2020 MASTER PLAN UPDATE

# Executive Summary

FORT LAUDERDALE-HOLLYWOOD INTERNATIONAL AIRPORT

BROWARD COUNTY FLORIDA

FORT LAUDERDALE-HOLLYWOOD INTERNATIONAL AIRPORT
BROWARD COUNTY, FLORIDA


# TABLE OF CONTENTS

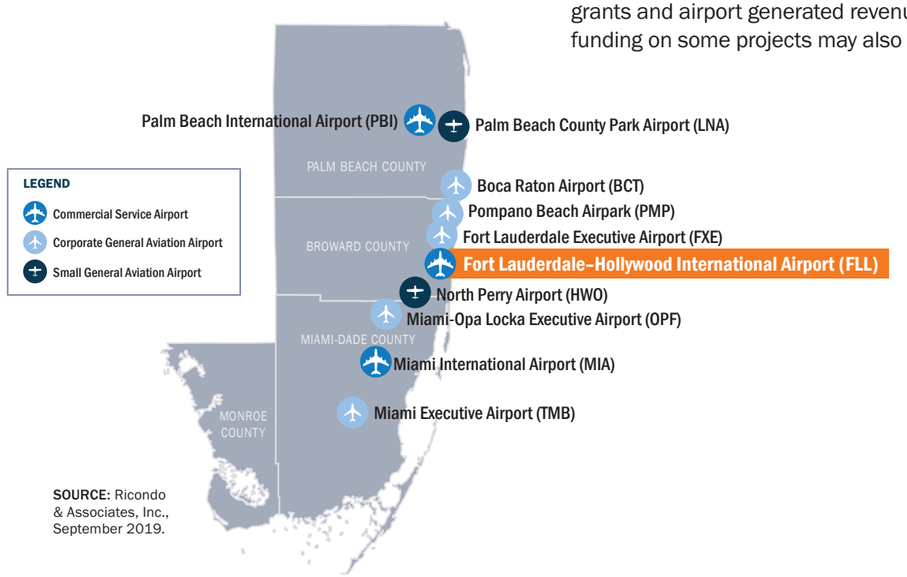
# 1 Introduction

Fort Lauderdale-Hollywood International Airport (FLL or the Airport) is owned by Broward County and operated by the Broward County Aviation Department (BCAD) with oversight from the Broward County Board of County Commissioners (BOCC). The Airport is located in southeastern Broward County, approximately 3 miles from downtown Fort Lauderdale and 2 miles from Port Everglades. FLL plays a vital role in the regional transportation system for accommodating aviation and airline passenger travel, as well as commercial and cargo operations. FLL is situated between Palm Beach International Airport (PBI), located 43 miles to the north, and Miami International Airport (MIA), located 27 miles to the south. The Airport comprises approximately 1,770 total acres of land.

FLL is a large-hub commercial service airport serving both domestic and international markets. The Airport presently has two runways, four passenger terminals, three public parking garages, including one consolidated rental car facility, among other facilities and amenities that collectively serve the traveling public. The Airport also has multiple tenants that include airlines, federal agencies, rental car providers, support companies, fixed-base operators, private/ corporate aircraft storage facilities, general aviation aircraft sales, maintenance service providers, and cargo operators.

A master plan provides a guide for efficiently accommodating aviation demand throughout a planning horizon, while preserving the flexibility necessary to respond to a continually evolving industry. The Master Plan Update (MPU) for the Airport was initiated in October 2015. The MPU has been funded with a combination of Federal Aviation Administration (FAA) and Florida Department of Transportation (FDOT) grants, along with airport revenues, and represents a roadmap for implementing recommended airport improvements necessary to serve demand and enhance customer service during the next 20 years and beyond, in an incremental and financially affordable manner. The MPU will help define the next chapter for FLL as it continues to elevate the customer experience while fulfilling the air and multi-modal transportation needs of Broward County and the South Florida Region.

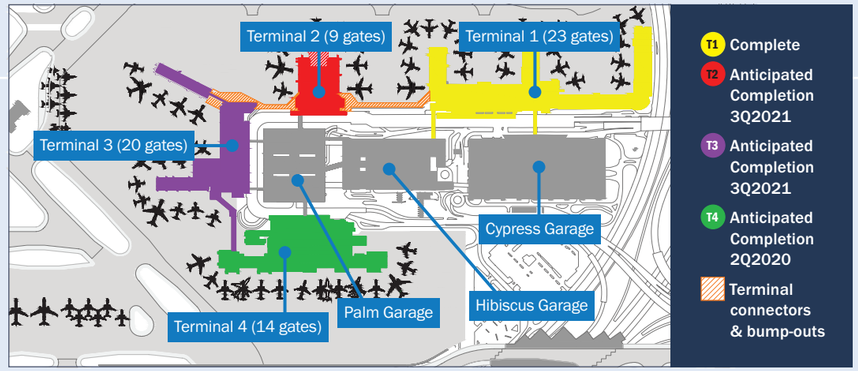
This executive summary provides an overview of data collected, assumptions, technical analyses, findings, conclusions, and recommendations from the MPU. Additional detailed information related to the MPU is available in the complete report. Projects will be implemented based upon demand growth and facility or infrastructure needs, funding opportunities, and affordability. Most proposed aviation-related development at FLL will be paid by federal or state grants and airport generated revenues. Third party funding on some projects may also be considered.




**SOURCE:** Ricondo & Associates, Inc., September 2019.



**Terminal Modernization Programs**




**SOURCES:** Broward County Aviation Department, May 2019; Ricondo & Associates, Inc., May 2019.

## 1.1 FLL BASELINE CONDITIONS

Since completion of the last master plan in 2010, significant economic and aviation industry changes have affected operational needs and capital investments at the Airport. Some of these changes include the following:

- Growth of Low-Cost Carriers (LCCs) and Ultra-Low-Cost Carriers (ULCCs) offering lower fares to passengers, stimulating travel decisions and providing new nonstop flights to secondary airports.
- Continued growth of the national economy and airline industry after the financial crisis in 2008.
- Consolidation of the domestic airline industry, with numerous mergers transpiring among both legacy and LCCs, including United Airlines-Continental Airlines, American Airlines-U.S. Airways, and Southwest-Air Tran Airways.
- Introduction and growth of transportation network companies (TNCs), such as Uber and Lyft, that are causing an ongoing shift in ground transportation demand characteristics and fluctuations in the volumes and sources of Airport revenues.
- Rapid and ongoing advancement of smart technology resulting in increased expectations for customer experiences.

In addition to these events, FLL has experienced significant growth in passengers and airline activity since the previous master plan. Passenger enplanements increased from 12.0 million in fiscal year (FY) 2014 to 17.7 million in FY 2018, an increase of 48 percent. Operations increased from 254,683 in FY 2014 to 329,874 in FY 2018, an increase of 30 percent.

FLL has undertaken a considerable number of projects and enhancements to the airfield and terminals since the completion of the 2010 MPU. For the purposes of this MPU, a baseline condition is established that is reflective of both existing conditions and on-going capital improvements. Some of these other larger-scale projects and enhancements include, but are not limited to the following:

- **South Runway Expansion (completed) –** Reconstruction and extension of Runway 10R-28L, which converted it from a limited general aviation runway to a longer runway capable of serving commercial airline aircraft operations. In addition to widening and extending the South Runway, the project included the decommissioning of Runway 13-31 and the reconfiguration of the cross-field taxiway system.
- **Noise Mitigation Program (completed) –** This completed program provided adjacent residents living within the 65+ DNL noise contour the option to participate in either the Voluntary Residential Sound Insulation Program or the Voluntary Sales Assistance Program in order to mitigate the impact of noise from aircraft.

- **Terminal Modernization Programs –** The Terminal Modernization Program includes expansion of Terminals 1 and 4, as well as improvements throughout all 4 terminals including new and/or renovated concessions, restrooms, amenities, lobbies, and passenger processing and circulation areas. Baggage systems and security-screening areas have also been renovated or consolidated as part of the program. Upon completion, FLL will have 66 total contact gates in operation.
- **North Airfield Rehabilitation –** In June 2019, BCAD initiated a major rehabilitation of the North Airfield. This project includes the reconstruction of the keel portion of Runway 10-28R (north runway) and an asphalt mill and overlay of the remaining portions. It also includes various geometrical modifications to Taxiway A, B, and connectors to and from the north runway to support aircraft maneuvering based on current FAA design standards.

While the improvements undertaken since the last Master Plan have provided significant capacity and operational enhancements for FLL, additional capacity and airport improvements are still needed. The high growth patterns experienced at the Airport, coupled with changing patterns in traveler characteristics and modes of transportation to and from the Airport have created unique needs and accentuated the necessity for identifying further improvements for FLL.

# 2 The Master Plan Process

The FAA recommends airport master plans be updated every five years or as necessary to verify the Airport's compatibility with aviation industry trends and local area development. The MPU was completed in accordance with FAA and FDOT guidelines, which include the required study elements to develop a comprehensive airport plan that meets the aviation demand for a 20+ year planning period in an incremental, demand-driven and affordable manner. The development of the MPU was guided by the goals and objectives illustrated on the right.

The MPU began in November 2015 and the aviation activity forecasts were approved by the FAA in January 2017. The final technical analysis for the MPU was completed in Summer 2019. After review by stakeholders and acceptance by the BOCC, the final technical report and an Airport Layout Plan (ALP) drawing set were completed in Fall 2020.

**2020 Master Plan Goals and Objectives**

**BALANCE**
Airfield/terminal/landside/airspace

**RESPOND**
To immediate and near-term needs

**POSITION**
For future growth and new opportunities

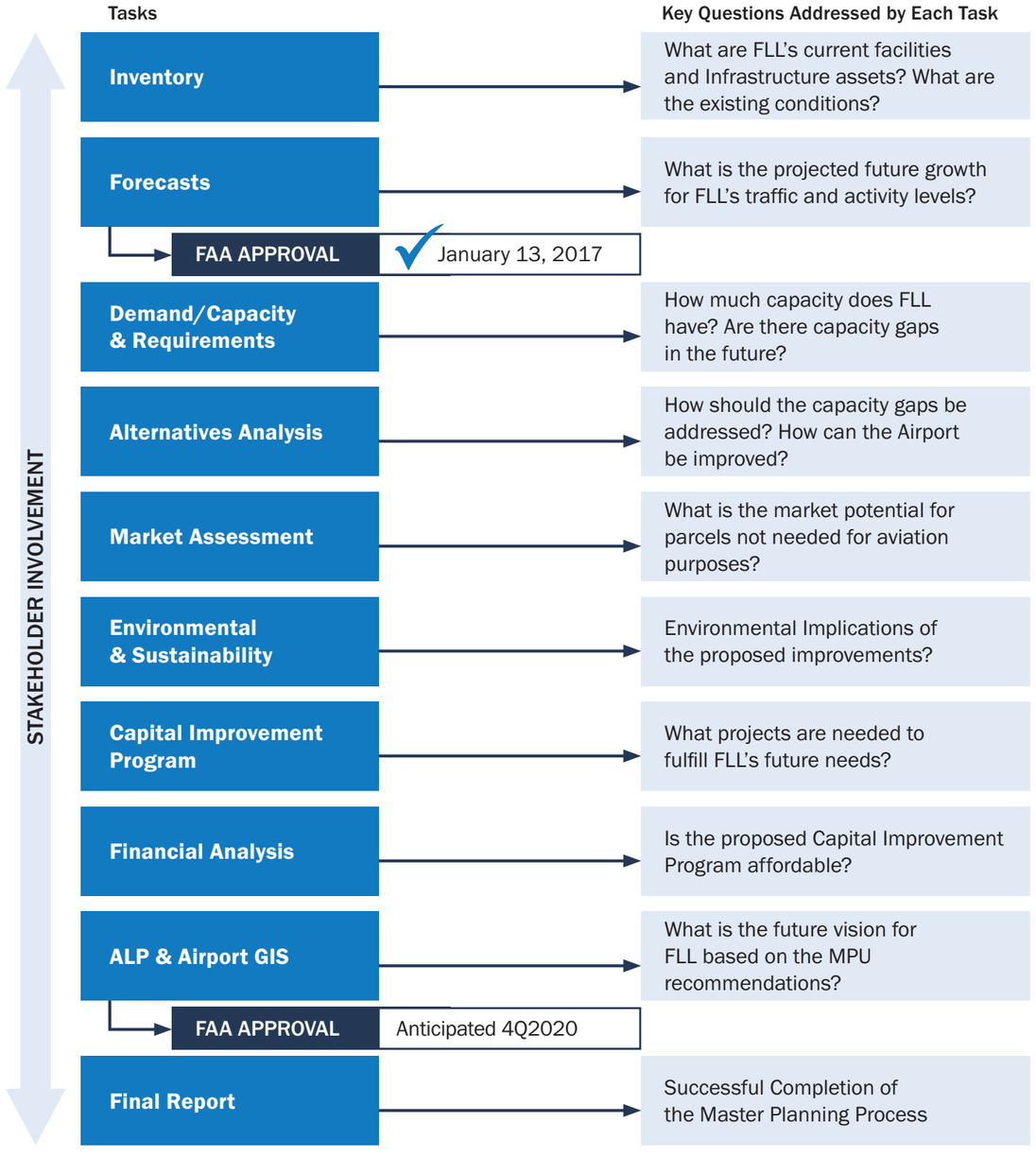
**ENHANCE**
Customer experience and connectivity

**OPTIMIZE**
Land assets and recent investments

**PRESERVE**
FLL's Identity and Strengths
- Broward County's Asset
- Economic Engine
- Easy In, Easy Out
- Low Cost, High Efficiency

**SOURCES:** Broward County Aviation Department, March 2017; Ricondo & Associates, Inc., September 2017.

**The Master Planning Process and Sequence of Tasks**




**SOURCES:** Federal Aviation Administration, Advisory Circular 150/5070-6B, Airport Master Plans, January 27, 2015; Ricondo & Associates, Inc., March 2017.

# 3 Future Airport Activity Projections

Future airport activity projections were developed for passengers and operations through 2035. The future airport activity projections provide the basis for determining facility requirements and defining future Airport needs, as well as for conducting the environmental, financial, and other analyses necessary for preparing the MPU.

