

8. Capital Improvement Program and Financial Analysis

8.1 Introduction

The Capital Improvement Program (CIP) and Financial Analysis presented herein describes the timing of proposed Master Plan Phase 1 improvements, estimated rough-order of magnitude (ROM) development costs, and potential funding sources. This CIP and associated financial analyses are intended to provide general sequencing and implementation guidance for Broward County (County) and Broward County Aviation Department (BCAD) staff to support decision-making relative to recommended development at the Airport. The information provided in this document can also be used to update and inform the annual Airport Capital Improvement Program (ACIP) shared with the Federal Aviation Administration (FAA) and Florida Department of Transportation (FDOT), the Joint Automated Capital Improvement Program (JACIP), BCAD's annual capital budgeting process, and to facilitate discussions with airport stakeholders.

The CIP and Financial Analysis prepared as part of the Master Plan Update are based upon information, data, and financial conditions that existed during the period from June 2018 through March 2019. For example, the CIP included in the Master Plan Update comprises BCAD's FY2019-FY2023 Capital Improvement Program, which was the current CIP available at that time, along with the various projects identified for the Phase 1 Program associated with the Master Plan Update. The Master Plan Update CIP and Financial Analysis included in this Chapter reflect the information presented to the airlines in April 2019 and the Board of County Commissioners in June 2019. However, in September 2019 thru November 2019, Broward County issued the Series 2019 Airport System Revenue Bonds which reflected additional financial analysis based upon more recent information compared to that utilized for the Master Plan Update. Therefore, in recognition that the financial analysis associated with the Series 2019 Airport System Revenue Bonds is reflective of FLL's most current financial position, the results of the Series 2019 Airport System Revenue Bonds are presented alongside the Master Plan Update results as appropriate within the tables and exhibits contained throughout this Chapter.

The CIP includes projects that increase or improve the capacity, operational efficiency, and/or processing capabilities of FLL's airfield, terminals, landside facilities, general aviation facilities, cargo facilities, and other airport or airline support areas which are necessary to accommodate future demand levels. These projects have been identified and analyzed at a conceptual level through the master planning process. To develop a comprehensive CIP, the ongoing maintenance, existing facility rehabilitation needs, and existing BCAD development projects must also be considered. These projects are identified on BCAD's existing ACIP and are incorporated into the sequencing of the CIP.

In addition to the timing of projects, the financial analysis is performed for purposes of determining overall affordability of the recommended program. The results have been evaluated and discussed with stakeholders including the Airlines, FAA, and FDOT throughout the planning process. Funding constraints and several other financial metrics including cost per enplaned passenger, debt service coverage, and impacts to airline rates and charges are discussed in Section 8.4.

Based upon coordination with BCAD staff resulting from analysis and subsequent discussion of the affordability of the overall CIP, some projects are anticipated to be deferred beyond the 20-year planning horizon. Therefore, the focus of the CIP, implementation schedule, and financial analysis includes those projects contained within Phase 1 of the overall Master Plan Update's (MPU's) development plan. The following criteria was used to define the Phase 1 program:

- Accommodate future activity growth as forecasted in the MPU
- Leverage development approved in South Runway Environmental Impact Statement (EIS) / Record of Decision (ROD)
- Prioritize projects that promote capacity balance between airside, terminal, and landside systems
- Provide opportunities for growth in, and diversification of nonaeronautical revenues

8.2 Capital Improvement Program

The proposed MPU recommendations have been divided into three phases for implementation purposes: Phase 1, Phase 2, and Phase 3. **Table 8.2-1** depicts a comparison of planning activity levels which were used as a basis in defining the timing of projects within each phase. Phase 1 addresses airport needs that require immediate attention for growing passenger volumes reaching PAL 1. These projects include but are not limited to a Terminal 4 westward expansion to increase the Airport's gate inventory up to 77 gates, terminal roadway projects to relieve vehicular congestion, an initial pinched-loop APM to facilitate passenger movement, an Intermodal Center which provides vehicle parking and commercial opportunities, and the redevelopment of Palm Garage to provide more vehicle parking, a ground transportation center, and commercial concessions opportunities. Phase 2 projects address forecasted PAL 2 passenger volumes. This phase includes but is not limited to the redevelopment of Terminal 3 to the west and the construction of a new northern concourse pier to increase the Airport's gate inventory to 85 gates, the establishment of a new APM station at Terminal 3 to complete a full closed-loop bidirectional APM system, and the incremental expansion of the Intermodal Center. Phase 3 represents long-term projects beyond the PAL 3 demand levels. These projects include but are not limited to the construction of terminal building to provide additional gates resulting in an Airport gate inventory of 95 gates, the expansion of the terminal roadway system, curbs and landside facilities to the west, and the Commercial Center phase 2 expansion.

BCAD chose not to include a formal obstruction mitigation program within the CIP due to on-going internal discussions on whether this program should be capital or operationally funded. If it is ultimately decided that an obstruction mitigation program should be incorporated within the CIP, BCAD will coordinate with FAA and FDOT for program support. A program funding strategy will be defined at that time with appropriate grant requests following thereafter.

Table 8.2-1: Planning Activity Level Comparison

Passenger enplanements for FY2019 were 18,164,427
 Airport operations for FY2019 were 323,648

	BASELINE (2015)	ACCELERATED BASELINE FORECAST		
		PAL 1 (2020)	PAL 2 (2025)	PAL 3 (2035)
Annual Enplanements	13.2 million	18.4 million	21.0 million	26.2 million
Annual Aircraft Operations (Airline)	215,192	287,400	318,100	369,500
Design Day Aircraft Operations (Airline)	708	928	1,022	1,182
Gate Requirements ^{1/}	58	66	71	83

NOTES:

PAL = Planning Activity Level

1/ These requirements are demand driven; they exclude spare gates, BCAD-controlled gates, and new entrant gates.

SOURCES: Broward County Aviation Department, 2016 (Actuals for FY 2015); Ricondo & Associates, Inc., 2016.

PREPARED BY: Ricondo & Associates, Inc., February 2017.

8.2.1 CAPITAL IMPROVEMENT PROGRAM

The CIP projects include those projects in the Airport's current ACIP and projects identified in the MPU to meet demand associated with PAL 1 and PAL 2. It is important to note that the 77 gate buildout was used as guiding criteria for the initial phase of terminal development based on prior environmental approvals associated with the South Runway Environmental Impact Study (EIS) that allows FLL to build up to 77 gates without additional environmental documentation. These projects have been included in the financial analysis section and are discussed throughout the remainder of the document. The CIP projects are presented on **Exhibit 8.2-1** and will tentatively be implemented between fiscal year (FY) 2020 and FY 2034 (Planning Period). In general, The Phase 1 MPU recommendations comprise the CIP discussed in this section. The timing of the improvements has been aligned with demand, funding opportunities, and affordability. The CIP sequencing discussed below is intended to provide maximum flexibility and functionality for future implementation discussion and decision making. The remainder of this section, including the project descriptions, proposed implementation sequencing, and rough order of magnitude (ROM) cost estimates is limited to the MPU Phase 1 projects.

Appendix K contains the Capital Project Request Forms that BCAD uses to initiate projects and circulate for internal planning purposes. The forms contain the following critical elements necessary to complete the projects.

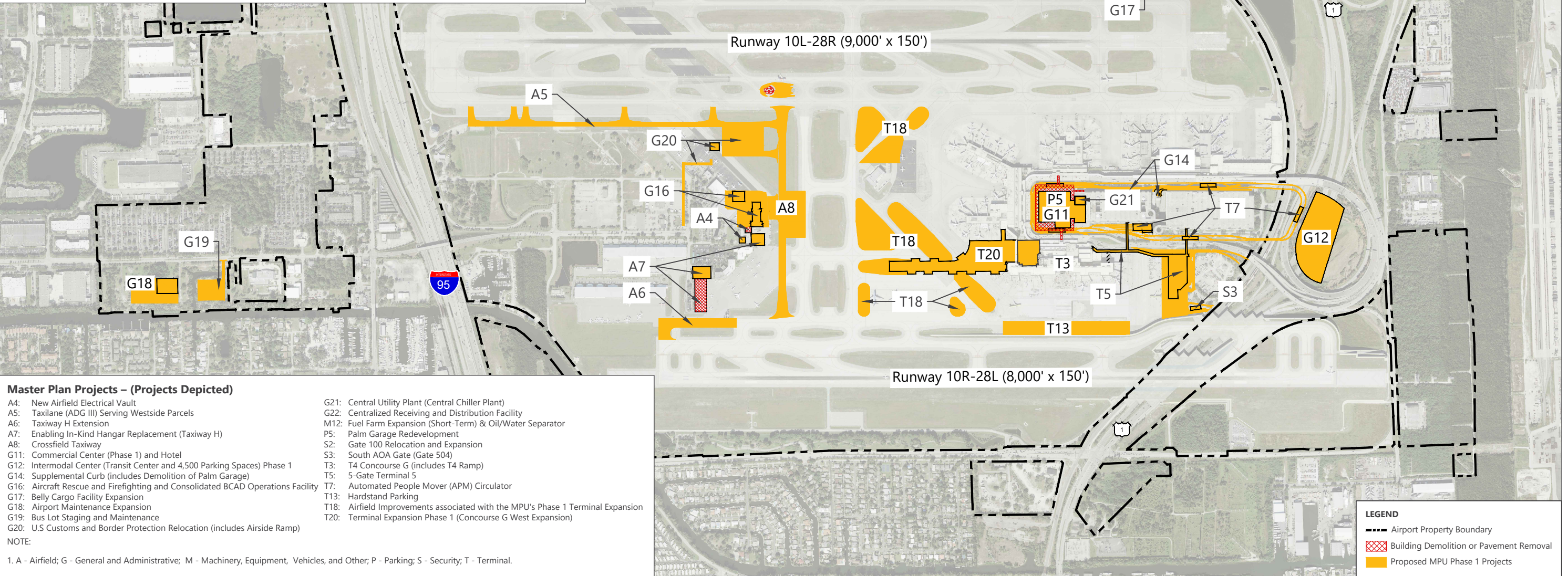
- project description and justification
- project alternatives
- project schedule and cost estimate by planning and design, construction, security component, and other costs
- total project cost by funding source and schedule
- primary objective of project



