully given the existing operating conditions of the terminal area.

Long-term Capacity – As described earlier, the long-term plan for Option 2C would meet capacity beyond 2020, and could be developed flexibly as demand warrants.

Compatibility with EIS Alternatives – As described earlier, Option 2C would not be compatible with all EIS alternatives under consideration. Option 2C would be in conflict with Alternative B4 in the long-term if crosswind Runway 13-31 is not decommissioned.

6.8.3 Operational Advantages and Disadvantages

The main advantages of Option 2C are:

- Short-term capacity benefits from implementation of Concourse A, the T4 narrowbody project, and the north terminal project.
- Faster delivery time of short-term gate capacity than Option 2A provided by T4 narrowbody project.
- Short-term integration of T2 and Concourse E would mitigate conflict between aircraft pushing back from T2 gates and Taxiway C flow.
- Improved inter-terminal passenger flow provided by connecting T2, T3, and T4.
- Greater level of service for curb access, roadway circulation, and parking facilitated by the redevelopment of the Palm Garage site and associated roadway improvements.
- Landside efficiencies due to shared facilities in centralized passenger processing facility.
- Preserves option for long-term development beyond 2020.

The main disadvantages of Option 2C are:

- Longer lead time and phasing impacts during integration of T2 and Concourse E.
- Phasing and facility development challenges presented by short-term development of centralized passenger processor at Palm Garage site. Additionally, there would be a shortage of terminal area parking in the short-term.
- Loss of terminal area parking capacity in the long-term.
- Accelerated schedule for development of parking at intermodal center site.
- Limited area available within the terminal area to continue to add close-in parking.
- Increased distance from terminal curb to aircraft gates.
LONG-TERM DEVELOPMENT
OPTION 2C

- 90+ air carrier aircraft gates
- 17,000+ structured parking stalls

OPTION 2C FEATURES INCLUDE:
- Provision for long-term capacity up to 90+ gates
- T4 narrowbody project and proposed Concourse A
- Centralized passenger processing in a central facility at the site of current Palm Garage
- Centralized international gates on West Side of terminal area
- Terminal complex linked together to provide more curb area for pick-up and drop-off
- Short-term development would be generally compatible with all EIS alternatives, except for limitations on taxiway dimensions south of T4 under Alternatives B4 and D2.
- Long-term development would not be compatible with EIS Alternative B4.
6.8.4 Phasing

It was assumed in the phasing scenarios on Figure 6-32 that the first phase of the T4 narrowbody project and the development Concourse A would proceed in Phase 1. The second phase of the T4 narrowbody project, development of the north terminal, redevelopment of the Palm Garage, and development of the parking structure at the intermodal center site would occur in Phase 2. Incremental gate/concourse additions to the connector between the north terminal and the south terminal, and development of the south terminal would occur in Phase 3.

<table>
<thead>
<tr>
<th>PHASING</th>
<th>GATES</th>
<th>GAINED (+)</th>
<th>LOST (-)</th>
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<td>Phase 3</td>
<td>24</td>
<td>12</td>
<td>91</td>
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6.8.5 Air Carrier Gate Capacity

Air carrier gate capacity and demand for Option 2C are shown on Figure 6-33. Figure 6-33 shows the relationship between the number of air carrier gates and gate use (measured in average turns per gate, where a turn is equal to one arrival + one departure). This relationship is also measured against historical and forecast numbers of enplaned passengers to show areas of over-capacity or capacity shortfall.

As shown, short- to medium-term gate demand would be met with the implementation of Concourse A and the T4 narrowbody project. These improvements, along with the north and south terminals, would accommodate demand through the long-term post-2020 period.

6.8.6 Terminal Area Parking Capacity

Terminal area parking capacity and demand for Option 2C are shown on Figure 6-34. Figure 6-34 shows the relationship between terminal area parking spaces and use of these spaces as measured against numbers of enplaned passengers to show areas of over-capacity or capacity shortfall.

As shown, short-term parking demand would be met with the implementation of the Cypress Garage. To accommodate demand midway through the planning period, additional terminal area parking capacity would be provided by redevelopment of the Palm Garage and development of a new facility at the intermodal center. Also, supplemental remote surface parking on the West Side of the Airport would be provided during this period on an interim basis.