Two forecasts were developed for the MPU that represent a range of possible activity at FLL. These are referred to as baseline and accelerated baseline forecasts. The baseline forecast was developed predominantly based on analysis of historical activity and considered local and national socioeconomic factors, FLL's market share of South Florida's demand for air service, and anticipated use by airlines. The accelerated baseline forecast builds upon these factors but also incorporates airline growth plans provided during discussions with multiple airlines operating at the airport as well as FLL securing a larger share of the South Florida market. Actual activity may vary from the forecasts due to factors such as a global recession or the lack of available facilities needed to support growth.

### Future Airport Activity Drivers

**Policy**
BCAD's goals and objectives

**Initiatives**
Air Carrier Service Development

**Air Service Trends**
Historic activity at the airport

**Local Trends**
Community, socioeconomic and demographic

**Global Trends**
International and domestic

**Market Share**
Economic dynamics among FLL, MIA, and PBI

## 3.1 ENPLANED PASSENGER FORECASTS

The term enplaned passenger relates to passengers departing from the Airport, whereas total passengers comprise both enplaned and deplaned (i.e., arriving) passengers. Forecasts for enplaned passengers were developed considering the following: historical activity, including passenger trends at the Airport and across the industry; trends and projections of local and national socioeconomic factors; and anticipated use of the Airport by airlines.

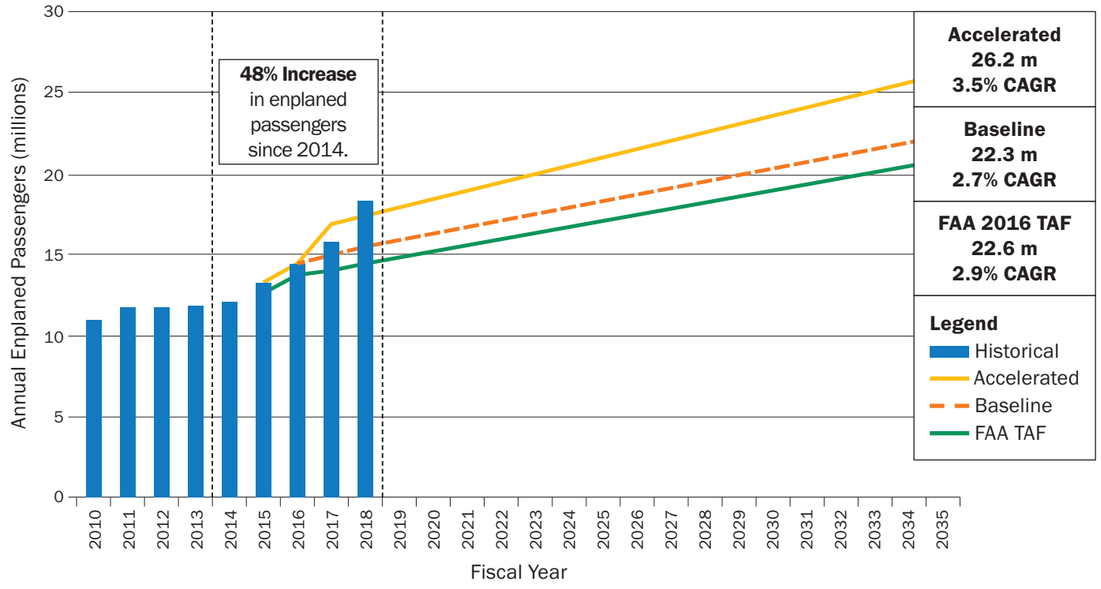
FLL's passenger levels have grown faster than most other large hub airports during the past few years. Between Fiscal Year 2014 and Fiscal Year 2018, FLL's passenger growth grew on average of 8.0 percent per year, more than twice the combined average growth of all other large hub airports.

During this same period, aircraft operations grew on average of 5 percent per year, more than four times the combined average of all other large hub airports.

FAA's independent passenger projections show FLL having the highest passenger growth among the large hub airports through Fiscal Year (FY) 2035. The MPU forecasts, approved by the FAA on January 13, 2017, established FY 2015 as the last year for historical activity and utilized FY 2016 through FY 2035 as the forecast period. The resulting forecasts reflect a doubling of the Airport's passenger activity between FY 2016 and FY 2035.

Total enplaned passengers are forecast to grow from 13.2 million in FY 2015 to 26.2 million in FY 2035, a compound annual growth rate (CAGR) of 3.5%.

**Enplaned Passenger Forecast**
Enplaned Passengers Represent Departing Passenger Activity only




**NOTES:**
(1) CAGR = Compound Annual Growth Rate. (2) TAF = Terminal Area Forecasts. (3) Total passengers equals two times enplaned passengers.
(4) Baseline forecasts estimate future airport activity predominantly based on trend analysis of historical activity, consideration of FLL's existing share of South Florida's demand for air service, socioeconomic data, and local/national trends.
(5) The Accelerated Baseline forecasts reflect higher growth at the Airport, particularly in the short-term based on discussions with several airlines operating at FLL regarding their growth plans, and the potential for FLL securing a larger share of South Florida's demand for air service.

**SOURCES:** Broward County Aviation Department (Historical); US DOT T100; Innovata; FAA Terminal Area Forecasts, January 2017; Ricondo & Associates, Inc., January 2017.

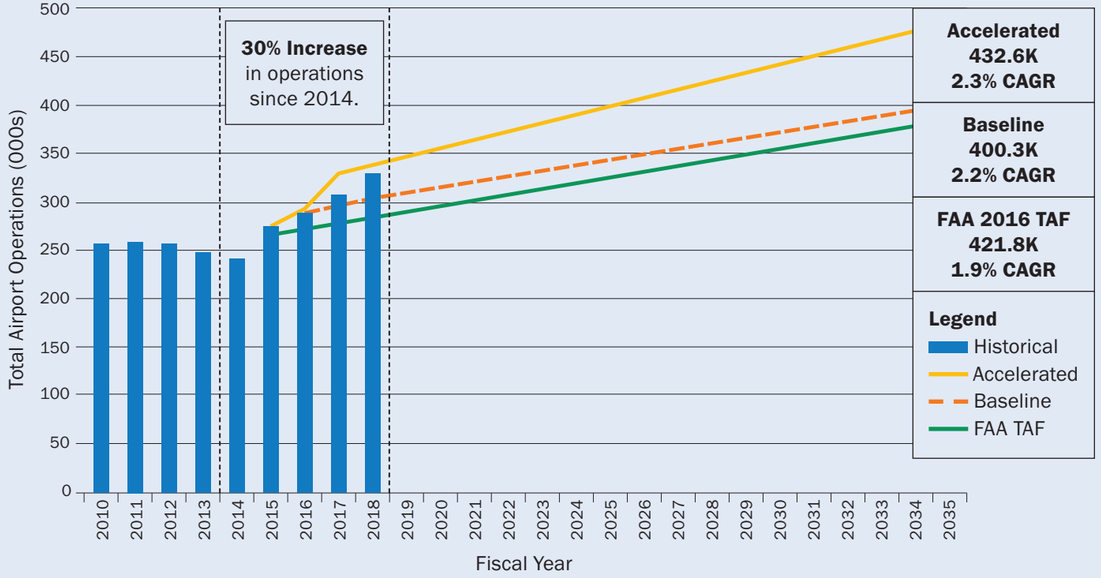
## 3.2 AIRCRAFT OPERATIONS FORECAST

The MPU forecasts for FLL approved by the FAA on January 13, 2017 also included forecasts for future aircraft operations activity at the Airport. An aircraft operation consists of an aircraft landing or departure. Aircraft operations are also expected to grow steadily during this same period (FY 2016 - FY 2035), but at a slower growth rate, indicative of a trend towards more modern aircraft possessing slightly larger passenger capacities operating to and from FLL. Separate forecasts were derived for air carrier, general aviation, all-cargo, and military operations.

Total aircraft operations at FLL are forecast to increase to 432,600 in FY 2035, representing a CAGR of 2.3 percent, and is based on the following:

- Air carrier aircraft operations are forecast to increase to 369,500 in FY 2035, representing a CAGR of 2.7 percent during this period.
- General aviation operations are forecast to increase to 41,300 in FY 2035, representing of a compounded annual growth rate averaging 0.5 percent.
- All-cargo operations are forecast to increase to 5,300 in FY 2035, representing a compounded average annual growth rate of 0.6 percent during this period.

**Aircraft Operations Forecast**




**NOTES:**
(1) CAGR = Compound Annual Growth Rate. (2) TAF = Terminal Area Forecasts. (3) Total passengers equals two times enplaned passengers.
(4) Baseline forecasts estimate future airport activity predominantly based on trend analysis of historical activity, consideration of FLL's existing share of South Florida's demand for air service, socioeconomic data, and local/national trends.
(5) The Accelerated Baseline forecasts reflect higher growth at the Airport, particularly in the short-term based on discussions with several airlines operating at FLL regarding their growth plans, and the potential for FLL securing a larger share of South Florida's demand for air service.

**SOURCES:** Broward County Aviation Department (Historical); US DOT T100; Innovata; FAA Terminal Area Forecasts, January 2017; Ricondo & Associates, Inc., January 2017.




# 4 Demand/Capacity Analysis and Facility Requirements

The realization of the future airport activity projections is dependent on the availability of the facilities and infrastructure needed to efficiently and effectively process passengers and aircraft throughout the airport campus, between the entrance to the Airport and the runway system.

Demand/capacity analyses determine the capacities of the existing airfield, terminal, landside, and various other airport support facilities relative to their capabilities for accommodating projected future demand. The results of the demand/capacity analyses set the framework for developing future strategies to develop the Airport in a responsible and cost-effective manner while accommodating forecast aviation activity at desirable levels of service. The demand/capacity analyses form the basis for the identification and assessment of development alternatives.

Requirements for future Airport facilities and infrastructure are defined for four key functional areas, illustrated on the right.

**Airfield**
Runways, taxiways, and apron

**Terminal**
Aircraft gates, holdrooms, and all the passenger and baggage processing systems located pre- and post-security screening checkpoints

**Landside**
Terminal curbfronts, access roadways, parking garages, rental car facilities, and other support facilities located between the entrance to the airport and the front doors for each of the terminals

**Nonterminal Area Support Facilities**
(Including Air Cargo and General Aviation)
Airport and airline support facilities

The Airport facilities that have been identified as needing immediate attention for serving growing passenger volumes are generally located within FLL's terminal area, comprising the Airport's unit terminals and associated landside facilities. Airport-wide capacity or space requirements needed to serve the projected 53 million total annual passengers (along with the corresponding ground transportation modes) and approximately 432,600 annual aircraft operations are summarized below:

**Terminal facilities:**
- Approximately 20 additional aircraft contact gates required
- Total Terminal Facilities Needed 474,300 square feet of building space

**Terminal curbfront capacity:** additional curbfront capacity (both levels)

**Roadway capacity:**
- Exit roadway east of Terminal 4
- Off-Airport
  - the exit segment from FLL towards the I-595 on-ramps
  - the I-595 Southbound off-ramp
  - U.S. 1 south of the Airport

**Automobile parking facilities:**
12,800 – 17,760 spaces[1]

**Rental car facilities:** approximately 1.1 million to 1.2 million square feet of additional space

**FBO and GA facilities:**
- Additional 63,600 square feet of hangar space
- Additional 154,000 square feet of auto parking
- Additional 75,000 square feet of Customs and Border Protection apron

**Airline and airport support facilities:**
- Fuel farm:
  - two additional storage tanks
  - expanded operations and maintenance building
  - replacement/rehabilitation of much of the piping and associated fuel control systems
- Aircraft Rescue and Firefighting (ARFF): additional 6,700 square feet of building space
- New Air Traffic Control Tower
- Flight kitchens: new/additional 30,000 square feet of building space
- Aircraft maintenance: preservation of up to 15 acres of land to support airline or third party aircraft maintenance operations
- Airport maintenance: approximately 180,000 square feet of additional building space
- Airport police and security:
  - expanded public safety facilities
- New Centralized receiving and distribution facility

NOTES:
1 Public parking requirements illustrate range the of required parking spaces based on master plan parking requirements. This range is subject to fluctuation (up or down) based on a wide variety of current and future trends in ground transportation including the growth of transportation network companies (TNC) and autonomous vehicles.



# 5 Alternatives Analysis

The MPU's demand/capacity analysis, in conjunction with the guiding goals and objectives, identified not only the need for additional capacity, but other improvements, such as the replacement of aging infrastructure, as well as the introduction of new customer amenities at the airport. The MPU focused on the following functional areas for development:

- airfield
- terminal
- landside
- nonterminal area support facilities

The planning approach was customized to meet the unique needs of each functional area. Preferred alternatives were established for each functional area. In many cases, the preferred alternative was chosen following a long series of interactive work sessions including various members of BCAD's executive team. During these work sessions, open discussions relative to the location and configuration of future (additional) facilities or replacement facilities were undertaken. These interactive discussions comprised the advantages, disadvantages, and tradeoffs of placing facilities at various sites as well as the configurations and layout for the proposed facilities, from both operational and land use perspectives. In essence, these work sessions and consultant/BCAD discussions, relative to airfield, landside, and support facility alternatives substituted a more structured evaluation process like the one utilized for the MPU terminal concepts.

## 5.1 AIRFIELD ENHANCEMENTS

FLL's airfield is characterized by two parallel east/west runways and supporting taxiways with dual crossfield taxiways connecting the north and south airfields. This configuration has sufficient capacity to serve the 20-year projected growth in aircraft operations, per the demand/capacity analyses. However, three airfield enhancements have been identified for FLL as part of the MPU.


SOURCE: Ricondo & Associates, Inc., September 2019.

**Legend**
New Taxiway/Taxilane Pavement
Demolition
New Taxiway/Taxilane Centerline

1 **West Extension of Taxiway H –** Existing Taxiway H does not extend to the departure end of Runway 10R. The extension of Taxiway H to the west enhances ATC's ability to sequence aircraft departures from this runway.

2 **Relocation of Crossfield Taxiways –** The expansion of the passenger terminal complex to the west, including aircraft gates, remote aircraft parking, and the existing ARFF will require the relocation of Taxiway Q.