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Active and Ongoing Airport Capital Improvement Projects – (Projects not Depicted)

- | | |
|---|---|
| A1: RTR Relocation | M10: Radio Replacement |
| G1: Airport Access Roadway System | M11: Emergency Mass Notification System |
| G2: Professional Services for Master Plan | P1: Rehabilitation of RCC, Hibiscus, and Palm Garages |
| G3: Facility Improvement Allowance | P2: Parking Revenue Control System Upgrade |
| G4: Noise Mitigation (RSI) Non AIP Eligible Costs | P3: Remote Parking Lot Expansion |
| G5: Naval Air Station Museum | S1: Life Cycle Replacement of Cameras, NVRs, and Storage Devices |
| G7: Stormwater Upgrades | S2: Passenger Screening Lanes |
| G8: On-Call Planning Services | T1: T4 Federal Inspection Services (FIS) |
| G9: Update IT Communications Master Plan | T2: T4 Checked Baggage Inspection System (CBIS) |
| M1: Passenger Boarding Bridges (39) Replacement | T4: Terminal Connectors (T 1, 2, 3, 4) |
| M2: IS Hardware Renewal and Replacement | T9: Baggage Handling System Software Upgrades |
| M3: Equipment Replacement | T10: Terminal Modernization Project and T1 CBRA Room Improvements |
| M4: Longterm Infrastructure Equipment Replacement | T11: T1 Concourse B and C Exterior Windows Replacement |
| M5: Equipment - New | T12: Terminal 4 Expansion Dependencies and Code Compliance Improvements |
| M6: Vehicle Replacement | T14: Utility Improvements (Consolidated Utility Duct Bank) Phase 1 - Terminal 4 |
| M7: Vehicles - New | T20: Terminal Expansion Phase 1 (Processing and T4 FIS) |
| M8: Mobile Application Development | T24-T27: Terminals 1 - 4 Roofing Improvements (Allowance) |
| M9: IT Comm Room Improvements | |



Master Plan Projects – (Projects Depicted)

- | | |
|---|---|
| A4: New Airfield Electrical Vault | G21: Central Utility Plant (Central Chiller Plant) |
| A5: Taxiway (ADG III) Serving Westside Parcels | G22: Centralized Receiving and Distribution Facility |
| A6: Taxiway H Extension | M12: Fuel Farm Expansion (Short-Term) & Oil/Water Separator |
| A7: Enabling In-Kind Hangar Replacement (Taxiway H) | P5: Palm Garage Redevelopment |
| A8: Crossfield Taxiway | S2: Gate 100 Relocation and Expansion |
| G11: Commercial Center (Phase 1) and Hotel | S3: South AOA Gate (Gate 504) |
| G12: Intermodal Center (Transit Center and 4,500 Parking Spaces) Phase 1 | T3: T4 Concourse G (includes T4 Ramp) |
| G14: Supplemental Curb (includes Demolition of Palm Garage) | T5: 5-Gate Terminal 5 |
| G16: Aircraft Rescue and Firefighting and Consolidated BCAD Operations Facility | T7: Automated People Mover (APM) Circulator |
| G17: Belly Cargo Facility Expansion | T13: Hardstand Parking |
| G18: Airport Maintenance Expansion | T18: Airfield Improvements associated with the MPU's Phase 1 Terminal Expansion |
| G19: Bus Lot Staging and Maintenance | T20: Terminal Expansion Phase 1 (Concourse G West Expansion) |
| G20: U.S Customs and Border Protection Relocation (includes Airside Ramp) | |

NOTE:
1. A - Airfield; G - General and Administrative; M - Machinery, Equipment, Vehicles, and Other; P - Parking; S - Security; T - Terminal.

SOURCE: Broward County Aviation Department, September 2019 (Aerial Photography); Ricondo & Associates, Inc., March 2019.
PREPARED BY: Ricondo & Associates, Inc., March 2019.



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Phase 1 Project Descriptions

The MPU Phase 1 projects include improvements to the airside, terminal, landside, and support facilities. The projects are necessary to maintain and/or improve FLL's existing airside and landside facilities, increase the capacity of aircraft gates and passenger processing facilities, develop support facilities to accommodate forecast demand, and enhance customer experience. The Phase 1 projects are categorized into the following types of projects described below.



Maintain Existing Facilities – Investment into existing facilities to prolong their useful life or expand the capability to enhance capacity.



Aircraft Gates – Provide additional gates to service future airline activity while also increasing the number of domestic/international capable gates.



Additional Passenger and Baggage Processing – Expand areas dedicated to passenger and baggage processing to optimize capacity and passenger throughput.



Federal Processing – Expand the Transportation Security Administration (TSA) and U.S. Customs and Border Protection (CBP) (International Arrivals) capacities to meet anticipated demand levels.



Landside Capacity – Provide additional means of managing vehicular traffic to relieve the failing roadway system.



Customer Experience – Maintain the “easy-in, easy-out” reputation of FLL. Modernize facilities to enhance the services and offerings provided to customers.



Airside Improvements – Airfield enhancements to improve aircraft circulation and apron modifications to facilitate terminal expansion.



Support Facilities (New or Expanded) – Airline and airport functions not associated with terminal and landside improvements.

Throughout this section, the MPU Phase 1 projects are identified using an alpha numeric naming convention based on their primary functional area. Project priority in some instances will correspond with project sequencing due to a variety of factors including affordability and the need to advance or delay projects for other project dependencies. Projects are identified using the following naming convention:

- G – General and Administrative
- A – Airfield
- T – Terminal
- S – Security
- M – Machinery, Equipment, Vehicles, and Other
- P – Parking

The CIP projects identified and recommended in the MPU as Phase 1 are categorized by type, sorted by alpha numeric identifier, and are described below.

General and Administrative



G2: Professional Services for Master Plan - This project covers future planning activities for the MPU Phase 1 projects presented in the CIP, including but not limited to program/project definition documents (PDD), basis of design (BOD) documents, environmental review for proposed facilities, landside traffic modeling, and passenger traffic modeling. This project is needed to accommodate increasing passenger demands on the airside, landside, parking, and terminal areas.



G11: Commercial Center (Phase 1) and Hotel – This project includes the programming, design, and construction of an approximately 160,000 square foot commercial center and 300-room (approximate) hotel. This project enhances the customer experience by providing entertainment areas, public space, concessions, meeting rooms, and the convenience of an on-airport hotel. Furthermore, the hotel and commercial center will provide the airport with non-aeronautical revenue.



G12: Intermodal Center (Transit Center and 4,500 Parking Spaces) Phase 1 – This project consists of the programming, design, and construction of an 8-level parking garage which will provide approximately 4,500 parking spaces. Level 1 will be constructed to include a bus transfer area and transit center. This project is needed to meet future vehicular parking demand. Additionally, the parking constructed as part of this project will temporarily offset the loss of vehicular parking spaces associated with the demolition of the Palm Garage, which is required to facilitate the construction of the Supplemental Curb (G14) and Automated People Mover (T7) projects.



G14: Supplemental Curb (Includes Demolition of Palm Garage) – This project includes the programming, design, and construction of a new supplemental roadway with added terminal curb fronts along each Terminal and the demolition of the existing Palm Garage. The supplemental curb is necessary to alleviate congestion on Terminal Drive, particularly along Terminals 3 and 4 and improve the roadway level of service.