While the exact timing of the intermodal center parking is unknown, by the time this project is implemented and additional terminal area parking spaces are available, there is likely to be a shortfall in terminal area parking capacity with respect to forecast traffic.

Additional parking made available through the redevelopment of the Palm Garage would be limited due to the passenger processing function of the new centralized passenger processing facility. This function will add to the lower capacity of the terminal area parking, especially in the short- to mid-term.
6.8.7 Financial Analysis

The preliminary financial highlights for this development option, prior to Master Plan Update - Phase 2 refinements and stakeholder inputs, include:

Program Phasing - The phasing of projects under Option 2C, shown on Figure 6-35, was structured to minimize CPE levels through 2020, although the County is not projected to be able to maintain CPE levels below the 75th percentile projected for other large-hub airports while providing needed gate capacity.

- The eastern segment of the T4 narrowbody project was assumed to be completed by 2012. Significant additional terminal area parking and curbside would be needed to preserve long-term terminal redevelopment, so parking and roadway projects were assumed to be completed as soon as possible without exceeding the 75th percentile for CPE.

- After completion of the centralized passenger processing facility, future terminal, parking, and roadways work could be performed in smaller increments sized to meet demand.

Financial Effects - Option 2C is estimated to have the second highest capital cost of the five options through 2020.

- Costs per Enplaned Passenger (CPE) - Under this option, the program can be financed while keeping CPE below the 75th percentile versus other large-hub airports through 2015. After 2015, CPE is projected to exceed the 75th percentile. Specifically, CPE would increase to $13.00 to $15.00 range between 2012 and 2018 and increase to the $16.00 to $17.00 range thereafter.

- Use of PFC Revenues - Consistent with the priority for application of PFC revenues outlined in Section 4, $1.50 of each $4.50 PFC would be committed to pay for noise mitigation programs. Because roadway projects would be accelerated under this option, higher levels of PFCs are available for those projects through 2013. All remaining PFC revenues after 2013 are assumed to be used to offset terminal development costs through 2020.

- Debt per Enplaned Passenger (DPE) - DPE is projected to increase to $115 by 2011 and remain at that level through 2020.

Development Risks - This option entails the following development risks:

- Flexibility to Match Development with Demand - Option 2C involves constructing a central processing unit and associated facilities that are "non-scalable", i.e., they are generally large-scale projects constructed upfront, rather than being built incrementally over time to track increases in demand. With the completion of the centralized passenger processing facility, future terminal, parking, and roadways work under Option 2C could be accomplished in smaller increments sized to meet demand.

- Project Interdependencies - Projects under this option are highly interdependent. If one of the projects were not completed, then the remaining set of facilities might not function at an acceptable level of service.

- Amount of Concurrent Development - Under this option, eight large capital projects would be under construction concurrently at the peak of construction, which would be a significant challenge in terms of obtaining labor, providing construction staging areas, and possible cost of materials.

- Degree of Front-loading of Capital Costs - Approximately 65% of the capital costs under this option would be incurred through 2014, i.e., halfway through the period to 2020.

- Demolition of Existing Facilities - All existing terminals, except for T1, may need to be substantially redeveloped or demolished and rebuilt to make incremental gains in gates.

- Operational Efficiencies - This option would provide the most efficient terminal complex configuration in the long-term while maximizing gate use, passenger convenience, and operations.
The Airport currently has undeveloped areas on the West Side and South Side that could accommodate a variety of functions, including, but not limited to, fixed base operators (FBOs) and general aviation (GA) operations, aircraft maintenance, air freight facilities, vehicle parking, and fuel storage. Land use opportunities that would be available in each area based on various airfield development alternatives currently under consideration in the Proposed South Runway Extension EIS process are examined in this section.

### 7.1 WEST SIDE PLAN

The West Side at FLL is currently bounded by I-95 to the west, future Taxiway C / Runway 9L-27R to the north, Taxiway E / crosswind Runway 13-31 to the east, and Taxiway G / Runway 9R-27L to the south, as shown on Figure 7-1. With the exception of Alternatives B4 and D2, the airfield alternatives currently under consideration in the Proposed South Runway Extension EIS process do not significantly alter the existing north and south boundaries of the West Side area, and, in most cases, would allow for the addition of about 20 acres of developable land to the east if Runway 13-31 were to be decommissioned.