3 **Dedicated Taxilane to Serve West Parcel Development –** The construction of a dedicated apron edge taxilane parallel to, and immediately south of Taxiway C is proposed to offer greater bypass capabilities on Taxiway C and provide additional aircraft taxiing options serving the westside development parcels.

## 5.2 TERMINAL ALTERNATIVES

The terminal alternatives analysis considered a range of development concepts to meet demand forecast.

**Initial Range of Terminal Expansion Concepts**
The initial set of nine development concepts identified for the expansion of FLL's terminal area consisted of either remote satellite pier or linear pier concourses. All nine concepts, illustrated on page 13, sought to provide a 95-gate buildout that would be constructed in incremental phases of development. The 95-gate inventory was derived in the MPU as the number of gates that represents the practical terminal-to-airfield capacity balance. One of these concepts, Concept 7, proposes the extension of Concourse G to the east. The remaining concepts focus on the expansion of Terminals 3 and 4 to the west, with contiguous concourse piers or satellite concourses connected to Terminal 3 with overhead sky bridges designed to allow for aircraft movements underneath and containing either assisted walking systems (e.g. moving walkways) or an automated people mover system(s).

Concepts 1 through 5A, proposed constructing a remote satellite concourse west of Terminal 3. The remote concourse could be connected to the passenger terminal with either an underground walkway or elevated enclosed skybridges. The primary differences among the various satellite pier concepts are the layout of the terminal buildings, size and configuration of the airside apron, and the means of connectivity between the satellite concourse and Terminal 3.

The four remaining terminal expansion concepts, Concepts 5B through 8, consider constructing either one or two linear concourse piers that are contiguous with one of the unit terminals. The primary differences among the various linear concourse pier concepts are the configuration of the terminal buildings, the layout and alignment of the linear concourse piers, and the size and configuration of the airside apron.

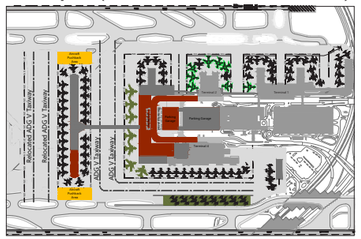
The various terminal expansion concepts were initially evaluated (screened) to establish a shortlist of concepts that would be subject to further refinement and evaluation. For this initial evaluation, the following screening criteria were established:

- **Balanced Capacity –** This criterion is used to assess whether the concept would provide adequate aircraft parking capacity within the terminal area (gates and remote parking) to serve the forecasted demand levels and allow for FLL to be in balance with the practical capacity of the airfield. The gate capacity that is estimated to represent the practical capacity of the airfield has been identified in the MPU to be approximately 95 gates.
- **Operational Considerations and Flexibility –** This criterion considered terminal building and taxilane layout, as well as gate capabilities and potential fleet mix.
- **Incremental Development Capability –** This criterion evaluates each concept's phased-development potential to build upon a previous phase and to provide incremental, demand-driven capacity with little or no throw-away investments.
- **Constructibility –** This criterion provided a relative comparison of the concepts as it relates to the construction complexity of each increment of phased of development.
- **Relative Total Capital Costs to Other Concepts –** This criterion considers the relative capital costs associated with each terminal expansion concept.
- **Expandability –** This criterion analyzed the opportunities for future expansion beyond the 20-year planning horizon.

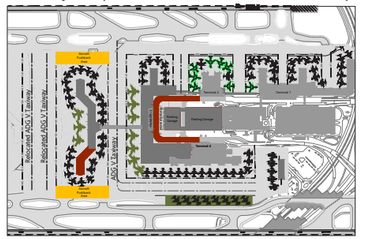
Three terminal concepts were shortlisted as candidates to be carried forward for further refinement and evaluation:

- Terminal Expansion Concept 1
- Terminal Expansion Concept 5B
- Terminal Expansion Concept 6

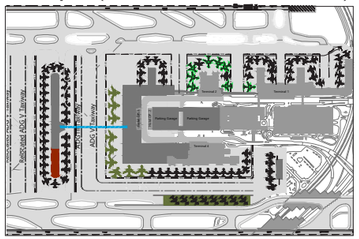
Concept 1 (Remote Satellite Concourse)



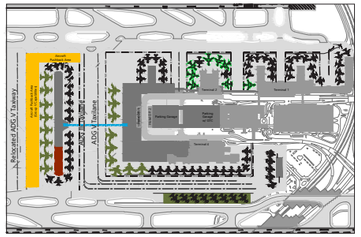
Concept 2 (Remote Satellite Concourse)



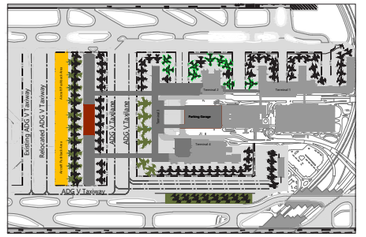
Concept 3 (Remote Satellite Concourse)



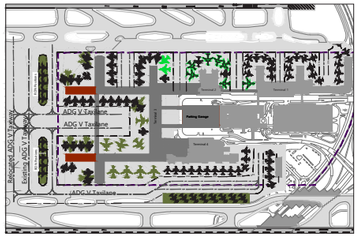
Concept 4 (Remote Satellite Concourse)



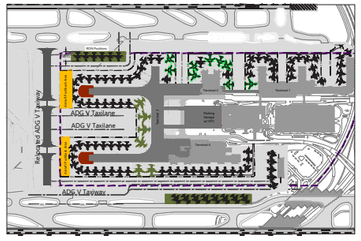
Concept 5A (Remote Satellite Concourse)



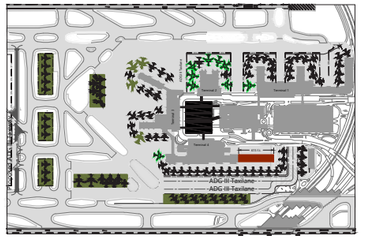
Concept 5B (Linear Concourse Pier)



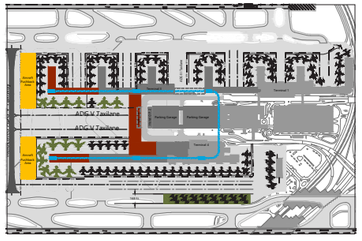
Concept 6 (Linear Concourse Pier)



Concept 7 (Linear Concourse Pier)



Concept 8 (Linear Concourse Pier)



**Legend**

- Existing Terminal/ Buildings/Structure
- Proposed Terminal/Buildings/ Structures - Planning Activity Level 3
- Proposed Terminal/Buildings/ Structures - Ultimate
- Aircraft Pushback Area
- Remote Aircraft Parking Area
- Widebody/Jumbo Aircraft
- Narrowbody Aircraft
- Automated People Mover

**SOURCE:** Ricondo & Associates, Inc., April 2017.

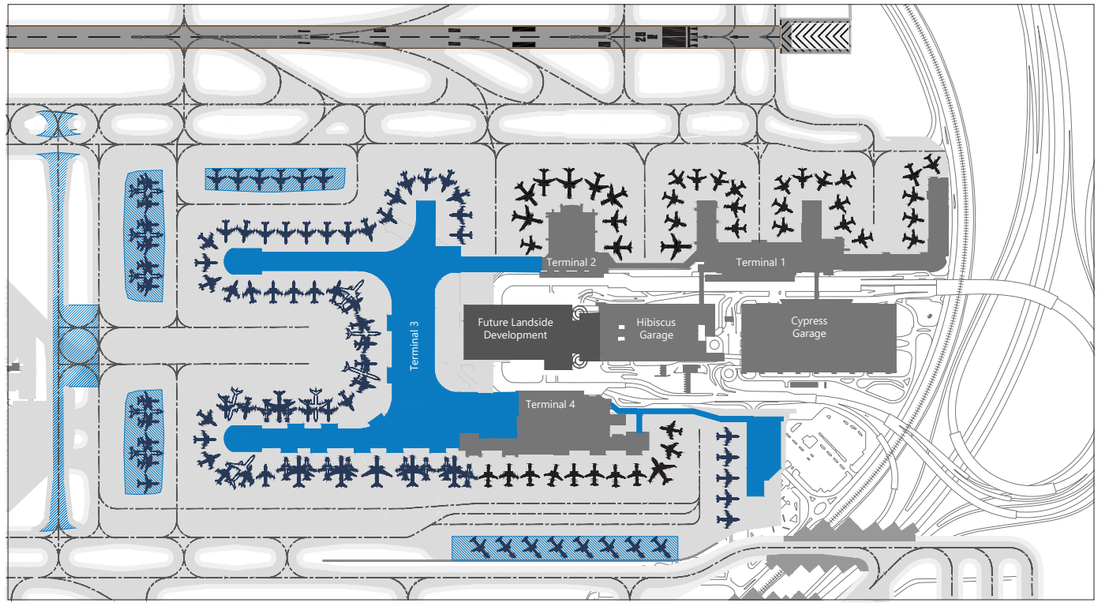
**Selection of a Preferred Terminal Expansion Concept**

The three shortlisted terminal expansion concepts were further refined to provide a more detailed understanding of the operational characteristics including the size of facilities and spaces, passenger flows, baggage processing systems, and the disposition of aircraft gate positions. A financial analysis of the capital, operating, and maintenance costs for each concept was also prepared. The results of the refined operational characteristics and financial analysis evaluation favored Concept 6 for the following preliminary reasons:

- Cost and ease of concept construction (phasing)
- International arrivals gate opportunities provided by a larger number of domestic/international swing gates
- Operational efficiencies for baggage conveyance
- Efficiency of aircraft movements

The shortlisted concepts, along with the aforementioned analyses, were presented to the Airline and Airports Affairs Committee (AAAC) on May 9, 2018 and the BOCC on May 15, 2018. The preference for Concept 6 was unanimously confirmed by both the AAAC and BOCC.

**Concept 6 (Linear Concourse Pier)**



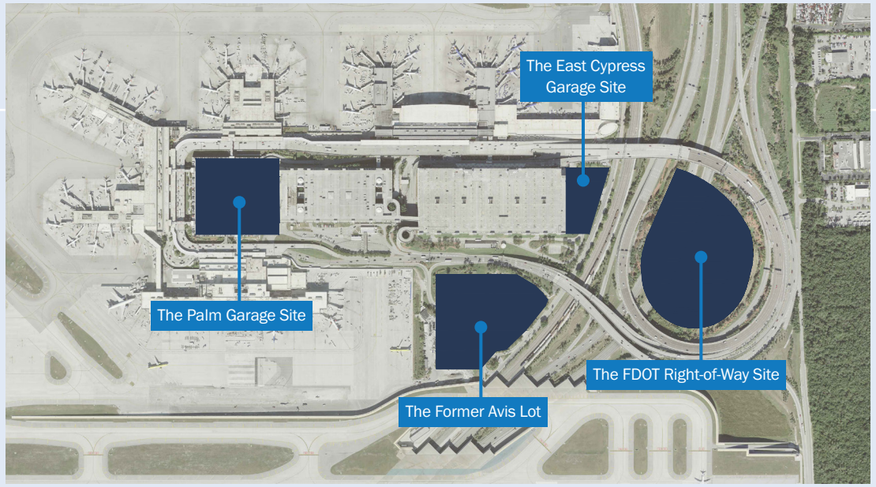

**Legend**

- Existing Terminal/Buildings/Structure
- Proposed Terminal Building
- New Taxiway & Aircraft Overnight Parking
- Future Landside Development

*Future landside development and Terminal 5 as depicted in the above graphic are discussed in detail in section 6.

**SOURCE:** Broward County Aviation Department, Fort Lauderdale-Hollywood International Airport, Airport Layout Plan, February 2011; Ricondo & Associates, Inc., March 2016.






**SOURCE:** Ricondo & Associates, Inc., September 2019.

**Legend** Landside Functions/Ground Transportation/Parking Opportunity Site

## 5.3 LANDSIDE ALTERNATIVES (ROADWAYS, CURBFRONTS, PARKING, AND APM)

Various roadway, parking, and landside connectivity alternatives were developed that satisfy the Airport's immediate needs as well as the long-range requirements. The landside alternatives include Airport access and exit roadways, terminal curbfronts, public parking facilities, and an automated people mover system (APM). The following screening criteria were established to evaluate these alternatives:

- Integration with other planned improvements for terminals and regional access/nonaviation development
- Conformity to design standards, continuity of operations during implementation phasing
- Rough Order of Magnitude (ROM) costs
- The assessment of capacity and operational benefits for each alternative completed using a dynamic simulation model prepared for FLL's landside area as part of the MPU
- BCAD feedback during planning charettes/ work sessions

**Public Parking Needs Opportunities**

The Demand/Capacity Analysis identified a need of approximately 12,800-17,760 public parking spaces. The reason for this range is to protect for potential impacts and uncertainties surrounding ground transportation trends specifically with the growth of TNCs, autonomous vehicles, and mass transit connectivity. Currently FLL has 10,945 public parking spaces which creates a parking deficit between 1,855-6,815 spaces. To accommodate anticipated future parking needs a variety of sites were considered for their suitability for development of expanded parking.

- **The Palm Garage site –** The site of the existing Palm Garage and adjacent spaces was identified for redevelopment for public parking, ground transportation, and commercial development. The redevelopment would expand landside and parking capacity via vertical development to provide additional parking spaces and a Ground Transportation Center (GTC). The reconfiguration of the site is necessary to provide the required corridors for a supplemental curbside and APM system.
- **The Former "Avis Lot" site –** This site, located south of the Cypress Garage and east of Terminal 4, was identified for potential landside uses. However, access to and from the site is limited.
- **The East Cypress Garage site –** The parcel to the east of the Cypress Garage was identified as

a strategic expansion site that can serve future demand driven facility expansions for either the rental car center or public parking in the Cypress Garage.

- **The FDOT Right-of-Way site (aka Intermodal Center site) –** This parcel, originally defined in the 2009 Sunport Project Development and Environment Study (PD&E), was carried forward as a potential site for multi-level, structured landside development with a focus on Airport and regional transportation integration, though the Airport does not currently own the land.