G16: Aircraft Rescue and Firefighting (ARFF) Station and Consolidated BCAD Operations Facility – This project includes the redevelopment of a general aviation parcel to provide for a new ARFF facility and a new consolidated BCAD operations facility. These two buildings will be separate facilities but will have a shared parking area. The relocation of the ARFF facility is necessary to provide space for the expansion of Terminal 3 to the west. The existing public safety office (part of the Airport Operations Department) functions are forecast to be deficient by approximately 13,000 square feet by 2035.



G17: Belly Cargo Facility Expansion – This project includes the design and construction of a 32,000 square foot expansion of the Airport's existing belly cargo building. The existing belly cargo building is currently fully leased to two tenants and does not have any available space. Expanding the existing belly cargo building is the preferred alternative to increase belly cargo capacity for existing tenants and/or to assist in marketing new air carriers seeking belly cargo space.



G18: Airport Maintenance Expansion – This project includes the programming, design, and construction of two maintenance buildings. One building will accommodate a 45,000 square foot recycling center and another will house a 22,000 square foot maintenance shop, warehouse, and indoor storage facility. This project will also include the construction of an outdoor paved storage lot and a landscaping area totaling 4 acres. An expanded maintenance facility will provide the necessary space to accommodate future shop, storage, and maintenance parking demand.



G20: U.S. Customs and Border Protection Relocation (includes Airside Ramp) – This project includes the programming, design, and construction of a general aviation (GA) U.S. Customs and Border Protection (CBP) facility. The new facility will consist of a 10,000 square foot building and approximately 257,000 square feet of apron for aircraft circulation and inspection. The existing GA CBP facility does not have adequate vehicular parking and will be displaced by the future crossfield taxiway project (A8). A relocated and expanded GA CBP is needed to provide the necessary apron space to satisfy future demand.



G21: Central Utility Plant (Central Chiller Plant) – This project includes the siting, programming, design, and construction of a central chiller plant used to chill water for each terminal's air handling units. The air handling units will use this chilled water to condition the air in a reliable, efficient, and low maintenance manner. A central chiller plant will reduce complexity of providing conditioned air to multiple terminals and will reduce maintenance costs.



G22: Centralized Receiving and Distribution Facility – This project includes the programming, design, and construction of a 30,000 square foot building, vehicular parking, and truck docks. The existing building located on the proposed site of the centralized receiving and distribution facility will be demolished as part of the project. A centralized receiving and distribution facility will streamline the security screening for concessions and reduce congestion at the terminals' security screening lanes.

Airfield



A4: New Airfield Electrical Vault – This project includes the programming, design, and construction of a new airfield electrical vault, including new electrical equipment, and the extension of the existing underground ducts and utility lines to the new location. The airfield electrical vault is necessary to provide space for the construction of a new aircraft rescue and firefighting (ARFF) station (G16), which will be displaced to accommodate the Phase 2 Terminal Development Program.



A5: Taxilane (Airplane Design Group (ADG) III) Serving Westside Parcels – This project includes the programming, design, and construction of an approximate 4,000-foot by 50-foot wide taxilane, parallel to Taxiway C to accommodate ADG III aircraft, serving the westside parcels. This project is necessary to support aircraft movements to and from the westside development parcels. Furthermore, a new dedicated taxilane will minimize disruptions to the existing aircraft traffic flows and departure queuing on Taxiways B and C.



A6: Taxiway H Extension – This project includes the programming, design, and construction of an approximate 930-foot extension of Taxiway H and connection to Taxiway J. The extension to Taxiway H will require the demolition of an existing 56,000 square foot aircraft hangar located inside the future taxiway's object free area. This will provide dual full-length parallel taxiways for Runway 10R-28L, enhance aircraft maneuverability and will provide additional queue space for departing aircraft which frequently backs up to the midfield taxiways during peak departure periods.



A7: Enabling In-Kind Hangar Replacement (Taxiway H) – This project includes the programming, design, and construction of two new in-kind aircraft hangars displaced by the Taxiway H extension project (A6). The hangars are approximately 28,000 square feet each and are necessary to maintain the tenant's current aircraft storage capacity.



A8: Crossfield Taxiway – This project includes the programming, design, and construction of a new, approximately 2,800-linear foot ADG V crossfield taxiway, parallel to Taxiway L which ultimately replaces existing Taxiway Q. Taxiway Q, one of two existing crossfield taxiways will be decommissioned and converted to an ADG III taxilane in support of the MPU's Phase 2 Terminal Development Program. Maintaining dual parallel ADG V taxiways is necessary for aircraft flows and maneuverability between the north and south airfields.

Terminal



T5: 5-Gate Terminal 5 - This project includes the programming, design, and construction of a 5-gate terminal located east of Terminal 4. Additional aircraft gates are needed to accommodate the near-term aviation activity demand as outlined in the FAA accepted accelerated baseline forecast derived as part of the MPU. Passenger access to the 5GT will be provided by a new dedicated access road with corresponding curbs for departing and arriving passengers. Additional terminal connectivity will be provided through a multi-level pedestrian bridge connecting the 5GT to Terminal 4 and Concourse G.



T7: Automated People Mover (APM) Circulator – This project includes the programming, design, and construction of approximately 8,000 linear feet of elevated, dual-lane guideway that will traverse the landside areas of the terminal complex. Seven stations will provide access to each terminal as well as the Airport’s parking garages and proposed intermodal center. The APM is intended to enhance terminal area passenger connectivity and reduce landside congestion along Terminal Drive by providing an additional means of accessing the terminal core.



T12: Terminal 4 Expansion Dependencies and Code Compliance Improvements – This project includes the programming, design, and construction of the improvements necessary to bring Terminal 4 into compliance with current County codes. The Terminal 4 systems, located between the terminal curb and the security screening checkpoint, to be improved include, but are not limited to, mechanical, baggage systems, electrical, plumbing, elevators, fire suppression, and emergency lighting.



T13: Hardstand Parking – This project includes the programming, design, and construction of new airfield pavement south of Terminal 4 for 8 remain overnight (RON) parking positions for narrowbody aircraft along the mechanically stabilized earth (MSE) wall. This project will help meet current and future aircraft parking needs and restore the existing aircraft parking positions displaced by Terminal 5.



T14: Utility Improvements (Consolidated Utility Duct Bank) – Phase 1 – Terminal 4 – This project includes the programming, design, and construction of a consolidated utility duct bank. Phase 1 of this project will take place during the MPU’s Terminal Expansion Phase 1 project (T20). This project is necessary to reduce existing and potential costs associated with iterative utility capacity enhancements and maintenance improvement projects. These utility improvements will allow for much needed capacity enhancements to occur while relocating utility lines within a consolidated duct bank to minimize operational disruption during future utility modifications.



T18: Airfield Improvements Associated with the MPU’s Phase 1 Terminal Expansion – This project includes the programming, design, and construction of airfield pavement improvements, including the placement of pavement in several grass taxiway islands to provide an expanded apron. The expanded apron is needed for the Terminal Expansion Phase 1 project (T20). Taxiways and taxilanes will be decommissioned in the process and aircraft RON positions will be relocated adjacent to the MSE wall (T13).



T20: Terminal Expansion Phase 1 (Concourse G West Expansion) – This project includes the programming, design, and construction of an expansion of Terminal 4 to the west to provide 11 additional gates, for an overall airport wide total of 77 aircraft gates. The gates will accommodate up to ADG V aircraft, with five of the gates constructed as multiple apron ramp system (MARS) positions. MARS positions provide a 2 for 1 narrowbody to widebody swap. The new concourse will be fully international capable with a mezzanine level sterile corridor. This expansion will also provide for new ticket counters, TSA security lanes, and a relocated and expanded FIS. These additional gates will provide the airport with operational flexibility by accommodating additional international arrivals. Additional airport gates and pre/post passenger processing facilities are required during the planning horizon to meet anticipated passenger demands.

Security



S2: Gate 100 Relocation and Expansion - This project includes the programming, design, and construction of the relocation and expansion of Gate 100, the Airport's main Air Operations Area (AOA) access gate. The expanded Gate 100 will ease congestion in the northeast quadrant of the Airport. The existing Gate 100 security gate presently experiences escort queue delays in excess of 30 minutes which often block access to the belly cargo docks located to the west of Gate 100.



S3: South AOA Gate (Gate 504) - This project includes the programming, design, and construction of the existing Gate 504 which will be impacted by the construction of the 5GT (T5). This project involves the relocation and improvement to Gate 504 on the southside of the Airport to connect to the new access road servicing the 5GT (T5). Maintaining the airside access on the south side of the Airport allows vehicles servicing Terminal 4 or other southern locations a convenient access point without having to utilize Gate 100 on the northside of the Airport.

Machinery, Equipment, and Vehicles



M12: Fuel Farm Expansion (Short-term) and Oil/Water Separator - This project includes the programming, design, and construction of two new fuel storage tanks with a capacity of 1.5 million gallons each on the existing fuel farm parcel. Also included in this project is the construction of a fuel testing lab totaling 10,000 square feet, equipment upgrades, and an oil/water separator. The current capacity of the fuel farm is 4.6 million gallons. The intent of the project is to provide the Airport with a 7-day fuel reserve to reduce the effect of any possible disruption in the fuel supply chain due to lack of nearby storage capacity and proximity to refineries.