The existing West Side land use plan was largely designed to accommodate the requirements of a single airline that no longer operates at the Airport and the plan does not account for the potential decommissioning of Runway 13-31 or the construction of a new north parallel runway in the future. Hence, the existing plan is in need of updating. Factors that were considered in developing an updated West Side land use plan are as follows:

- Overall, about 130 acres are available for development on the West Side, including the Sheltair leasehold.
- The area provides the County with the flexibility to accommodate different combinations of Airport uses.
- The West Side could accommodate most of the existing uses on the North Side if they need to be relocated to facilitate construction of a north parallel runway in the future, including relocation of the existing fuel farm to the West Side.
The West Side would provide the best location for a replacement aircraft rescue and fire fighting (ARFF) facility if the existing facility needs to be relocated to accommodate terminal development west of Terminal 3.

It is anticipated that a new Airport Traffic Control Tower (ATCT) will be required prior to 2020 to ensure FAA air traffic controller visibility of all apron areas as the passenger terminal expands. A review of potential ATCT sites indicated that the requirements for a new ATCT could best be met on the West Side, close to the existing ATCT.

An updated West Side land use plan should be flexible to allow for a mixture of uses as demand dictates and provide for the potential relocation of functions from the North Side in the event that the County elects to construct a new north parallel runway in the future.

Parcels should be reserved in the plan to provide for relocation of the fuel farm and ARFF facility and development of a new ATCT.

Based on the findings discussed above, multiple West Side plans were developed and evaluated as part of the Master Plan Update—Phase 1 process. A preferred West Side plan is shown on Figure 7-2 and described below.

A preferred West Side plan was developed to consolidate air cargo, maintenance, and GA facilities on the West Side, as shown on Figure 7-2.

As part of this plan, GA facilities would be relocated from the North Side to the West Side adjoining the South Runway and the future cross taxiways to facilitate airfield

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**WEST SIDE FINDINGS**

- The West Side is currently underutilized.
- About 130 acres of land are currently available for development on the West Side.
- The area provides opportunities for flexible use of land based on long-term development goals.

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A preferred West Side plan was developed to consolidate air cargo, maintenance, and GA facilities on the West Side, as shown on Figure 7-2.

As part of this plan, GA facilities would be relocated from the North Side to the West Side adjoining the South Runway and the future cross taxiways to facilitate airfield
access and use of the South Runway. Approximately 110 acres of GA facilities could be developed. Air cargo and maintenance facilities would eventually be relocated to the northern part of the West Side with easy apron/airfield access and access to Runway 9L-27R. Multiple air cargo ramps and a maintenance ramp would also be provided.

Further, the fuel farm and the ARFF facility would be relocated to the West Side. The ARFF facility would be located east of the ATCT, and the consolidated fuel farm would be located west of the existing Sheltair leasehold. These relocations would be part of the phased relocation of current North Side leaseholds to the West Side based on long-term development goals and land use priorities at the Airport.

### 7.2 SOUTH SIDE PLAN

If South Runway 9R-27L is extended in accordance with Proposed South Runway Extension EIS Alternative B1 or D1, the area south of this runway (South Side) would be available for limited development. As the Proposed South Runway Extension would involve elevating Runway 9R-27L over US 1, any land available on the South Side would have limited aviation-related use. A better option for these parcels is likely to be short-/long-term surface parking, as shown on Figure 7-3.

In the event that either Alternative B4 or D2 emerges as the preferred alternative at the end of the Proposed South Runway Extension EIS process, approximately 65 acres of developable land with airfield access would be available.
for GA and support facilities, as shown on Figure 7-4. If Alternative D2 is the preferred alternative, then existing facilities on the North Side would have to be relocated to facilitate construction of a new north parallel runway, and the South Side would serve as a potential location for GA and support facilities, as depicted on Figure 7-4.