Three different parking development scenarios were identified and include varying degrees of development for each of the following facilities, Redeveloped Palm Garage, Intermodal Center (IMC), and parking opportunities on the former "Avis lot." Based on the previous screening criteria, the preferred alternative selected includes structured public parking facilities on the Palm Garage and the IMC sites and protects for demand driven parking or landside support development on the former "Avis lot" and East Cypress Garage sites.

**Terminal Roadways and Curbfronts**

Three terminal area roadway improvements were recommended to address the forecasted activity levels and reduce current or anticipated congestion areas:

- **Ground Transportation Center (within the ground level of the redeveloped Palm Garage) –**
  To maximize the uses within the Redeveloped Palm Garage a ground level GTC is introduced which provides dual loaded curbfronts for commercial vehicle operations that channel arriving and departing passengers through the recommended commercial center.
- **Supplemental Arrivals Roadway and Terminal Curbs –** Provides a new lower level roadway to route traffic to the Redeveloped Palm Garage/ GTC and constructs supplemental arrival curbfronts at each of the four terminals.
- **Westward Expansion –** Extends existing arrivals and departures level roadway by ultimately redeveloping Terminal 3 to the west, thereby providing additional curbfront capacity for long-term demand.
- **Exit Roadway Enhancements –** This concept was developed to minimize merging and weaving movements of egressing traffic, while adding capacity to the on-airport exit roadway system.

**Automated People Mover (APM)**

The construction of an Automated People Mover (APM) was identified as a project to provide an improved level of service by minimizing passenger walking distances, provide seamless connectivity between terminals and landside facilities, and enable BCAD to serve increased landside demand. The introduction of an APM at FLL promotes airport-wide connectivity through stations (up to seven) located adjacent to the terminals and parking garages and provides connectivity to the planned (IMC). The APM system will operate on an elevated dual-lane guideway with an initial offline Maintenance and Storage Facility (M&SF) located on Airport property. One of the primary initial planning parameters was to maximize system utility through station locations that are convenient for passenger connectivity and long-term system modification capability to provide connectivity to other (existing or proposed) in-line facilities. Throughout the master plan process this concept was refined in coordination with BCAD staff and stakeholders.

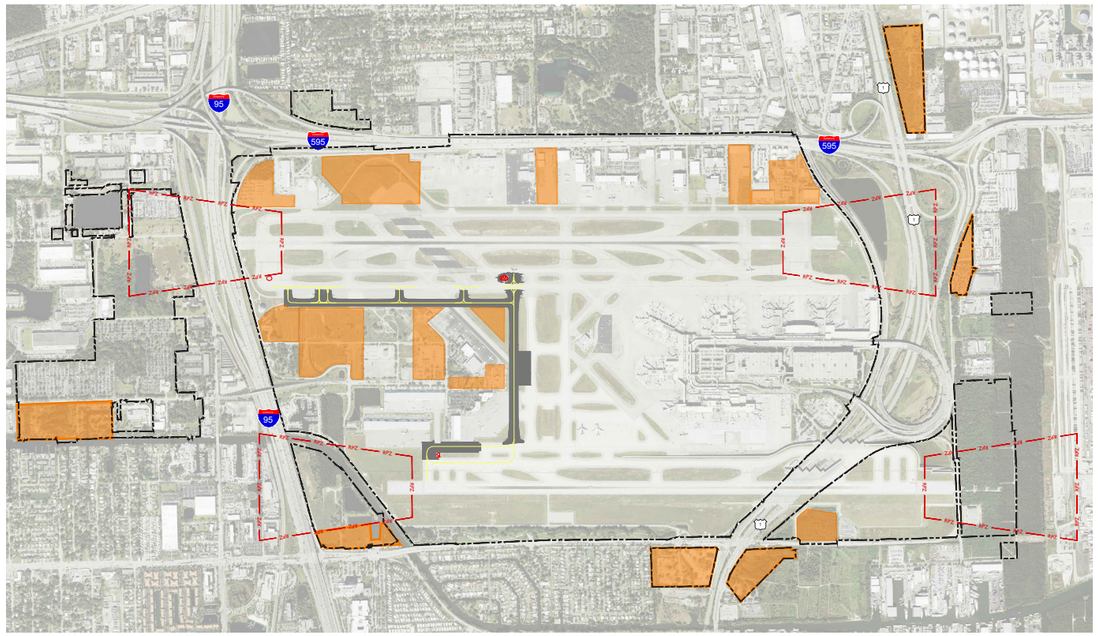


## 5.4 NONTERMINAL AREA DEVELOPMENT

Nonterminal area development includes potential development sites for Airport/Airline support operations, general aviation, cargo, and aeronautical/nonaeronautical activities. These development areas are intended to compliment the airfield, terminal, and landside concepts previously discussed. The nonterminal areas highlighted in orange below were identified as potential sites for the following functions:

- General Aviation/Fixed-Base Operator
- U.S. Customs and Border Protection
- Centralized Receiving and Distribution Facility
- Belly Cargo Expansion
- Other Aeronautical Developments
- Air Operations Area – Access Gate
- Fuel Farm Expansion
- Airport Maintenance
- Public Safety Facility
- ARFF
- Flight Kitchens

Various BCAD owned parcels were identified as expansion, and/or redevelopment parcels to accommodate the support facility needs listed above. The planning team conducted a workshop with BCAD staff to define the prioritization of uses for each parcel identified below. The preferred development layout associated with each parcel is discussed and illustrated in Section 6.




**SOURCE:** Ricondo & Associates, Inc., September 2019.

**Legend**

- Airport Property Line
- Runway Protection Zone (RPZ)
- Potential Nonterminal Support Parcel

**SOURCES:** Illustrate My Design, LLC, March 2019; Ricondo & Associates, Inc., March 2019.

# 6 Preferred Airport Development Plan Overview

Based upon the results from the future airport activity projections, demand/capacity assessments and identification of facility requirements, and alternatives analysis, a preferred airport development plan was identified. This plan is described over the next few pages and culminates with the exhibit on page 27. The elements illustrated on this exhibit are also used on the future Airport Layout Plan (ALP) for FLL which will be submitted to the FAA for approval. A current and approved ALP depicting the existing and planned development is a prerequisite for the issuance of federal grant.

## 6.1 PREFERRED LONG-TERM TERMINAL AREA DEVELOPMENT PLAN

As previously noted, Terminal Expansion Concept 6 was selected as the Preferred Concept for the terminal area. The final buildout of Concept 6 results in an expanded terminal area envelope that is achieved by the westward relocations of the existing crossfield taxiway system, ARFF facility, and eventual redevelopment of Terminal 3, allowing the Airport's gate inventory to grow to approximately 95 gates. New gates are provided by two concourse piers west of Terminal 2, along with the expansion of Terminal 4 to the west. The resulting "H" configuration aligns gate clusters north and south of Terminal 3 that effectively align with FLL's existing runway configuration.

The implementation of Concept 6 has been formulated to occur in phases, sequential in nature but each providing independent utility and allowing for the individual development of each phase as demand, financial conditions and other factors dictate. A high-level summary of these development phases is provided in Section 7, Program Implementation Phasing.

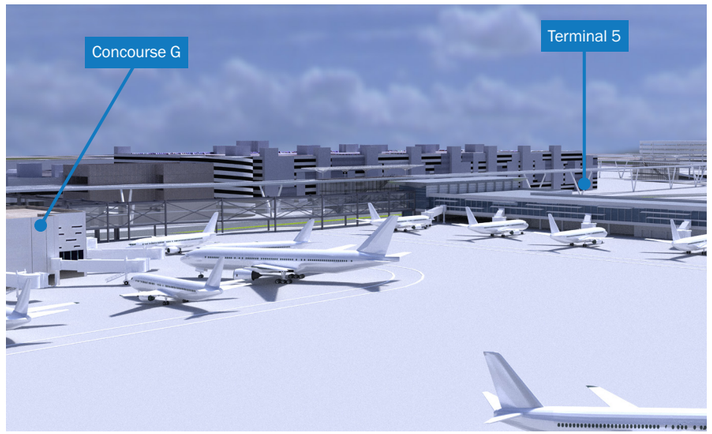


**Terminal 5 (Formerly referred to as 5-Gate Terminal)**

A new 5-Gate domestic only Terminal (Terminal 5 or T5) is recommended as part of the MPU, located east of Terminal 4/Concourse G on a portion of existing apron that currently provides overnight aircraft parking and Ground Service Equipment (GSE) storage. Terminal 5 consists of a two-level structure, with passenger amenities and holdrooms located on the second level. The lower ramp level would house the building's support spaces, concessions storage, and airline operations functions. The area informally referred to as the Avis Lot would provide ground support area needed for Terminal 5 roadways and curbsides. The following key facility components are associated with Terminal 5:

- Multi-level pedestrian connector providing a post-security connection from Concourse G to Terminal 5 on the concourse level. Additionally, nonsecure pedestrian connectors from Terminal 4, the parking garages and an APM station to Terminal 5 are protected on a mezzanine level.
- An apron depth to support five narrowbody aircraft or three narrowbody aircraft and a single widebody position.
- Airfield Access Gate 504 to provide more direct airside access to the south airfield.

**Terminal 5 (Airside View)**




**SOURCE:** Ricondo & Associates, Inc., May 2019.

**Terminal 5 (Landside View)**


**SOURCE:** Ricondo & Associates, Inc., May 2019.

- A landside roadway system including curbside for passenger pick-up, drop-off and commercial vehicle operations.
- New aircraft overnight parking area adjacent to the South Runway retaining wall to replace the four existing spaces displaced by the facility and provide an additional four spaces to meet anticipated demand.

## 6.2 PREFERRED LANDSIDE AND GROUND TRANSPORTATION PLAN

Increasing FLL's landside capacity and the addition of new airport access systems (signalized pedestrian crossings, curb and parking improvements, Cypress Garage and Airport exit roadway modifications) are key aspects of the MPU's recommendations. The long-term redevelopment of Terminal 3 to the west, included in Terminal Expansion Concept 6, allows for the expansion of the terminal curbs, access roads, and parking as needed. However, several other landside projects are proposed prior to the redevelopment of Terminal 3. Collectively, the following landside projects decongest the terminal area and provide the additional landside capacity needed to support development through the 95-gate buildout. These projects are:

- Redeveloped Palm Garage (including Supplemental Arrivals Curb and Roadway)
- Commercial Center and Airport Hotel
- Intermodal Center (IMC)
- APM
- Exit Roadway System

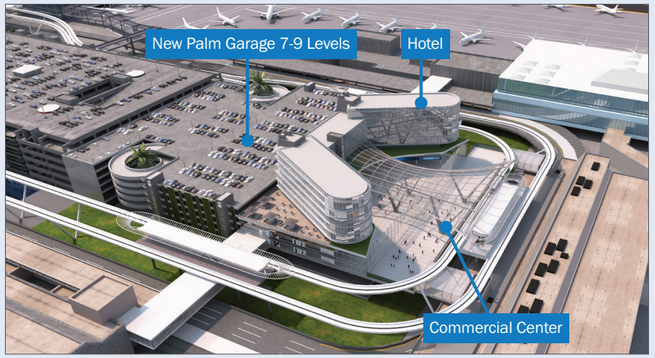
### Redeveloped Palm Garage (including Supplemental Arrivals Curb and Roadway)

The redeveloped Palm Garage is proposed to have seven to nine levels dedicated to public vehicular parking, providing approximately 3,500 to 3,700 parking spaces. The existing Palm Garage provides approximately 2,500 parking spaces. The redeveloped Palm Garage is contained within a smaller north/south footprint and further to the east, connecting to the Hibiscus Garage, which allows space for the supplemental curb to wrap around the facility. The supplemental curb and roadway reduces congestion on the lower level terminal roadway. It is also envisioned that the Palm Garage would have a GTC on the lower level. The third level will serve as a transfer level between the redeveloped Palm Garage and Terminals 2, 3, and 4.

### Commercial Center and Airport Hotel

The preferred landside development plan includes the construction of a commercial center and airport hotel. Phase 1 of this development, constructed in parallel to the redeveloped Palm Garage, features passenger amenities such as food and beverage, retail, and other entertainment spaces as well as passenger dwelling areas. As part of this development a 300-room hotel with on-site conference center space is included. A Phase 2 expansion of the Commercial Center to the west is protected for long-term development, following the redevelopment of Terminal 3.

### Redeveloped Palm Garage, Commercial Center and Hotel




**SOURCES:** Illustrate My Design, LLC, March 2019; Ricondo & Associates, Inc., March 2019.

### Intermodal Center (Phase 1)


**SOURCES:** Illustrate My Design, LLC, March 2019; Ricondo & Associates, Inc., March 2019.

### Preferred Landside and Ground Transportation Plan


**SOURCES:** Illustrate My Design, LLC, March 2019; Ricondo & Associates, Inc., March 2019.

### Intermodal Center

The IMC is envisioned to be an eight-level structure that integrates public transportation, vehicular parking and (as a potential option) commercial development. To gain a perspective of how much parking capacity could be incorporated into the IMC, a preliminary site plan for each level was developed. It was determined the IMC could be developed in two phases providing approximately 6,700 to 6,900 total parking spaces. The preferred alternative builds the IMC in a west to east phasing plan. The western portion over U.S. 1 is constructed in Phase 1, totaling approximately 4,500 parking spaces. The remaining eastern portion is constructed in Phase 2 and would provide an additional 2,200 to 2,400 parking spaces.

Level one of the IMC was planned to operate as a Regional Transportation and Transit Center to provide passenger connection to mass transit modes. Level two provides vehicular parking and includes vertical circulation to facilitate passenger access between level one and the upper level amenities. Levels three through five contains an APM platform, concessions and vehicle parking. Levels six through eight contains vehicle parking, a courtyard and leasable space that could serve potentially serve as office space or other amenities (to be confirmed/determined in future programming).