Parking



P5: Palm Garage Redevelopment - This project includes the programming, design, and construction of a 7 to 9-level parking garage on the existing site of the Palm Garage, providing approximately 3,400 to 3,700 parking spaces. A ground transportation center will occupy Level 1, providing approximately 2,100 linear feet of curb front. This project is needed to provide vehicular parking to accommodate forecast demand at 42 million annual passengers.

8.2.1.1 Phase 1 Rough Order of Magnitude Cost Estimates

The estimated ROM project costs reflect a preliminary opinion of the probable implementation costs for each project, including construction, design fees, soft costs, and a contingency for each project. The estimated ROM project costs for the MPU Phase 1 projects were developed using 2018 U.S. dollars.

Soft costs include construction support services, work site services, permitting costs, testing and inspections, construction management (CM) /project management (PM) consulting services, and commissioning. Soft costs for each of the areas mentioned above will vary depending on the scope and/or complexity of a project. As such, an average soft cost allowance of 16 percent was used for each of the MPU Phase 1 projects. Below is a summary of the three primary cost allowances applied to the MPU Phase 1 project cost estimates.

- Architectural and engineering (A/E) design fee and construction administration services: 9 percent
- Soft costs: 16 percent
- Owner /program contingency: 20 percent

As the project advances through the implementation stages, capital costs in this document should be viewed only as planning-level estimate subject to further refinement during design, as the scope for the project is confirmed or refined. **Table 8.2-2** presents the ROM costs for the MPU Phase 1 projects as well as the projects contained in BCAD's ACIP.

8.2.2 MPU PHASE 2 AND PHASE 3 PROJECTS

The MPU Phase 2 and Phase 3 projects include those necessary to meet demand associated with PAL 3. The Phase 2 and Phase 3 projects have been tentatively deferred to beyond FY 2034 due to project need/demand triggers, and cost, which are further discussed in Section 8.4. The Phase 2 and Phase 3 CIP projects are illustrated on **Exhibit 8.2-2** and are listed along with project dependencies in **Appendix L**.

The Phase 2 and Phase 3 projects are conceptually identified on the Airport Layout Plan (ALP) to protect the required development area and surrounding airspace necessary to accommodate demand associated with PAL 3. As previously mentioned, the remainder of this section, including the implementation and sequencing and financial analysis will focus on the MPU Phase 1 projects.

8.3 Phase 1 Implementation and Sequencing

8.3.1 FACTORS AFFECTING IMPLEMENTATION AND SEQUENCING

Implementation of the CIP should be based on actual and trending demand, considering both magnitude and characteristics, and the need to provide additional capacity over the planning horizon. Ideally, projects will be implemented with adequate time to accommodate demand, but not so early resulting in facilities that would be underutilized or not financially feasible. Similarly, management and operational policies can drive the optimization of facility utilization, influencing the scope and timing of future development, potentially altering the timing of development actions by allocating available capacity in a manner that optimizes and balances the use of existing facilities.

The ability to time implementation decisions correctly requires an understanding of the factors that trigger facility development, ongoing data monitoring and analysis to identify when actions should be taken, recognition of regulatory changes or policy implications, and an organizational structure and process to implement project planning and construction when demand dictates. Focused planning and programming as intermediate steps are critical, as projects must be refined and adjusted as warranted prior to the start of design and construction. Likewise, the timing of necessary environmental processing must be considered to ensure that project implementation is not adversely impacted. In timing implementation, the financial implications of development decisions, both individually and in the context of other development actions and investment needs, must also be considered.



Table 8.2-2 (1 of 2): Capital Improvement Program Cost by Project

PROJECT ID ^{1/}	PROJECT DESCRIPTION	ROUGH ORDER OF MAGNITUDE COSTS (IN 2018 DOLLARS, ROUNDED)
Master Plan (Phase 1) Projects		
General and Administrative		
G2	Professional Services for Master Plan	\$31,921,600
G11	Commercial Center (Phase 1)	\$87,198,800
G11	Airport Hotel	\$161,958,700
G12	Intermodal Center (Transit Center, 4,500 - space Garage) Phase 1	\$168,765,500
G14	Supplemental Curb (Includes Demo of Palm Garage)	\$36,180,000
G16	Aircraft Rescue and Firefighting (ARFF)	\$26,568,600
G16	Consolidated BCAD Operations Facility	\$10,671,200
G17	Belly Cargo Facility Expansion	\$12,195,800
G18	Airport Maintenance Expansion ALLOWANCE	\$23,539,700
G20	U.S. Customs and Border Protection Relocation (Includes Airside Ramp)	\$11,296,000
G21	Central Utility Plant (Central Chiller Plant)	\$117,426,100
G22	Centralized Receiving and Distribution Facility	\$17,064,800
Airfield		
A4	Airfield Electrical Vault	\$4,732,500
A5	Taxilane (ADG III) Serving Westside Parcels	\$14,274,200
A6	Taxiway H Extension	\$5,583,000
A7	Enabling In-Kind Hangar Replacement (Taxiway H)	\$7,969,200
A8	Crossfield Taxiway	\$16,687,200
Terminal		
T5	5-Gate Terminal 5	\$96,921,200
T7	Automated People Mover (APM) Circulator	\$430,449,000
T12	Terminal 4 Expansion Dependencies and Code Compliance Improvements	\$74,918,900
T13	Hardstand Parking ^{2/}	-
T14	Utility Improvements (Consolidated Utility Duct Bank) Phase 1 - Terminal 4	\$20,659,900
T18	Airfield Improvements associated with MPU Terminal Expansion Phase 1	\$87,390,300
T20	Terminal Expansion Phase 1 (Concourse G West Expansion)	\$598,358,400
T20	Terminal Expansion Phase 1 (Processing)	\$260,857,600
T20	Terminal Expansion Phase 1 (T4 FIS)	\$202,444,700
Security		
S2	Gate 100 Relocation and Expansion	\$9,435,200
S3	South AOA Gate (Gate 504) ^{2/}	-
Machinery, Equipment, Vehicles, and Other		
M12	Fuel Farm Expansion (Short-Term) & Oil/Water Separator	\$56,330,500
Parking		
P5	Palm Garage Redevelopment	\$180,860,000
Total Master Plan (Phase 1) Project Costs		\$2,772,658,600
Airport Capital Improvement Plan Projects		
General and Administrative		
G1	Airport Access Roadway System (Short-Term Landside Improvements)	\$10,000,000
G3	Facility Improvement Allowance	\$3,386,300
G4	Noise Mitigation (RSI) Non AIP Eligible Costs	\$175,000,000
G5	Land Acquisition for Facility Support	\$19,323,700
G6	Naval Air Station Museum	\$439,600
G7	Stormwater Upgrades	\$12,122,100
G8	On-Call Planning Services	\$2,257,500
G9	Update IT Communications Master Plan	\$483,100
G10	Land Acquisition 2	\$6,932,400
G19	Bus Lot Staging and Maintenance	\$5,248,800



Table 8.2-2 (2 of 2): Capital Improvement Program Cost by Project

PROJECT ID ^{1/}	PROJECT DESCRIPTION	ROUGH ORDER OF MAGNITUDE COSTS ^{2/}
Airfield		
A1	RTR Relocation	\$4,709,000
A3	Taxilane T Construction	\$6,996,500
Terminal		
T1	T4 Federal Inspection Services (FIS)	\$138,671,500
T2	T4 Checked Baggage Inspection System (CBIS)	\$45,292,000
T3	T4 Concourse G (includes T4 Ramp)	\$483,161,800
T4	Terminal Connectors (T 1, 2, 3, 4)	\$147,670,200
T9	Baggage Handling System Software Upgrades	\$3,361,400
T11	T1 Concourse B and C Exterior Windows Replacement	\$1,710,100
T10	T1 CBRA Room Improvements	\$6,470,600
T10	Terminal Modernization Project	\$236,963,100
T24	Terminal 1 - Roofing Improvements (ALLOWANCE)	\$4,527,100
T25	Terminal 2 - Roofing Improvements (ALLOWANCE)	\$2,716,200
T26	Terminal 3 - Roofing Improvements (ALLOWANCE)	\$3,499,200
T27	Terminal 4 - Roofing Improvements (ALLOWANCE)	\$2,624,400
Security		
S1	Life Cycle Replacement of Cameras, NVRs, & Storage Devices	\$2,086,000
S4	Passenger Screening Lanes	\$16,424,000
Machinery, Equipment, Vehicles, and Other		
M1	Passenger Boarding Bridges (39) Replacement	\$40,415,500
M2	IS Hardware Renewal and Replacement	\$7,828,300
M3	Equipment Replacement	\$7,828,300
M4	Long-term Infrastructure Equipment Replacement	\$11,516,900
M5	Equipment - New	\$126,600
M6	Vehicle Replacement	\$1,979,300
M7	Vehicles - New	\$193,200
M8	Mobile Application Development	\$1,128,800
M9	IT Comm Room Improvements	\$759,900
M10	Radio Replacement	\$2,954,600
M11	Emergency Mass Notification System	\$724,600
Parking		
P1	Rehabilitation of RCC, Hibiscus & Palm Garages	\$20,347,800
P2	Parking Revenue Control System Upgrade	\$1,296,100
P3	Remote Parking Lot Expansion	\$1,200,000
Total Airport Capital Improvement Plan Project Costs		\$1,440,376,500
Total Project Costs		\$4,213,035,100

NOTES:

1/ A - Airfield; G - General and Administrative; M - Machinery, Equipment, Vehicles, and Other; P - Parking; S - Security; T - Terminal.