7.3 GENERAL AVIATION

While general aviation activity levels at FLL in recent years have dropped below the peak reached in 1999 (see Figure 7-5), GA still accounted for about 21% of total FLL activity in 2005. As available land area and airfield capacity at FLL become more constrained, a key part of the Phase 1 work was to examine the appropriate long-term role for GA at FLL with respect to land use and number of operations. The key findings and land use implications of this evaluation are as follows:

- There are currently four FBOs at FLL—two on the North Side and two on the West Side, as shown on Figure 7-6. They occupy approximately 110 acres among them. The scattered locations of existing GA facilities create some inefficiencies for airfield operations.
- Ten major airports in the tri-county region of South Florida accommodate GA activity, as shown on Figure 7-7, and FLL has a relatively low share of total activity, as shown on Figure 7-8. Further, FLL’s share of GA activity is not expected to change significantly, as shown on Figure 7-9.
GA activity at the Airport is forecast to remain below the 1999 peak through the forecast period, as shown on Figure 7-5.

The current financial terms for GA operations are more favorable to aircraft operators at FLL compared to those at other congested large-hub airports in the United States, as shown on Figure 7-10.

**SUMMARY OF GA FEES AT MAJOR U.S. AIRPORTS**

- **Flight Line Fee**
- **Runway Fee**
- **TFR Fee**
- **Fuel Fee**
- **Landing Fee**
- **Parking Fee**
- **Notes**

**GENERAL AVIATION FINDINGS**

- FLL’s share of GA traffic relative to other airports in the Broward / Miami-Dade / Palm Beach tri-county area is a relatively low 4%.
- Additionally, forecast GA traffic through 2020 (per the FAA TAF) does not surpass the 1999 peak.
- The four FBOs at FLL are in multiple locations on the North Side and the West Side, which causes operational inefficiencies especially at peak periods when Runway 9L-27R is operating at capacity.
- Current financial terms for GA operations at FLL are more favorable to the aircraft operators compared to those at other congested large-hub airports.

**GENERAL AVIATION Phase 1 RECOMMENDATIONS**

- Consolidate GA facilities on the West Side to enhance airfield ground operations.
- Set aside land area on the West Side for GA traffic at the current Airport-wide acreage.
- Establish a timetable for BCAD to implement fees for GA operators that reflect their share of Airport costs and traffic.

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**Figure 7-8**

**Figure 7-9**

**Figure 7-10**
8 PHASE 1 CONCLUSIONS

The analyses completed to support Phase 1 of the FLL Master Plan Update indicate the following:

1. Broward County has the capacity to finance improvements at FLL to accommodate forecast demand while maintaining reasonable user costs as measured by broad industry standards for large-hub airports, although these costs would, in all cases, be higher than today’s airline costs at FLL.

2. If the County elects to do so, a set of Airport improvement projects can be identified to accommodate the traffic growth expected in the near-term (e.g., within a 10-year timeframe), and these projects could be initiated without having to resolve all of the issues related to FLL’s long-term development. This ability to advance near-term projects while FLL’s future size and mission in the long-term are being decided by the Board is available principally because a set of improvement projects that would accommodate forecast demand are common to most, if not all, future configurations of the Airport.

3. A decision by the FAA regarding the airfield configuration at FLL is critical to making non-airfield development decisions. In particular, disposition of the Crosswind Runway, location of a new South Runway, and the dislocations caused by a potential north parallel runway would have a direct effect on the amount and location of land that could be made available for development of other facilities. Master Plan Update decisions during Phase 2 should be informed by the expected results of the Proposed South Runway Extension EIS process.

4. Once FLL’s airfield alternatives have been narrowed through the FAA’s EIS process and associated County decisions, facility development options that allow the County to continuously manage impacts related to Airport growth will be available. Given the

availability of these “expandable” options for non-airfield facilities, the County can manage Airport growth and impacts in the context of an established and approved airfield configuration while preserving the potential to maximize FLL’s ultimate capacity in the future.