### Automated People Mover

The APM alternative was refined to provide a more detailed understanding of the operational characteristics and system connectivity. The alternative was refined in terms of implementation phasing, passenger connectivity, APM station locations (up to seven stations), M&SF location, and preliminary off-airport connectivity. During the refinement process, the Airport Circulator (representing Phase 1 of the APM Project) was determined to be implemented in three sequences. The three sequences are described below:

- **Sequence 1A –** Initial pinched loop system capable of operation prior to the demolition of the Palm Garage

- **Sequence 1B –** Completion of the closed loop APM circulator, which includes approximately 9,000 linear feet of bi-directional (two-way) guideway, enabled by the demolition of the Palm Garage
- **Sequence 1C –** Potential western extension for alignment with long-term redevelopment of Terminal 3

A long-term, off-Airport expansion is recognized and illustrated in the MPU to promote a larger connectivity plan between FLL, Port Everglades, and the Broward County Convention Center. This extension would require coordination with other Broward County departments and stakeholders given it is developed completely off BCAD-owned property.

**Exit Roadway System**

Redevelopment and expansion of the outbound terminal roadway system, east of Terminal 4, is anticipated to be needed to support the roadway and vehicular demands associated with the long-term (95-gate) facility buildout. This redevelopment will include the addition of vehicle travel lanes, modification to the ramps exiting the Airport, expansion of the bridge crossing U.S. 1, and expansion of the roadways east of U.S. 1 that provide functional connectivity for vehicle routing exiting the Airport. Significant coordination with FDOT will be required to refine the roadway layouts and programming due to much of this development occurring off-BCAD owned property.

## 6.3 NONTERMINAL AREA PLAN - SUPPORT FACILITIES

The preferred development plan for support facilities was chosen after considering future terminal development, landside development, and the best use of available airport property. Demand for support facilities is driven by airport needs, tenant preferences, funding opportunities, accessibility, utility access, and a variety of other factors. The preferred alternatives for support facilities were organized by the following locations:

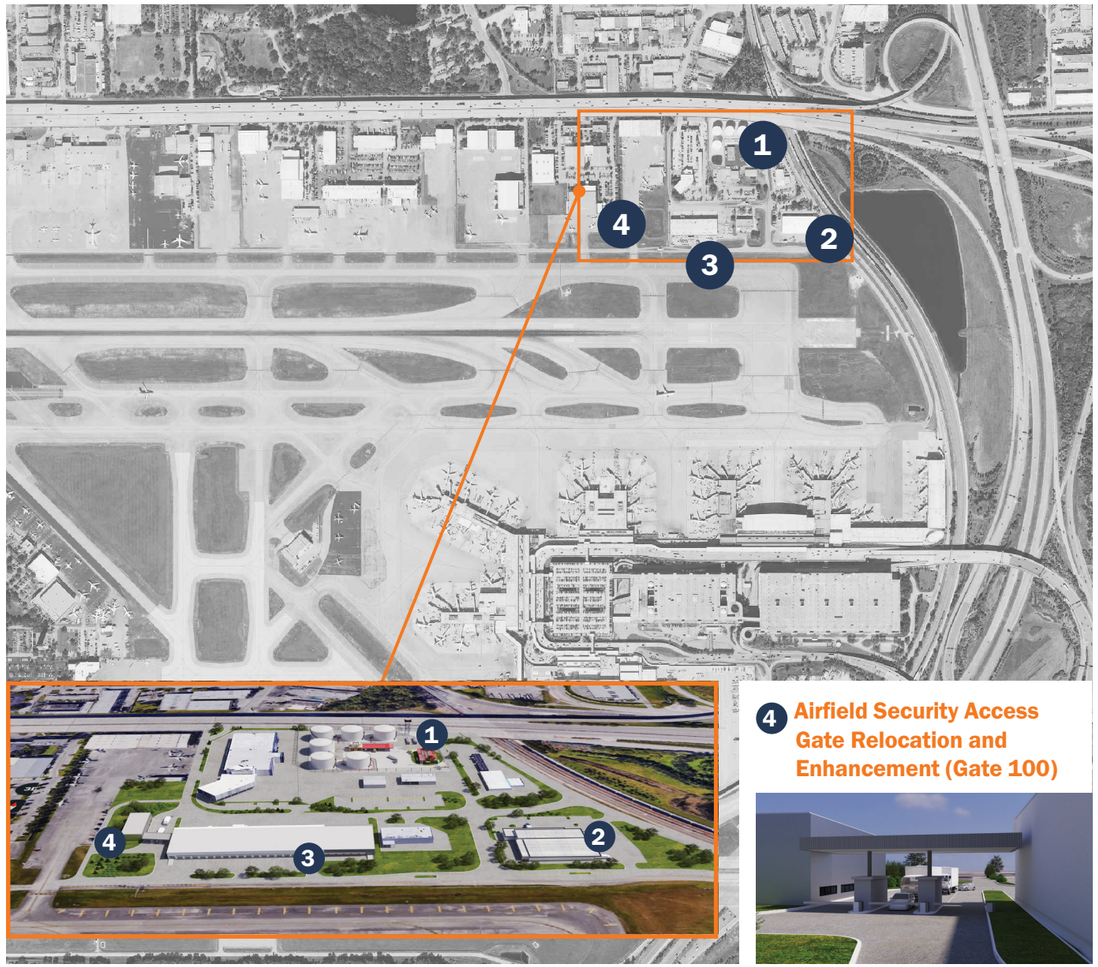
- North Airfield Parcels
- West Airfield Parcels
- Remote Parcels

**North Airfield Parcels**

The North Airfield Parcels are located between I-595 and Runway 10L-28R. These parcels have direct airfield access and are suitable for tenant-driven aeronautical development, such as GA development, air cargo activity, and Airport/Airline support facilities development. The Northeast Quadrant contains land suitable for various support facilities and is displayed in the following representative layout for illustration and visualization purposes only. The preferred alternatives are described below:

- **Fuel Farm Expansion (Short-term) –** Expansion of the existing fuel farm by adding two 1.5-million-gallon tanks on the existing fuel farm location. A long-term fuel farm expansion, containing three additional 1.5-million-gallon fuel tanks, would occur on the triangular parcel to the north if acquisition is possible. If acquisition of the triangular parcel is not possible, future long-term expansion can take place south of the existing fuel farm parcel with the relocation of existing maintenance facilities.
- **Centralized Receiving and Distribution Facility (Consumable Goods) –** The preferred alternative utilizes a parcel currently occupied by BCAD security which would be relocated to the BCAD Consolidated Operations Facility. This parcel is located along Perimeter Road with direct access to the airside access road and provides 20,000-30,000 square feet of warehouse space. This parcel contains the necessary infrastructure for a centralized receiving/distribution facility, including utilities and existing pavement that could potentially be repurposed.
- **Belly Cargo Facility Expansion –** This existing facility is currently fully utilized, however an expansion to the east is possible to provide approximately 15,000 additional square feet for expanded belly cargo capabilities.

**North Airfield Parcels and Representative Layouts (for illustration purposes)**




**4 Airfield Security Access Gate Relocation and Enhancement (Gate 100)**



**1 Fuel Farm Expansion (Short-term)**

**2 Centralized Receiving and Distribution Facility (Consumable Goods)**

**3 Belly Cargo Facility Expansion**

**SOURCES:** Illustrate My Design, LLC, March 2019; Ricondo & Associates, Inc., March 2019.

- **Airfield Security Access Gate Relocation and Enhancement (Gate 100) –** Due to the immediate need of traffic relief at this gate, and based on discussions with BCAD staff, an undeveloped parcel has been identified as the preferred location for the relocation of Gate 100. This site is west of the existing belly cargo building on an existing general aviation parcel. The relocated Gate 100 will provide five drive-through lanes with separate queues for badge holders and vehicles requiring inspection/escort.

Other north airfield parcels are protected to serve demand driven aeronautical development.

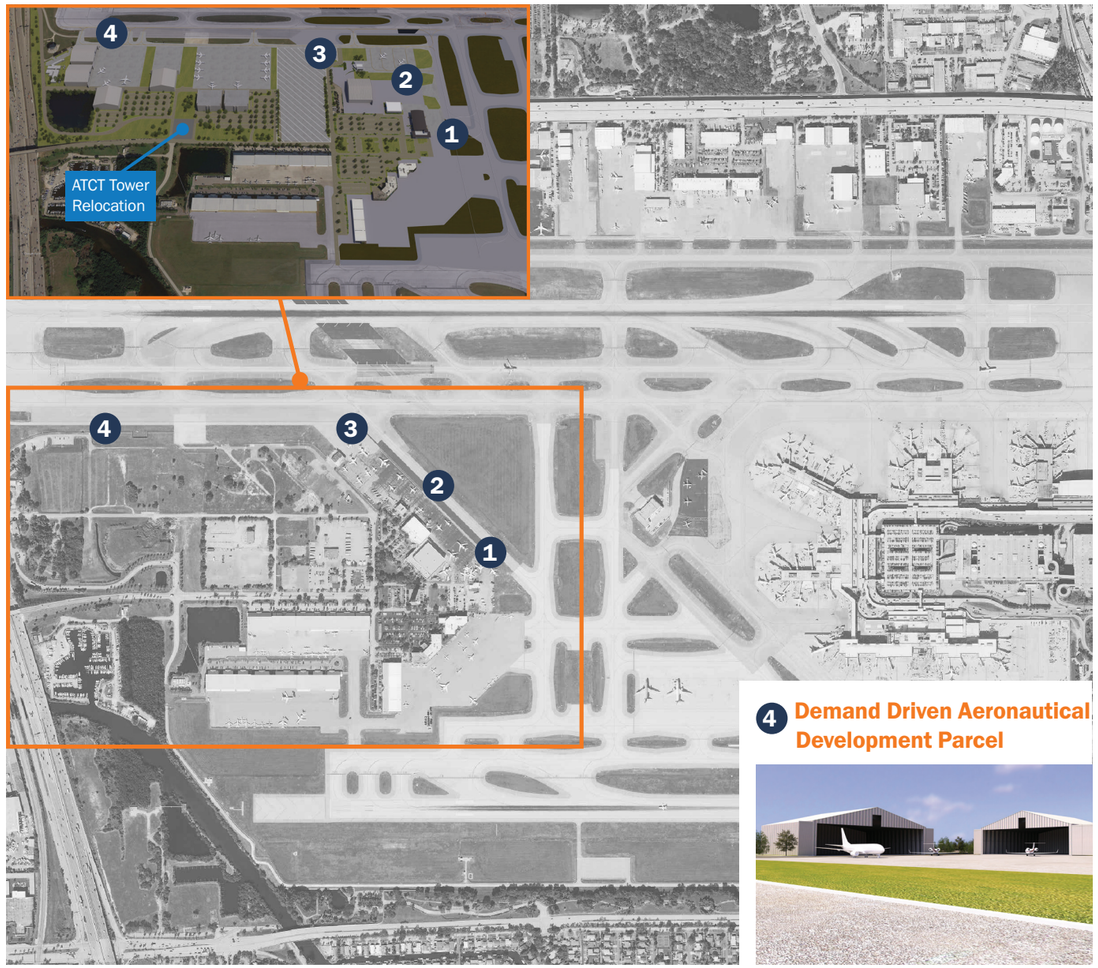
### West Airfield Parcels

The West Airfield Parcels are located between Runway 10L-28R and Runway 10R-28L on the west side of the airfield, as displayed in the following representative layout for illustration and visualization purposes only. Based upon BCAD and stakeholder input, these west airfield parcels were recommended for future GA development, demand-driven aeronautical development, future ATCT tower relocation, and a consolidated ARFF and Public Safety Building (PSB). As discussed in Section 6.1, an Airplane Design Group (ADG) III taxilane is recommended to reduce airfield congestion in the west airfield area. The west airfield preferred alternatives are as follows:

- **ARFF –** The existing ARFF facility will be displaced to accommodate Phase 2 of the preferred terminal alternative discussed in Section 6. The proposed location near the central portion of the Airport provided the best ARFF response time to the midpoint of each of the runways. This site also provides landside access to the facility which will remove some airfield vehicle traffic to and from the ARFF and ease access to the station.
- **BCAD Consolidated Operations Facility –** The credentialing office, Broward County Sheriff's Office (BSO), and the BCAD security offices are currently located in three different facilities on Airport property. To improve the efficiency and ease of operations, these functions will be ultimately consolidated into a shared-use BCAD Consolidated Operations Facility.
- **U.S. Customs and Border Protection (CBP) –** Based on its site configuration and centralized location, the site currently serving Pond K was selected as the preferred site for the relocated CBP facility. Users will access the facility by the proposed Airplane Design Group (ADG) III taxilane from the north. Once processed, the taxiing aircraft will exit the CBP apron onto the relocated crossfield taxiway. This development provides a 10,000-square-foot building as well as 75,000 square feet of apron to support up to a Boeing BBJ (737 variant) and three Gulfstream G-550 aircraft.
- **Demand Driven Aeronautical Development Parcel –** The preferred alternative development parcel meets the existing and future business needs. This parcel, east of I-95 and south of Taxiway C, would provide the opportunity for a greenfield development site to meet long-term needs. Aircraft would utilize the planned ADG III taxilane serving the westside parcels for primary site access.