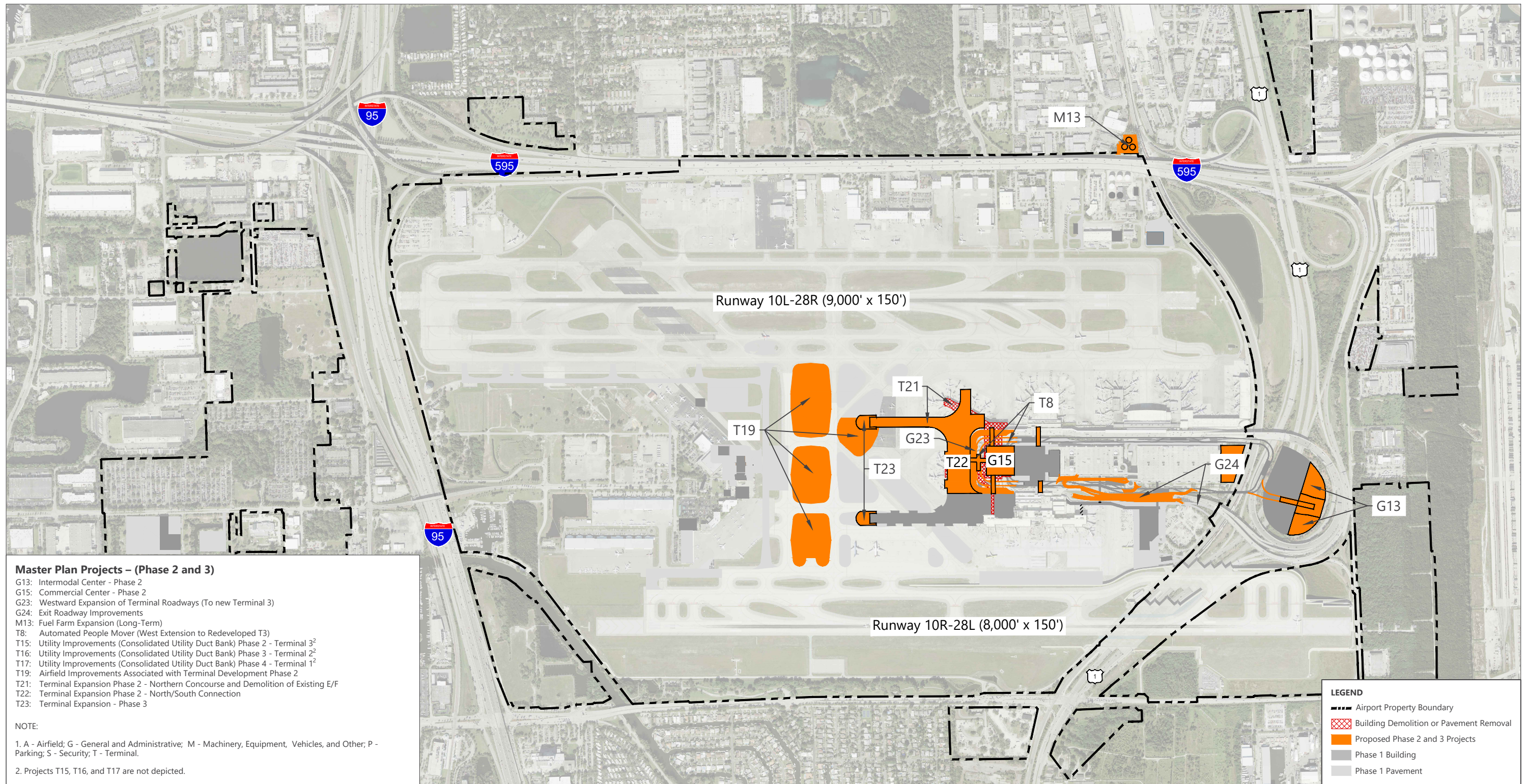
2/ ROM costs included in Project T5, 5-Gate Terminal.

SOURCES: Broward County Aviation Department, October 2018, (5-Year Capital Improvement Plan); ACAI Associates, Inc., October 2018 (Master Plan Cost Estimates); Craven Thompson & Associates, Inc., October 2018 (Master Plan Cost Estimates); Ricondo & Associates, Inc., March 2019.

PREPARED BY: Ricondo & Associates, Inc., March 2019.



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Master Plan Projects – (Phase 2 and 3)

- G13: Intermodal Center - Phase 2
- G15: Commercial Center - Phase 2
- G23: Westward Expansion of Terminal Roadways (To new Terminal 3)
- G24: Exit Roadway Improvements
- M13: Fuel Farm Expansion (Long-Term)
- T8: Automated People Mover (West Extension to Redeveloped T3)
- T15: Utility Improvements (Consolidated Utility Duct Bank) Phase 2 - Terminal 3²
- T16: Utility Improvements (Consolidated Utility Duct Bank) Phase 3 - Terminal 2²
- T17: Utility Improvements (Consolidated Utility Duct Bank) Phase 4 - Terminal 1²
- T19: Airfield Improvements Associated with Terminal Development Phase 2
- T21: Terminal Expansion Phase 2 - Northern Concourse and Demolition of Existing E/F
- T22: Terminal Expansion Phase 2 - North/South Connection
- T23: Terminal Expansion - Phase 3

NOTE:

1. A - Airfield; G - General and Administrative; M - Machinery, Equipment, Vehicles, and Other; P - Parking; S - Security; T - Terminal.
2. Projects T15, T16, and T17 are not depicted.

LEGEND

- Airport Property Boundary
- Building Demolition or Pavement Removal
- Proposed Phase 2 and 3 Projects
- Phase 1 Building
- Phase 1 Pavement

SOURCE: Broward County Aviation Department, 2019 (Aerial Photography); Ricondo & Associates, Inc., March 2019.
 PREPARED BY: Ricondo & Associates, Inc., March 2019.

EXHIBIT 8.2-2



Master Plan Projects (Phases 2 and 3)

Drawing: P:\Project\Miami\BCAD\2015 Master Plan Updates\01 - FLL Tasks\I-5 CIP Formulation\CAD\Preferred Airport Development Plan - Phase 2.dwg\Layout: 5.2-2 Phase 2 Plotted: Nov 4, 2020, 09:22AM



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The following specific criteria were adopted to guide the implementation and sequencing of individual Phase 1 projects:

- Do not exceed a maximum \$350 to \$400 million annual construction spend rate based on feedback received from BCAD considering affordability and capacity (in terms of resources and the ability to preserve ongoing airport operations) to deliver the program
- Financial affordability considerations - Specific metrics analyzed include cost per enplaned passenger, debt service coverage, and impacts to airline rates and charges
- Identification of demand-driven, incremental units of development, each possessing independent utility

Other general factors affecting implementation and sequencing provided for BCAD's consideration throughout project development are summarized in the subsequent sections.

8.3.1.1 Regulatory Requirements and Technological Changes

Changes in technology, passenger and baggage processing, airline operating policies and procedures, and security requirements need to be considered in evaluating implementation decisions and timing, including current trends toward self-bag tagging, security inspection process improvements, automated international arrivals passenger processing, and related technologies for passengers and baggage processing. Technological changes can influence the specific facility requirements under consideration, with the potential to alter the size, capacity, or configuration of specific improvements. Similarly, regulatory changes can alter the scope or configuration of recommended improvements or, alternatively, introduce the need for previously undocumented or undefined improvements.

8.3.1.2 Relocation and Replacement of Displaced Facilities

While the MPU and associated CIP includes expansion and development of areas to meet various needs, the future expansion of the terminal facilities and the airfield to meet specific demand will affect existing buildings and/or displace facilities. For example, the existing airfield electrical vault and aircraft rescue and firefighting (ARFF) facilities will be demolished and replaced at new locations to provide space for the MPU's recommended terminal expansion necessary to accommodate passenger demand. Therefore, detailed planning, design, and phasing analyses are necessary to ensure that the operational impacts of any facility relocations or replacements are minimized, defined, and communicated.