5. The County’s choices among development options to accommodate near-term demand will affect FLL’s potential to accommodate traffic when full build-out is achieved. Certain lower-cost options to accommodate near-term requirements are likely in the long-term to (a) limit FLL’s potential to accommodate traffic, and (b) provide lower levels of user service, convenience, and efficiency. Decisions about the next phase of Airport expansion will directly affect the ultimate potential of the Airport to serve the County’s needs, both in terms of capacity and service.

6. Consultation with stakeholders, including airlines, other Airport users, and nearby Broward County residents, is an important aspect of the information gathering and decision-making process of this Master Plan Update. The multiple development options presented in this report were designed to elicit comment, criticism, and input from stakeholders. It is intended that, from these inputs, (a) stakeholder values, particularly regarding the trade-offs between costs and level of service, will be revealed, (b) views on the limits of FLL’s potential to accommodate traffic can be debated, and (c) other options, in addition to those presented in this report, may emerge.

8.2 PREVIEW OF PHASE 2

The key initiatives that will facilitate the completion of the Master Plan Update in Phase 2 include:

- Stakeholder Outreach
- Board Decision-making Process
- Plan Implementation

8.2.1 Stakeholder Outreach

As noted earlier, Phase 1 of the Master Plan Update process was structured to identify facility requirements and options in relation to the FAA’s unconstrained TAF for 2020, consistent with the Proposed South Runway Extension EIS process. However, the “menu” of options was developed during Phase 1 with limited input from stakeholders. The two-phase Master Plan Update process was designed to provide stakeholders, during Phase 2, with well-defined, optional visions of FLL’s future to elicit constructive input to the Board’s decision-making process. In Phase 2, a series of forums will be conducted to brief stakeholders on the Phase 1 development options and the complex trade-offs facing decision-makers regarding the final build-out and configuration of the Airport. Stakeholders include Airport users, the airlines, Airport neighbors, and other interest groups affected by Airport development and operation.

8.2.2 Board Decision-making Process

The Board’s deliberations regarding the designation of a preferred development plan are anticipated to focus on, among other things, user costs, levels of service, capacity of the Airport to accommodate future traffic, and the effects of growth, both positive and negative. During Phase 2, the Phase 1 development options will continue to be refined to respond to input from stakeholders and the Board and any new findings that may emerge from the Proposed South Runway Extension EIS process. Underlying the decision-making process are several important linkages and relationships between and among various plan elements and development options that will be analyzed during Phase 2. Some of the linkages and relationships to be considered in the Board’s decision-making process include the following:

- Airside Terminal/Interface – Once the ultimate runway configuration for the Airport is established, the final terminal layout will be modified as necessary to provide for the efficient movement of aircraft on the ground between the gates and apron areas in the terminal complex and the runway and taxiway system on the airfield.
- Passenger Terminal Elements – Future terminal development will need to anticipate the requirements for passenger processing in the ticket lobby, baggage handling and baggage claim, security checkpoints, holdrooms, federal inspections for international arriving passengers, cruise passengers, and concession services. The requirements for these elements will be refined as needed based on input from stakeholders and the Board.
development costs and level-of-service to be assessed in Phase 2 include the following:

a. Provision of close-in structured parking versus lower-cost remote surface parking
b. Allowances for terminal circulation space per passenger
c. Maximum walking distances versus provision for people mover systems, such as moving walkways
d. Passenger wait times for movement systems, such as elevators, buses, and other people movers
e. Passenger wait times versus the number of ticketing, federal inspection, or security checkpoint facilities

Inherently, FLL is at a point where many facility development options are likely to include both higher costs and perceived reductions in level-of-service, at least in some elements of the Airport’s operation. Additionally, given that FLL has only a few “green field” sites left for facility development, an important aspect in evaluating level-of-service is the “inconvenience factor” associated with construction and construction phasing simply because obsolete facilities must be demolished to provide the opportunity for redevelopment of facilities with greater capacity and higher levels of service in the long term.

8.2.3 Plan Implementation

Following the Board’s designation of a preferred Airport development plan, steps will be taken to secure government agency approvals needed to facilitate subsequent implementation of elements of the plan. These steps will include obtaining FAA approval of the updated Airport Layout Plan and coordinating with State, County, and local officials, as required, to amend the County’s Comprehensive Plan so that it reflects the Airport Master Plan Update adopted by the Board.