### West Airfield Parcels




**1 Aircraft Rescue and Firefighting**

**2 BCAD Consolidated Operations Facility**

**3 U.S. Customs and Border Protection (General Aviation Facility)**

**4 Demand Driven Aeronautical Development Parcel**



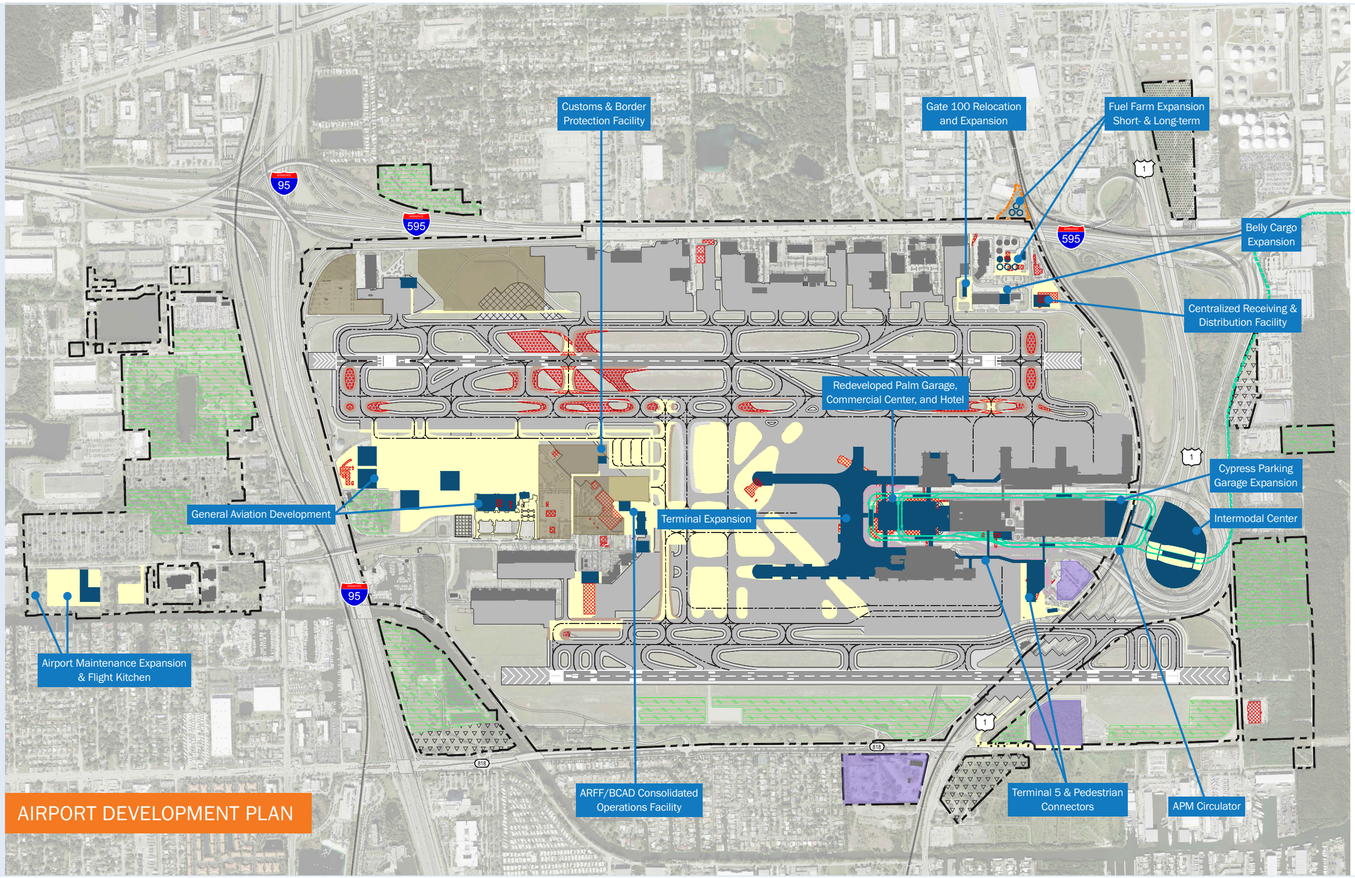
**SOURCES:** Illustrate My Design, LLC, March 2019; Ricondo & Associates, Inc., March 2019.

**Remote Parcels**
Airport-owned parcels that fall outside the contiguous Airport boundary are reserved for support facilities or functions that do not require direct airfield or terminal access and/or non-aeronautical development. It should be noted that this section does not include those remote parcels identified in the MPU as being required for stormwater management or those parcels that are currently occupied. Two support facilities have been identified as preferred uses for remote parcel development. They are:

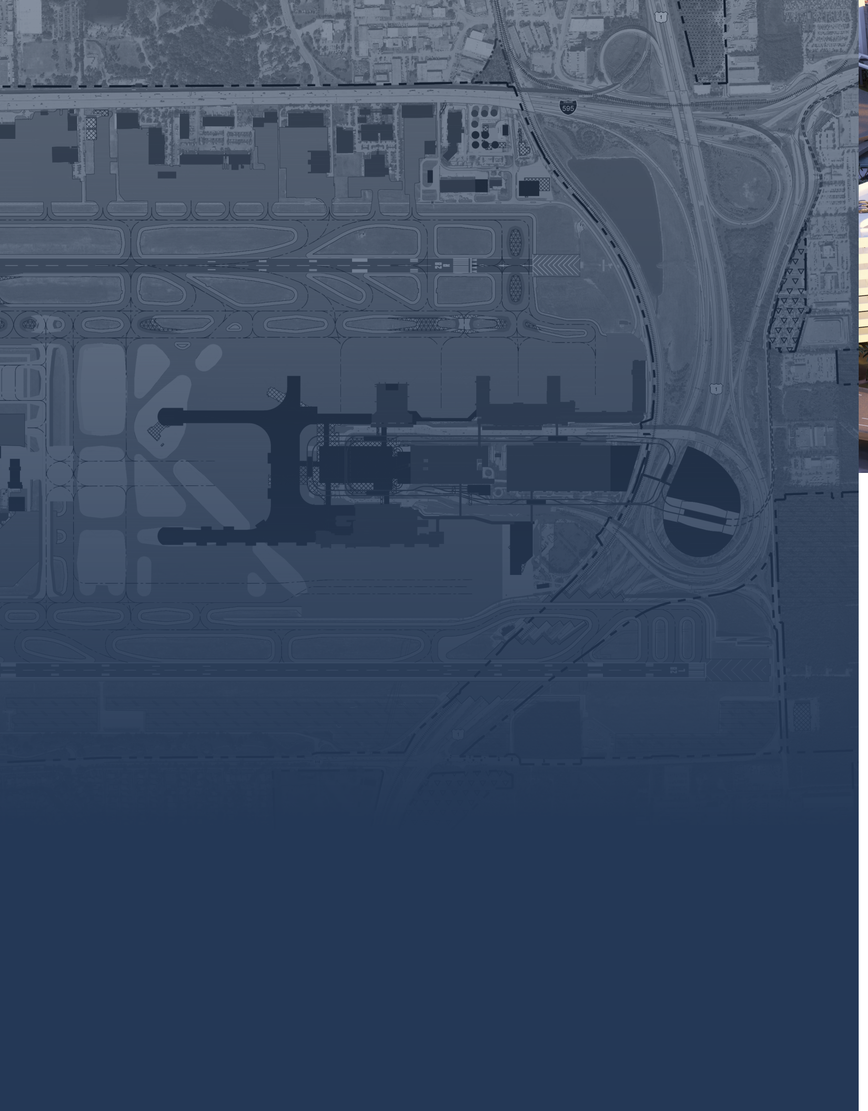
- **Airport Maintenance –** After discussions with BCAD staff, the preferred alternative was sited on a parcel west of I-95 and adjacent to the Animal Care Facility because it provides easy access from SW 42nd Street and has long-term expansion potential on adjacent BCAD owned property.
- **Flight Kitchens –** Flight kitchens provide food and beverage concessions to airlines and are often sited on non-contiguous or remote airfield parcels based on the nature of the operation and land requirements these facilities typical present. Transporting goods via perimeter road enables the opportunity for BCAD to site the flight kitchen on the remote westside parcel and further preserve land with direct airfield access for other developments. A preferred site was identified west of the proposed airport maintenance site that is capable of supporting a 30,000 sq ft flight kitchen facility and also provides convenient access via SW 42nd Street and Perimeter Road to the proposed centralized receiving and distribution facility.


## 6.4 AIRPORT DEVELOPMENT PLAN

The alternative analysis detailed in the MPU culminates with the preferred airport development plan which was identified after considering preferred airfield, terminal, landside, and nonterminal support facility development alternatives. The buildout of these various improvements would occur incrementally, based on demand triggers, funding opportunities, and financial affordability. The sequencing, outlined in Section 8 is intended to provide maximum flexibility and functionality for future implementation decision making.




**SOURCE:** Ricondo & Associates, Inc., September 2019.



SOURCES: Illustrate My Design, LLC, March 2019; Ricondo & Associates, Inc., March 2019.

# 7 Program Implementation Phasing

Phase 1 of the preferred airport development plan has been programmed to span approximately 10 to 14 years. Phase 1 begins with the construction of Terminal 5 and parking spaces (surface or structured) needed to mitigate the temporary loss of spaces that would occur when the Palm Garage is demolished. With the replacement parking in place, the demolition of the existing, four-level Palm Garage and the construction of a supplemental curb for Terminals 1, 2, 3, and 4 would commence. The arrivals level, supplemental curb will provide much needed capacity to one of the most congested areas of the Airport, the lower level curbs and roadway for the terminals. A supplemental curb for the departures levels is not proposed. Next, the redevelopment of the Palm Garage site would follow. This proposed redevelopment includes constructing a new 7- to 9-level Palm Garage, located adjacent to and connected with the existing Hibiscus Garage, along with a potential Commercial Center and Airport Hotel, estimated to have approximately 300 rooms and meeting spaces. The Commercial Center and Hotel would offer new retail, lodging, food and beverage, and dwelling options for airport customers.

Following these landside enhancements, the westward expansion of Terminal 4 and Concourse G (termed as the Phase 1 Terminal Expansion and Improvements) would be undertaken to increase FLL's gate capacity to 77 total gates, as included in the Record of Decision associated with the Environmental Impact Statement (EIS) for the South Runway Program. The westward expansion of Terminal 4 would provide approximately 800,000 square feet of additional terminal space.

The 77-gate inventory provided by the westward expansion of Terminal 4 and Concourse G includes the replacement of five Concourse F gates. The new gates being provided in Terminal 4 would be capable of serving domestic and international flights, as well as newer generation narrowbody or widebody aircraft.

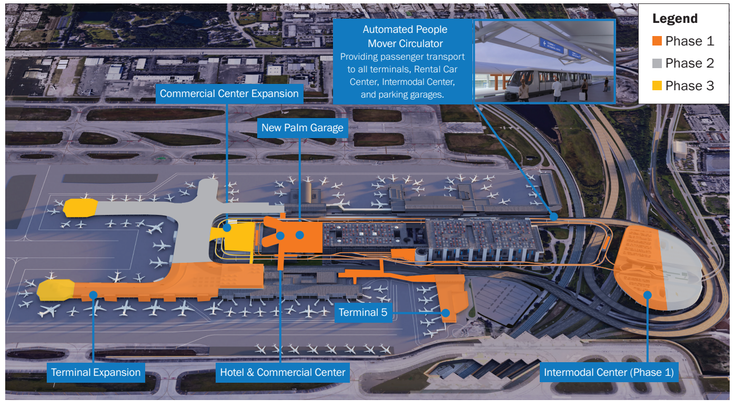
The terminal expansion would provide additional ticketing, baggage and security screening facilities, airport and airline support spaces, and a new Federal Inspection Services (FIS) facility capable of serving up to 3,500 passengers per hour initially, but programmed to allow for its future expansion if necessary.

Phase 2 comprises an incremental expansion to the extended Terminal 4, and the construction of the second phase of the IMC with approximately 2,200 to 2,400 parking spaces and an APM station within the IMC, connected to the Airport's easternmost APM station. Further gate expansion is achieved through the construction of a new concourse pier just south of existing Concourse E. A temporary passenger connector would be constructed between this new concourse pier and Terminal 3. The completion of this new concourse and passenger connector would allow for the decommissioning and demolition of Concourses E and F, followed by the construction of a north-south pier adjoining the east end of the previously constructed concourse. The final step in Phase 2 proposed the construction of frontal, wide body international gates and terminal processing space to the west of existing Terminal 3, resulting in an interconnected 85-gate terminal complex.

Phase 3 represents the redevelopment of Terminal 3 approximately 375-475 feet further to the west, and the expansion of the landside facilities, including the terminal roadway, curbs, Commercial Center and parking as needed to continue serving passenger growth. An additional 10 gates may be quickly activated by constructing "hammerheads" at the western ends of the newly built concourses, resulting in a 95-gate buildout.

Each phase represents demand driven, incremental units of development with independent utility to be implemented as demand, financial, and local conditions dictate, with prior BOCC approval.

**Vision for FLL that Protects the Airport's Growth for 30+ Years**



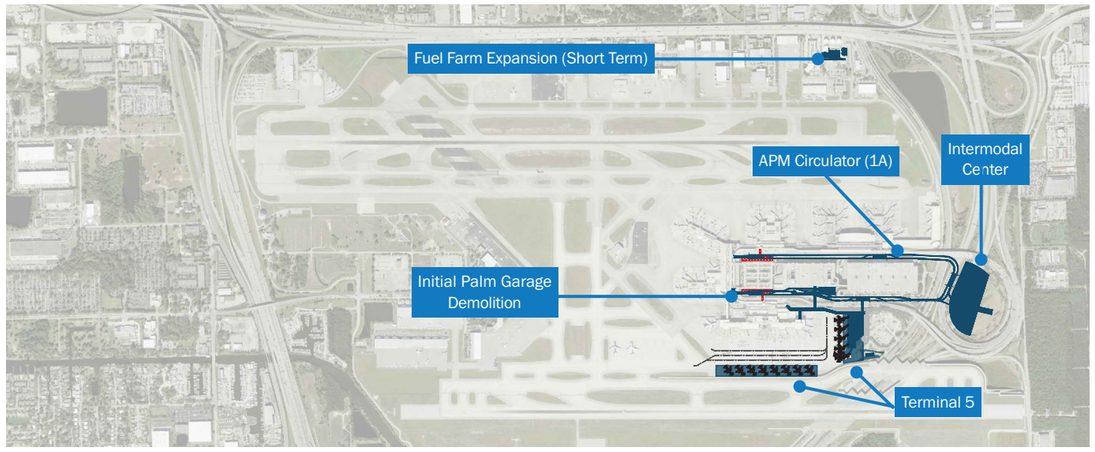

SOURCES: Illustrate My Design, LLC, March 2019; Ricondo & Associates, Inc., March 2019.