8.3.1.3 Implementation Indicators

Various development projects will be triggered by certain levels and characteristics of activities. These "indicators" signal the impending need for additional or modified facilities given existing and future demand/capacity relationships. Likewise, improvements to certain Airport facilities can trigger subsequent improvements to maintain the desired balance among airfield, terminal, landside, and support facilities.

Airfield Indicators

Several indicators can trigger the need for additional airfield capacity. The most prominent indicators are average aircraft delay and annual service volume. The airfield demand/capacity analysis presented in Section 4.2.4

determined that the existing runway system is adequate to accommodate existing and future operational demand at the Airport throughout the 20-year planning horizon.

In addition to airfield capacity, airfield projects can be driven by changing design standards and aircraft types (e.g. airline fleet changes), aging pavements, or for purposes of providing access to expanded or new areas of development. Several airfield projects are included in the CIP to accommodate growth associated with the expansion of terminal facilities. These projects are needed to reconfigure taxiways and taxilanes to provide an efficient flow of aircraft and aircraft parking positions.

Terminal/Gate Indicators

The timing for terminal/gate expansion or development is based on passenger and aircraft operations demand growth, technology changes that influence passenger processing, BCAD's use and lease policies, and the desired level of service for customers. Indicators related to terminal capacity include:

- excessive delays in passenger processing (security screening or international arrivals)
- reduced passenger levels of service (congestion, baggage claim delivery times, etc.)
- increased levels of sustained gate use (with limited time or ability to recover from irregular operations)
- operational delays resulting from aircraft gate occupancy (particularly relating to aircraft upgauging)

In planning for future terminal facilities, airline characteristics, such as differences in operating approaches between low-cost and mainline carriers, aircraft fleet and load factors, and aircraft seat capacity must be considered. Several projects are included in the MPU to address demand for terminal space and gates.

Roadway Indicators

As the Airport evolves to accommodate future demand, landside infrastructure must be evaluated to ensure adequate capacity with an acceptable level of service exists. The evaluation should consider the various modes of transportation that passengers, visitors, tenants, ground transportation service providers, and employees utilize to access the Airport and terminal core. The roadway capacity must evolve to accommodate the anticipated demand while minimizing congestion and providing a suitable level of service. The current roadway areas experience congestion during peak periods and therefore, several roadway improvements have been recommended to meet existing and future landside demand.

Other Ground Transportation Indicators

Ground transportation indicators extracted from existing BCAD parking access and revenue control systems include rate of growth, type of growth, and the introduction or maturation of other forms/modes of transportation to the Airport. Airport management and operating policies will influence the indicators for additional parking development, particularly as off-Airport parking facilities or alternative access modes may emerge/grow to temper the demand for additional on-Airport parking. Additional parking capacity alternatives have been identified and proposed parking has been recommended to meet forecast demand. A redeveloped parking structure with ground transportation improvements, an Intermodal facility with multiple levels of vehicular parking, additional parking structure and an APM have been recommended to accommodate anticipated ground transportation demand.

General Aviation Indicators

The numbers of private and corporate based aircraft are indicators of the potential need for GA facilities development. Tenant demand typically signals the need for additional GA facilities. Fixed base operator (FBO) business models, investments, and customer base can influence the demand for GA facility growth. Similarly, growth in the number of GA aircraft operations and based aircraft indicate the need to initiate planning for hangar or apron expansion. The expansion of GA facilities also depends on the amount of activity and demand accommodated by reliever and GA airports in the vicinity of FLL. Areas which provide landside and airside access for GA activity and facilities have been reserved in the western portion of the airport.

Cargo Indicators

Cargo facility development is driven largely by tenant demand. BCAD can anticipate demand and planning for cargo tenant expansion at the Airport by assessing the growth of cargo tonnage, cargo aircraft operations, and fleet mix. Regulations, such as the requirements for cargo security screening, will also influence the need for and timing of cargo and related facilities. Future cargo development by a new entrant can trigger the need for improvements in the airfield, roadway network, and other inter-related development. There are several areas north of Runway 10L-28R that will accommodate either a new entrant or the expansion of an existing operation. It is anticipated that this development will be implemented and paid for by the tenant or a third-party developer.

Support Facilities Indicators

Airline fleets and equipment, food service, ground service equipment, maintenance activities, and other factors have the potential to affect the demand for support facilities. Given the diversity of support facilities, there can be substantial variation in the associated development triggers. Consistent communication and maintaining awareness of facility utilization, changes in tenant operations, and other metrics will help ensure the efficient implementation of support facilities.

Several support facility recommendations for the northeast quadrant of Airport property have been identified. The recommendations include the addition of new support facilities in the northeast quadrant, relocation/repurposing of existing facilities, and expansion of existing facilities needed to accommodate future requirements.

8.3.1.4 Financial Factors

Consideration of financial factors is critical when developing a realistic CIP that will allow the Airport to meet future demand and development goals. If a project is not financially feasible, it could be deferred until a later date, or an alternative means of meeting a project's objective and function may be pursued by the Airport. Financial factors, including affordability and impacts to key metrics such as cost per enplaned passenger (CPE), cash flow, debt-service, and airline rates and charges, are factors that should be considered when evaluating the implementation and sequencing of projects.

The availability of funding is a factor when evaluating the affordability and timing of projects. Adjustments to project sequencing and scope may be necessary to develop projects that meet the desired goals and are financially feasible.

8.3.1.5 Volume and Character of Growth

Monitoring activity levels will provide BCAD with insight into the appropriate implementation decisions and sequencing related to project programming, planning, design, and construction. Actual activity should be compared to the activity forecasts presented in Section 3 of the MPU (or subsequent forecasts) to determine whether demand is nearing or exceeding the capacity of specific airport facilities, also factoring in an allowance for the necessary project enabling work.

8.3.2 PHASE 1 SEQUENCING

The MPU Phase 1 projects are further separated into five sequences which reflect the timing of implementation based on anticipated demand, project dependencies, affordability, and available funding. As previously mentioned, the timing of each project in the sequences should be periodically reevaluated and aligned to account for changes in the industry, the region, and at the Airport. The Phase 1 implementation sequences are presented in **Table 8.3-1** and illustrated on **Exhibit 8.3-1** through **Exhibit 8.3-5**. Phase 1 ROM costs are escalated at a rate of 3.5 percent annually to account for inflation and its effect on the changing costs of construction, engineering, construction management/administration, and other expenditures. The escalation rate was adopted in close coordination with BCAD staff and reflects a conservatively higher than average rate for added contingency for long-term uncertainties (typically 3 percent is used in the planning phase).

8.3.3 PHASE 1 PRELIMINARY IMPLEMENTATION SCHEDULE

An implementation schedule is a useful tool to assist in visualizing individual project elements such as advanced planning/programming, design, and construction, along with their associated durations. It can also highlight the number of projects occurring during the same time period to aid in coordination funding requests, procurements, resource planning, and discussions to minimize operational impacts. **Table 8.3-2** presents the preliminary implementation schedule including a breakdown of the timing of each project by phase (Project Definition Document (PDD) and environmental documentation, design, and construction), project triggers, and dependencies.

8.3.4 PROJECT TIMING CONSIDERATIONS

At the request of BCAD, the following project development progression was created to guide future implementation planning. For aviation development projects to be successfully completed without undue delay, projects must be programmed and vetted well in advance of anticipated construction. Obtaining stakeholder buy-in early in the process is an effective means of ensuring a smooth project, and it limits the possibility that projects compete for limited resources. Environmentally sensitive projects, complex projects, and projects delivered via alternative delivery methods will require extra time to procure, while smaller projects can typically be designed and constructed within shorter timeframes. The following timeline should be considered as a guide when planning and programming Airport development projects¹.

¹ Adapted from Federal Aviation Administration, Checklist for Typical AIP Development Projects, https://www.faa.gov/airports/central/airports_resources/media/checklist_AIP_development.pdf (accessed July 19, 2019).