# 8 Phase 1 Program Sequencing and Financial Analysis

## 8.1 PHASE 1 PROGRAM SEQUENCING

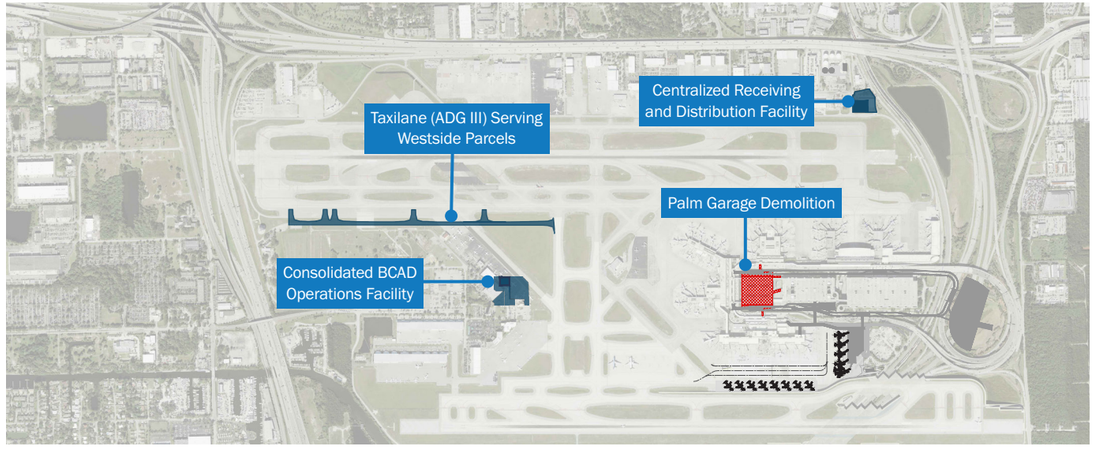
The Phase 1 projects were separated into six sequences, illustrated on the next several pages, reflect the anticipated order of implementation actions based on anticipated demand, project dependencies, affordability, and available funding. The timing of each project in the sequences should be periodically reevaluated and aligned to account for changes in the industry, the Airport, and the availability of funds. The completion of Phase 1 development is shown on page 33.

### Sequence 1

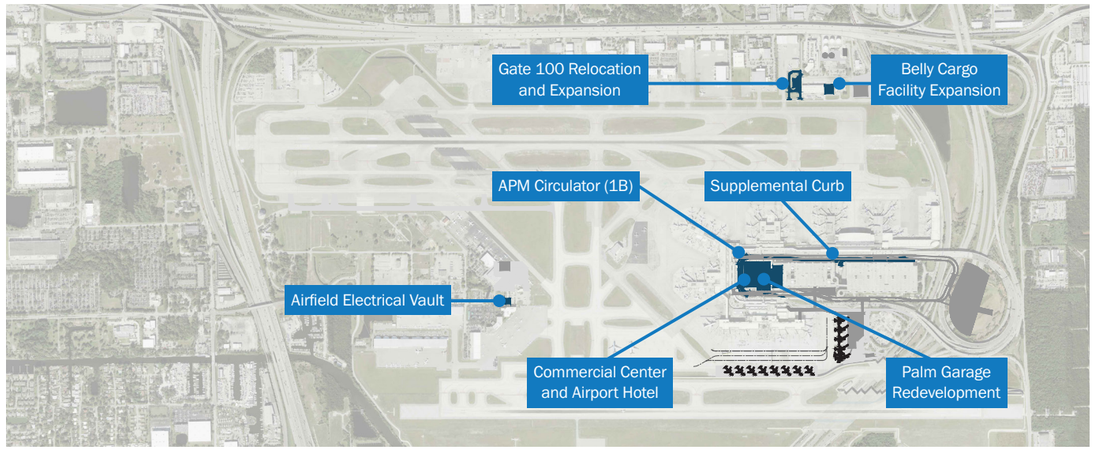



Projects not illustrated: Professional Services for Master Plan

### Sequence 2

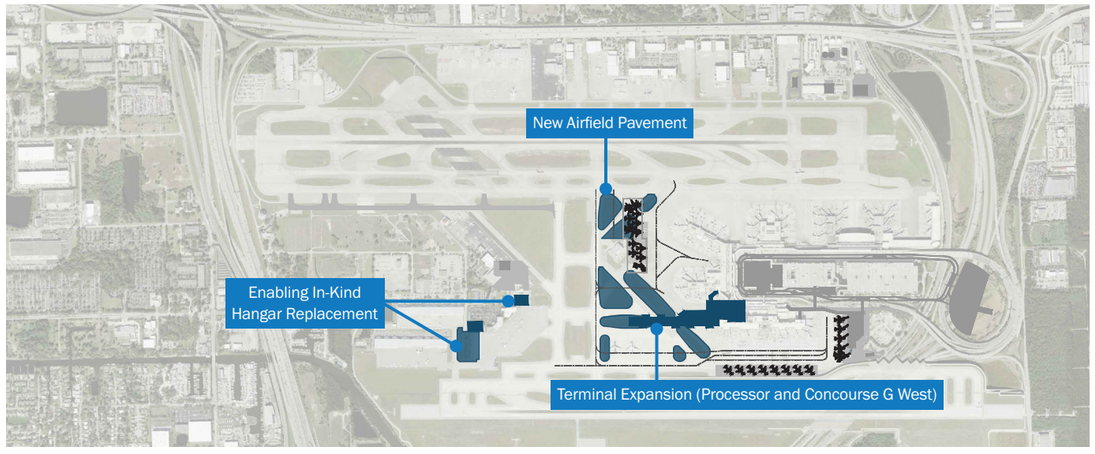



### Sequence 3




Projects not illustrated: Central Utility Plant, Terminal 4 Expansion Enabling Project & Code Compliance Improvements

### Sequence 4

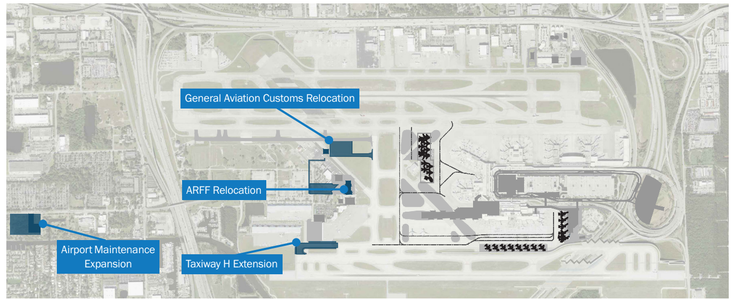



**Legend**

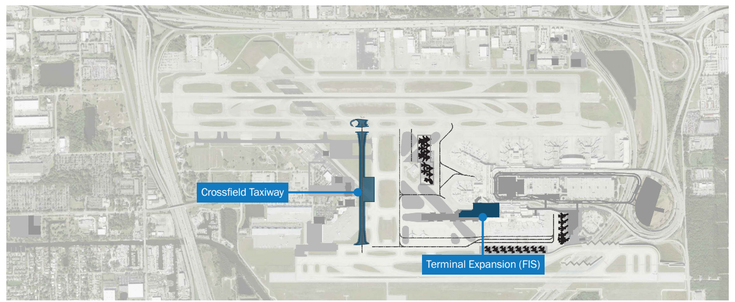
- Demolition
- New Construction
- New Facilities in Operation (Construction Completed)

**SOURCE:** Ricondo & Associates, Inc., April 2019.

### Sequence 5




### Sequence 6




**Legend**

- Demolition
- New Construction
- New Facilities in Operation (Construction Completed)

**SOURCE:** Ricondo & Associates, Inc., April 2019.

### Completion of Phase 1 Master Plan Development (all six sequences complete)

**SOURCES:** Illustrate My Design, LLC, March 2019; Ricondo & Associates, Inc., March 2019.

## 8.2 PHASE 1 FINANCIAL ANALYSIS

The following financial analysis provides a preliminary funding plan associated with the Phase 1 Master Plan Development. BCAD will continue to seek opportunities to maximize federal, state, and other funding sources in an effort to minimize future debt financing of capital projects.

The proposed funding strategy for the recommended airport development plan includes a variety of funding sources, as detailed below. The proposed funding plan does not include the use any local tax dollars. Actual financing strategies used will be determined as implementation approaches.

**Federal Grants (FAA)**
The FAA distributes grants under the Airport Improvement Program (AIP) to airport operators in two ways: entitlement grants and discretionary grants. Entitlement grants are distributed based on the number of enplaned passengers served at airports on an annual basis. Discretionary grants are distributed for individual projects based on funding availability and the priority of projects at airports nationwide. Cargo grants are distributed based on an Airport's total cargo tonnage for the previous fiscal year. AIP grants may be used to fund eligible land acquisition, noise mitigation, airfield improvements, airport roadways, and safety and security systems and equipment. Generally, only those projects that do not generate revenues are eligible for AIP grant funding.

**State Grants (FDOT)**
FDOT grants are funded from the State Transportation Trust Fund, which consists, in part, of funds collected through the state's aviation fuel tax. FDOT Grants supplement the AIP, providing a portion of the sponsor's matching share when federal funding is available and up to 80 percent of the overall project cost when it is not. The State of Florida frequently distributes funding awarded via FDOT Grants in a multiyear period for grant-approved projects. However, the availability of such funds in any given year is not guaranteed.

**Passenger Facility Charge**
The FAA allows the collection of Passenger Facility Chart (PFC) fees up to $4.50 for every enplaned passenger at commercial airports controlled by public agencies. Airports use these fees to fund FAA-approved projects that preserve or enhance safety, security, or capacity; reduce noise; or increase air carrier competition. In addition, PFCs may be used to pay debt service on debt used to fund PFC-eligible projects.

**Revenue Bond Proceeds**
General Airport Revenue Bonds (GARBs) is a type of municipal bond issued by the Airport which uses the revenues of an airport facility to back the bond. Proceeds from the issuance of GARBs are assumed to fund certain projects included in the ACIP and Phase I CIP.

**Airport Funds**
Revenues remaining after the payment of operating and maintenance expenses, outstanding debt service, and transfers to other accounts, as applicable, are deposited into BCAD's Improvements Account. Revenues in this fund may be used to fund capital improvement projects at the Airport.

**Tenant or Third-Party Funds**
Certain projects may be considered for private funding sources. General examples of projects that are often candidates for third-party funding include hangars, aircraft and automobile parking facilities, terminal facilities, and other facilities to be constructed by tenants under a lease agreement. Facilities that are constructed with private financial contributions may also provide a financial benefit in the form of land lease revenues to the Airport.

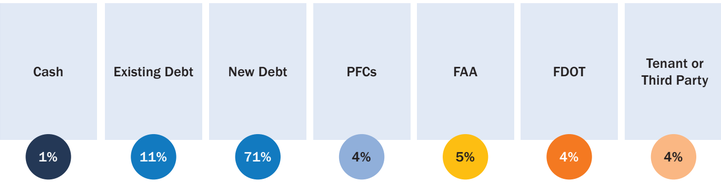


### 2019-2023 Airport Capital Improvement Program Plus Recommended Phase 1 Master Plan Development Plan

| Current Airport Capital Program 2019 - 2023[1] | + | Phase 1 Master Plan Development Plan | = | Total Airport Capital Improvement Plan |
|---|---|---|---|---|
| $1.5B | | $3.6B | | $5.1B |

[1] Based on the FY2019-FY2024 ACIP

**Recommended Phase 1 Master Plan Development – Preliminary Funding Breakdown**




SOURCES: Broward County Aviation Department, March 2019; Ricondo & Associates, Inc., March 2019.

The total estimated development cost for the Airport Capital Improvement Program (ACIP), based on FY2019 through FY2024 ACIP, combining the existing ACIP and Phase 1 Master Plan Development projects is approximately $5.1 billion in escalated dollars. Costs were developed in 2018 U.S. dollars, and have been escalated by 3.5 percent annually to project completion year to account for inflation. Estimated funding mechanisms include $67 million in airport funds, $600 million in existing bonds, $3.6 billion in new bonds, $200 million in PFC's, $250 million in FAA AIP grants, $200 million in FDOT grants, and $200 million in Tenant or 3rd party funds.

As implementation of the ACIP and Phase I Master Plan projects progress, BCAD staff should continually assess the financial feasibility of each project. Future considerations regarding funding of the ACIP and Phase I CIP projects include the following:

- Changes in enplaned passenger or traffic growth
- The emergence of other immediate or unanticipated needs that may materialize following the completion of the MPU
- Availability of AIP and FDOT funds
- Potential increase in maximum PFC level
- Ability to issue long-term debt in the form of revenue bonds
- Availability of third-party funds
- Monitoring project cost changes

# 9 Environmental Overview

The Environmental Overview (EO) summarizes environmental processing considerations for the recommended development projects proposed as part of this MPU, specifically as they relate to the requirements in FAA Order 1050.1F, Environmental Impacts: Policies and Procedures, and FAA Order 5050.4B, National Environmental Policy Act (NEPA) Implementing Instructions for Airport Actions. All projects that require a federal action including receipt of federal funding must comply with NEPA. State-level environmental review of MPU projects occurs through coordination with state agencies during the NEPA process as well as through environmental permitting processes.

The intent of an airport master plan environmental overview is to provide an understanding of key environmental issues that would likely need to be addressed as part of future environmental reviews of the MPU projects. The existing environmental conditions were identified and documented in the inventory and then considered in the analysis of alternatives. Based on the development associated with the recommended projects proposed as part of the MPU the following environmental resource categories have been preliminarily identified for any potential environmental impacts. More detailed environmental analysis will be required when projects near the development stage.

As the anticipated timing for undertaking MPU projects (other than those that have already been categorically excluded from further NEPA review) is further refined through advanced planning and design, these details should be reflected in the NEPA processing strategy. Ongoing collaboration with the FAA regarding updates and refinements to future project assumptions, such as timing and anticipated impacts, will be critical to refining a NEPA processing strategy and associated timeline for MPU projects.

**Preliminary NEPA Compliance Review for Phase 1 Master Plan Development**

| Project Name | Categorical Exclusion (CATEX)[1,3] | Potential for Project Footprint to affect Resource |
|---|---|---|
| **General and Administrative** | | |
| – Commercial Center (Phase 1 + Hotel) | No | |
| – Intermodal Center (APM Station, Transit Center, 4,500-Space Garage) Phase 1 | No | |
| – Supplemental Curb (Includes Demo of Palm Garage) | No | |
| – ARFF / Consolidated BCAD Operations Facility | Yes (para. 5-6.4.f)[2] | |
| – Belly Cargo Facility Expansion | Yes (para. 5-6.4.f)[2] | |
| – Airport Maintenance Expansion | Yes (para. 5-6.4.f)[2] | |
| – Bus Lot Staging and Maintenance | No | |
| – General Aviation Customs Relocation (Includes Airside Ramp) | No | |
| – Central Utility Plant (Central Chiller Plant) | No | |
| – Centralized Receiving and Distribution Facility | Yes (para. 5-6.4.f)[2] | |
| **Airfield** | | |
| – Airfield Electrical Vault | Yes (para. 5-6.3.b)[2] | |
| – Taxilane (ADG III) Serving Westside Parcels | Yes (para. 5-6.4.e)[2] | |
| – Taxiway H Extension | Yes (para. 5-6.4.e)[2] | |
| – Enabling In-Kind Hangar Replacement (Taxiway H) | Yes (para. 5-6.4.f)[2] | |
| – Crossfield Taxiway | Yes (para. 5-6.4.e)[2] | |

**Preliminary NEPA Compliance Review for Phase 1 Master Plan Development (continued)**

| Project Name | Categorical Exclusion (CATEX)[1,3] | Potential for Project Footprint to affect Resource |
|---|---|---|
| **Terminal** | | |
| – Terminal 5 (Formally 5-Gate Terminal) | Yes (para. 5-6.4.h)[2] | |
| – APM Circulator | No | |
| – Terminal 4 Expansion Dependencies and Code Compliance Improvements | Yes (para. 5-6.4.e)[2] | |
| – Hardstand Parking | Yes (para. 5-6.4.h)[2] | |
| – Utility Improvements (Consolidated Utility Duct Bank) Phase 1 – Terminal 4 | Yes (para. 5-6.4.j)[2] | |
| – Airfield Improvements Associated with Terminal Development Phase 1 | See Note 4 | |
| – Terminal Expansion Phase 1 (Concourse G west expansion, FIS, and Processing) | See Note 4 | |
| **Security** | | |
| – Gate 100 Relocation and Expansion | No | |
| – South AOA Gate (Gate 504) | Yes (5-6.4.f)[2] | |
| **Machinery, Equipment, Vehicles, and Other** | | |
| – Fuel Farm Expansion (Short-Term) and Oil/Water Separator | Yes (5-6.4.u)[2] | |
| **Parking** | | |
| – Palm Garage Redevelopment | Yes (5-6.4.h)[2] | |

**Legend**

- Biological Resources
- Department of Transportation Act, Section 4(f) Resources
- Hazardous Materials
- Cultural Resources
- Floodplains
- Surface Waters and Wetlands
- Air Quality
- Aircraft Noise

**NOTES:**
1 No = Not typically eligible for categorical exclusion or insufficient information to confirm potentially applicable CATEX citation.
2 Refer to page 38 for a summary of the applicable FAA categorical exclusions found within U.S. Department of Transportation, Federal Aviation Administration, Order 1050.1F, Environmental Impacts: Policies and Procedures, July 16, 2015.
3 Coordination with the FAA on the level of NEPA review (i.e., CATEX, EA, or EIS) would need to occur for each project or set of connected projects. The FAA would make the final decision on the level of NEPA review.
4 These MPU projects are within the footprint of the approved terminal redevelopment boundary approved by the Federal Aviation Administration's Record of Decision for The Development and Expansion of Runway 9R-27L and Other Associated Airport Projects at Fort Lauderdale–Hollywood International Airport, Broward County, Florida, December 2008. Therefore, current environmental approvals may be applicable; although, the facility redevelopment configurations differ.

**SOURCES:** Kimley-Horn and Associates, Inc., November 2018; Ricondo & Associates, Inc., November 2018.

## FAA Order 1050.1F
## Policies and Procedures for Considering Environmental Impacts

CATEX citations is subject to FAA review for the potential for extraordinary circumstances (i.e., factors or circumstances in which a normally categorically excluded action may have a significant environmental impact that requires further analysis in an Environmental Assessment (EA) or an Environmental Impact Statement (EIS)) before finalizing a decision to categorically exclude a proposed action.

**FAA Order 1050.1F, Paragraph 5-6.3.b**
Establishment, installation, upgrade, or relocation of any of the following on designated airport or FAA property: airfield or approach lighting systems, visual approach aids, beacons, and electrical distribution systems as described in FAA Order 6850.2, Visual Guidance Lighting Systems, and other related facilities.

**FAA Order 1050.1F, Paragraph 5-6.4.e**
Federal financial assistance, licensing, or ALP approval for the following actions, provided the action would not result in significant erosion or sedimentation, and will not result in a significant noise increase over noise sensitive areas or result in significant impacts on air quality. (1) Construction, repair, reconstruction, resurfacing, extending, strengthening, or widening of a taxiway, apron, loading ramp, or runway safety area (RSA), including an RSA using Engineered Material Arresting System (EMAS); or (2) Reconstruction, resurfacing, extending, strengthening, or widening of an existing runway. This CATEX includes marking, grooving, fillets, and jet blast facilities associated with any of the above facilities.

**FAA Order 1050.1F, Paragraph 5-6.4.f**
Federal financial assistance, licensing, ALP approval, or FAA construction or limited expansion of accessory on-site structures, including storage buildings, garages, hangars, t-hangars, small parking areas, signs, fences, and other essentially similar minor development items.

**FAA Order 1050.1F, Paragraph 5-6.4.h**
Federal financial assistance, licensing, or ALP approval for construction or expansion of facilities–such as terminal passenger handling and parking facilities or cargo buildings, or facilities for non-aeronautical uses at existing airports and commercial space launch sites–that do not substantially expand those facilities (see the FAA's presumed to conform list; 72 Federal Register 41565 [July 30, 2007]).

**FAA Order 1050.1F, Paragraph 5-6.4.j**
Removal or extension of water, sewage, electrical, gas, or other utilities of temporary duration to serve construction.

**FAA Order 1050.1F, Paragraph 5-6.4.u**
Approval of an ALP for installation of on-airport, aboveground storage tanks or underground storage tanks (USTs) on airport property or FAA installation, repair, or replacement of USTs and aboveground storage tanks at FAA facilities. These actions must comply with FAA Order 1050.15, Fuel Storage Tanks at FAA Facilities, and EPA regulations, 40 CFR Parts 112, 280, and 281, as applicable. This CATEX includes the closure and removal of a fuel storage tank, and remediation of contaminants resulting from a fuel storage tank at an FAA facility or on an airport, provided those actions occur in accordance with the order and the regulations noted above. The establishment of bulk fuel storage and associated distribution systems is not within the scope of this CATEX. Those actions are subject to Paragraph 3-1.2.b.(5) of this Order.

**SOURCE:** Illustrate My Design, LLC, March 2019.

# 10 Sustainability Initiatives

Climate change has been a key focal area for Broward County since 2008. Broward County's Comprehensive Plan's Climate Change Element's goal of achieving a sustainable, climate resilient community is consistent with the FAA's Airport Sustainable Master Plan Pilot Program and FDOT's Airport Sustainability Guidebook. These guiding documents, along with BCAD's Sustainability Vision, are the foundation for the MPU's Sustainability Initiatives chapter.

As described in the proposed Airport Development Plan, the MPU's new/expanded facilities, as well as the activities supported by those facilities, will result in an increase in energy use. This correlates to an increase in greenhouse gas (GHG) emissions, water consumption, and waste generation. Additionally, because of sea-level rise and future flooding projections, the new/expanded facilities may require stormwater retention capacity that exceeds the current standards. Therefore, the new/expanded facilities should be resilient to the effects of climate change.

In order to effectively address the current and future impacts of the growth of FLL, the development of sustainability initiatives were generally structured to adhere to the following:

- Initiatives should be straightforward and clear to support implementation.
- Initiatives should be achievable through the future implementation of MPU projects.
- Initiatives should be consistent with and in furtherance of Broward County's 2015 Climate Change Action Plan's six plan elements (e.g., policy, natural systems, water supply, energy resources, built environment, and community outreach).
- Initiatives should be consistent with and in furtherance of the adopted 2019 Broward County Comprehensive Plan's Climate Change Element.
- Initiatives should be consistent with and in furtherance of BCAD's Sustainability Vision and Guiding Principles established in 2012.

Therefore, in consideration of the anticipated new/expanded facilities and associated activities, 25 initiatives were identified to address the following sustainable development areas:

- **Waste management –** minimize the generation of waste through reduction, reuse, and recycling. Examples of these initiatives include developing new facilities that provide sufficient space for waste collection, sortation and materials recovery and establish a recycling goal for construction projects.
- **Energy and GHG reductions –** increase sustainable energy use through efficiency and conservation efforts and expand access to renewable and alternative energy sources. Examples of these initiatives include integration of renewable resources into new development, explore opportunities to convert fleet vehicles to alternative fuel and/or zero emission vehicles, and prioritization of multi-modal connectivity,
- **Water supply –** reduce the use of potable water. Examples of these initiatives include the development of a stormwater master plan that incorporates proposed MPU development projects, heightened finished floor elevations with new facilities to promote long-term resiliency, and use of low-flow fixtures within facilities.
- **Resilient design –** use design strategies that support recovery from disasters and other disruptions. Examples of these initiatives include committing to LEED certification for new BCAD facilities and integrate daylight harvesting with sensor technology.
- **Community communications, outreach, and partnering –** use communications strategies, community events, and partnerships to build connections between the Airport and the community to increase awareness and mobilize action on climate change. Examples of these initiatives include promotion of alternative mode access to the airport and enhancement of FLL's communication as it relates to sustainability.

BCAD will manage sustainability initiative implementation by integrating consideration of sustainability into the project development process (e.g., advanced planning, design, construction, and operation). A full listing and description of each sustainability initiative is provided in the MPU Sustainability Initiatives Chapter.



# 11 Stakeholder Engagement and Public Outreach

The MPU included a robust outreach program intended to ensure the effort benefited from the input of stakeholders, the public, federal, state, and local agencies. Comments and input were solicited through public workshops, committee briefings, one-on-one meetings, and through the BCAD website. Public outreach and stakeholder engagement briefings during the MPU took place during the following dates:

## Summary of Key Stakeholder Meetings

| | |
|---|---|
| **Regular** | • **Weekly:** Project Coordination with BCAD Development and Planning Staff<br>• **Bi-Weekly:** Executive Director Briefings |
| **2016**<br>• Visioning<br>• AGIS<br>• Market Assessment<br>• Inventory<br>• Preliminary Forecasts<br>• Preliminary Demand Capacity/ Facility Requirements | • **January, February, August, September:** Airline Briefings<br>• **May:** Broward County Staff, FAA Airports District Office (ADO) Briefing<br>• **September:** Policy Advisory Committee (PAC) & Technical Advisory Committee (TAC) – Briefing #1,<br>• **August, September, November:** Metropolitan Planning Organization (MPO)<br>• **October:** Airport Airline Affairs Committee Briefing #1 |
| **2017**<br>• Forecasts Approved<br>• Refined Demand Capacity/ Facility Requirements<br>• Preliminary Alternatives | • **June, November:** Florida Department of Transportation (FDOT) & Metropolitan Planning Organization (MPO) Briefings and Coordination Meetings<br>• **July:** PAC & TAC – Briefing #2<br>• **October:** Federal Aviation Administration (FAA) Airports District Office (ADO) Briefing |
| **2018**<br>• Refined Alternatives<br>• Preliminary CIP and Financial Analysis<br>• Environmental Overview<br>• Sustainability Initiatives<br>• Preliminary ALP Development | • **January:** FAA & FDOT Briefing, Airport Airline Affairs Committee Briefing #2<br>• **February:** FLL Public Open House Workshop #1<br>• **May:** Airport Airline Affairs Committee Briefing #3, BOCC Briefing<br>• **June:** PAC & TAC – Briefing #3 |
| **2019**<br>• Refined CIP and Financial Analysis<br>• Implementation and Sequencing<br>• Initial ALP Submission | • **March:** BCAD Development Workshop, BCAD Divisions Workshop, BCAD Executive Workshop<br>• **April:** Airport Airline Affairs Committee Briefing #4, Florida Department of Transportation & Metropolitan Planning Organization Briefing, County Administrator Briefing<br>• **June:** BOCC Briefing<br>• **July:** FLL Public Open House Workshop #2, PAC & TAC – Briefing #4 |

# 12 Acknowledgments


**Broward County Aviation Department**

**Mark Gale**
Chief Executive Officer/Director of Aviation

**Michael Nonnemacher**
Aviation Chief Operating Officer/Deputy Director

**Marc Gambrill**
Aviation Chief Development Officer

**Celina Saucedo**
Aviation Chief Administrative Officer

**Doug Wolfe**
Aviation Chief Financial Officer

**Frank Capello**
Enterprise Director of Security

**Yasmi Govin**
Enterprise Director of Business

**Mike Pacitto**
Enterprise Director of Planning

**John Pokryfke**
Enterprise Director of Operations

**Angela Scott**
Information Systems Administrator

**Richard Waskiewicz**
Enterprise Director of Facilities Maintenance

**Jason Watkins**
Enterprise Director of Finance

**William Castillo**
Airport Planning Manager

**Karen Friedman**
Senior Planner

**Ken Coutain Jr.,**
Planner

**Policy Advisory Committee and Technical Advisory Committee**

Special thanks to all members representing the various stakeholder organizations that made up the Policy and Technical Advisory Committees. Your contribution to this master plan is greatly appreciated.

**Consultant Team**

Ricondo & Associates, Inc.

ACAI Associates, Inc.

Arora Engineers, Inc.

Basulto Management Consultants, Inc.

Craven Thompson & Associates, Inc.

Dickey Consulting Services, Inc.

Florida Transatlantic Holdings, LLC.

Garth Solutions, Inc.

Illustrate My Design, LLC.

Kimley-Horn & Associates, Inc.

Lea & Elliot, Inc.

Quantum Spatial, Inc.

R.J. Behar & Company, Inc.



BROWARD
COUNTY
FLORIDA


FORT LAUDERDALE-HOLLYWOOD
INTERNATIONAL AIRPORT
BROWARD COUNTY, FLORIDA