Table 8.3-1: Phase 1 Implementation Sequencing

SEQUENCE	PROJECT ID ^{1/}	PROJECT DESCRIPTION	ESTIMATED PROJECT TIMING (FISCAL YEAR) ^{2/}	ROUGH ORDER OF MAGNITUDE COSTS (ESCALATED, ROUNDED) ^{3/}
Sequence 1				
	G2	Professional Services for Master Plan	2020 - 2023	\$35,000,000
	G12	Intermodal Center (Transit Center, 4,500 - space Garage) Phase 1	2020 - 2022	\$189,800,000
	G14	Supplemental Curb (Initial Palm Garage Demolition)	2021 - 2024	\$42,500,000
	M12	Fuel Farm Expansion (Short-Term) & Oil/Water Separator	2025 - 2026	\$73,900,000
	S3	South AOA Gate (Gate 504) ^{4/}	2020 - 2023	-
	T5	5-Gate Terminal 5 (as remote gates) ^{4/}	2020 - 2023	\$109,300,000
	T7	Automated People Mover (APM) Circulator - Initial Segment	2021 - 2026	\$526,000,000
	T13	Hardstand Parking ^{4/}	2020 - 2023	-
Sequence 2				
	A4	Airfield Electrical Vault	2024 - 2025	\$6,000,000
	A5	Taxilane (Airplane Design Group (ADG) III) Serving Westside Parcels	2021 - 2022	\$16,100,000
	G11	Commercial Center	2022 - 2025	\$105,800,000
	G11	Airport Hotel	2022 - 2025	\$196,500,000
	G14	Supplemental Curb (Includes Demolition of Palm Garage)	2021 - 2024	\$42,500,000
	G16	Consolidated BCAD Operations Facility	2021 - 2022	\$12,200,000
	G17	Belly Cargo Facility Expansion	2025 - 2026	\$16,000,000
	G21	Central Utility Plant (Central Chiller Plant)	2022 - 2026	\$148,100,000
	G22	Centralized Receiving and Distribution Facility	2023 - 2024	\$20,900,000
	P5	Palm Garage Redevelopment	2022 - 2025	\$222,600,000
	S2	Gate 100 Relocation and Expansion	2024 - 2025	\$12,000,000
	T7	Automated People Mover (APM) Circulator	2021 - 2026	\$526,000,000
	T12	Terminal 4 Expansion Dependencies and Code Compliance Improvements	2021 - 2025	\$91,300,000
Sequence 3				
	A7	Enabling In-Kind Hangar Replacement	2029 - 2030	\$12,000,000
	T14	Utility Improvements (Consolidated Utility Duct Bank) Phase 1 - Terminal 4	2027 - 2029	\$30,000,000
	T18	Airfield Improvements associated with MPU Terminal Expansion Phase 1	2025 - 2029	\$122,200,000
	T20	Terminal Expansion Phase 1 (Concourse G West Expansion)	2025 - 2029	\$826,000,000
	T20	Terminal Expansion Phase 1 (Processing)	2025 - 2028	\$349,800,000
Sequence 4				
	A6	Taxiway H Extension	2030 - 2031	\$8,700,000
	G16	Aircraft Rescue and Firefighting (ARFF)	2029 - 2030	\$40,000,000
	G18	Airport Maintenance Expansion (ALLOWANCE)	2027 - 2029	\$33,600,000
	G20	General Aviation Customs Relocation (includes Airside Ramp)	2030 - 2031	\$17,600,000
Sequence 5				
	A8	Crossfield Taxiway	2030 - 2031	\$26,000,000
	T20	Terminal Expansion Phase 1 (T4 FIS)	2032 - 2034	\$339,300,000
			Total Project Costs	\$4,197,700,000

NOTES:

1/ A - Airfield; G - General and Administrative; M - Machinery, Equipment, Vehicles, and Other; P - Parking; S - Security; T - Terminal.

2/ Estimated project timing reflects design and construction and does not include timing associated with Project Definition Documents (PDDs) and/or environmental documentation. (NEPA compliance)

3/ Costs developed in 2018 U.S. dollars; costs have been escalated 3.5 percent annually to completion year to account for inflation.

4/ 5-Gate Terminal includes Hardstand Parking and South AOA Gate (504). Since the completion of the MPU Financial Analysis, the airlines and BCAD have agreed to construct a 5-gate Terminal 5 (with passenger and baggage processing, as well as landside access) with a \$250 million budget allowance.

SOURCES: Ricondo & Associates, Inc., May 2019.

PREPARED BY: Ricondo & Associates, Inc., May 2019.



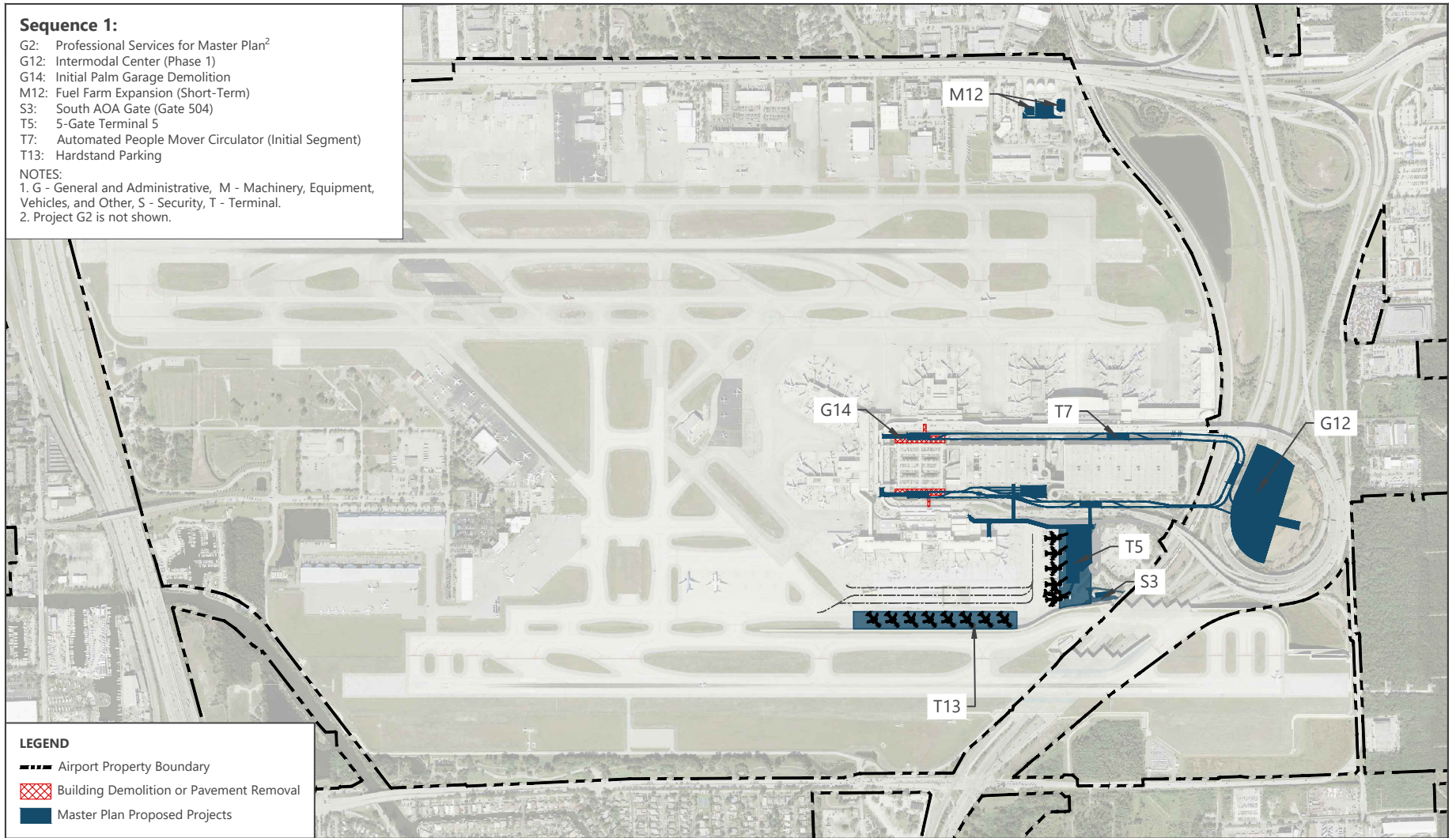
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Sequence 1:

- G2: Professional Services for Master Plan²
- G12: Intermodal Center (Phase 1)
- G14: Initial Palm Garage Demolition
- M12: Fuel Farm Expansion (Short-Term)
- S3: South AOA Gate (Gate 504)
- T5: 5-Gate Terminal 5
- T7: Automated People Mover Circulator (Initial Segment)
- T13: Hardstand Parking

NOTES:

- 1. G - General and Administrative, M - Machinery, Equipment, Vehicles, and Other, S - Security, T - Terminal.
- 2. Project G2 is not shown.



SOURCES: Broward County Aviation Department, 2019 (Aerial Photography); Ricondo & Associates, Inc., May 2019.
PREPARED BY: Ricondo & Associates, Inc., May 2019.

EXHIBIT 8.3-1



Sequence 1 Projects

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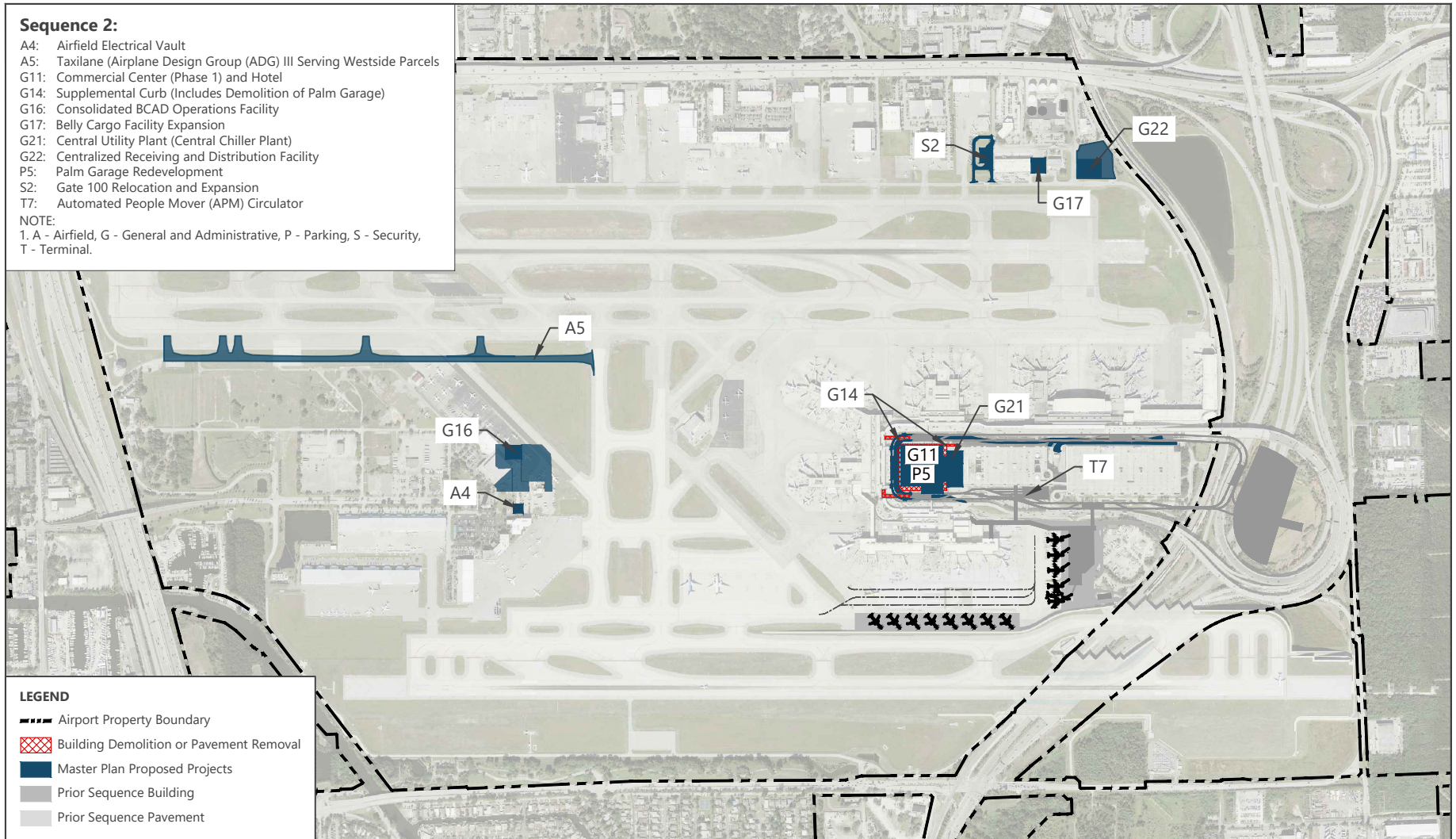
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Sequence 2:

- A4: Airfield Electrical Vault
- A5: Taxilane (Airplane Design Group (ADG) III Serving Westside Parcels)
- G11: Commercial Center (Phase 1) and Hotel
- G14: Supplemental Curb (Includes Demolition of Palm Garage)
- G16: Consolidated BCAD Operations Facility
- G17: Belly Cargo Facility Expansion
- G21: Central Utility Plant (Central Chiller Plant)
- G22: Centralized Receiving and Distribution Facility
- P5: Palm Garage Redevelopment
- S2: Gate 100 Relocation and Expansion
- T7: Automated People Mover (APM) Circulator

NOTE:

- 1. A - Airfield, G - General and Administrative, P - Parking, S - Security, T - Terminal.



SOURCES: Broward County Aviation Department, 2019 (Aerial Photography); Ricondo & Associates, Inc., May 2019.
PREPARED BY: Ricondo & Associates, Inc., May 2019.

EXHIBIT 8.3-2



Sequence 2 Projects

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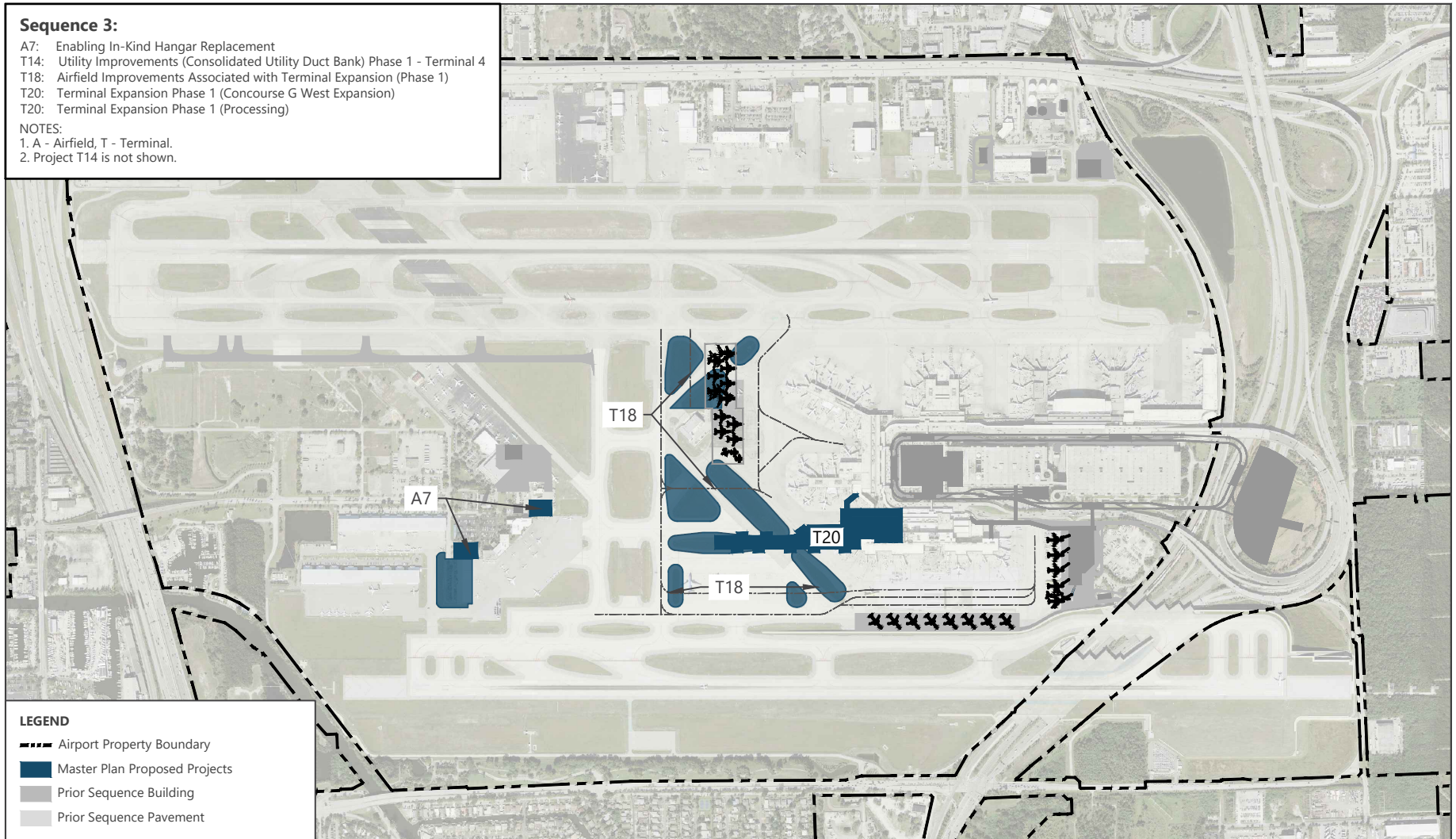
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Sequence 3:

- A7: Enabling In-Kind Hangar Replacement
- T14: Utility Improvements (Consolidated Utility Duct Bank) Phase 1 - Terminal 4
- T18: Airfield Improvements Associated with Terminal Expansion (Phase 1)
- T20: Terminal Expansion Phase 1 (Concourse G West Expansion)
- T20: Terminal Expansion Phase 1 (Processing)

NOTES:

1. A - Airfield, T - Terminal.
2. Project T14 is not shown.



SOURCES: Broward County Aviation Department, 2019 (Aerial Photography); Ricondo & Associates, Inc., May 2019.
PREPARED BY: Ricondo & Associates, Inc., May 2019.

EXHIBIT 8.3-3



Sequence 3 Projects

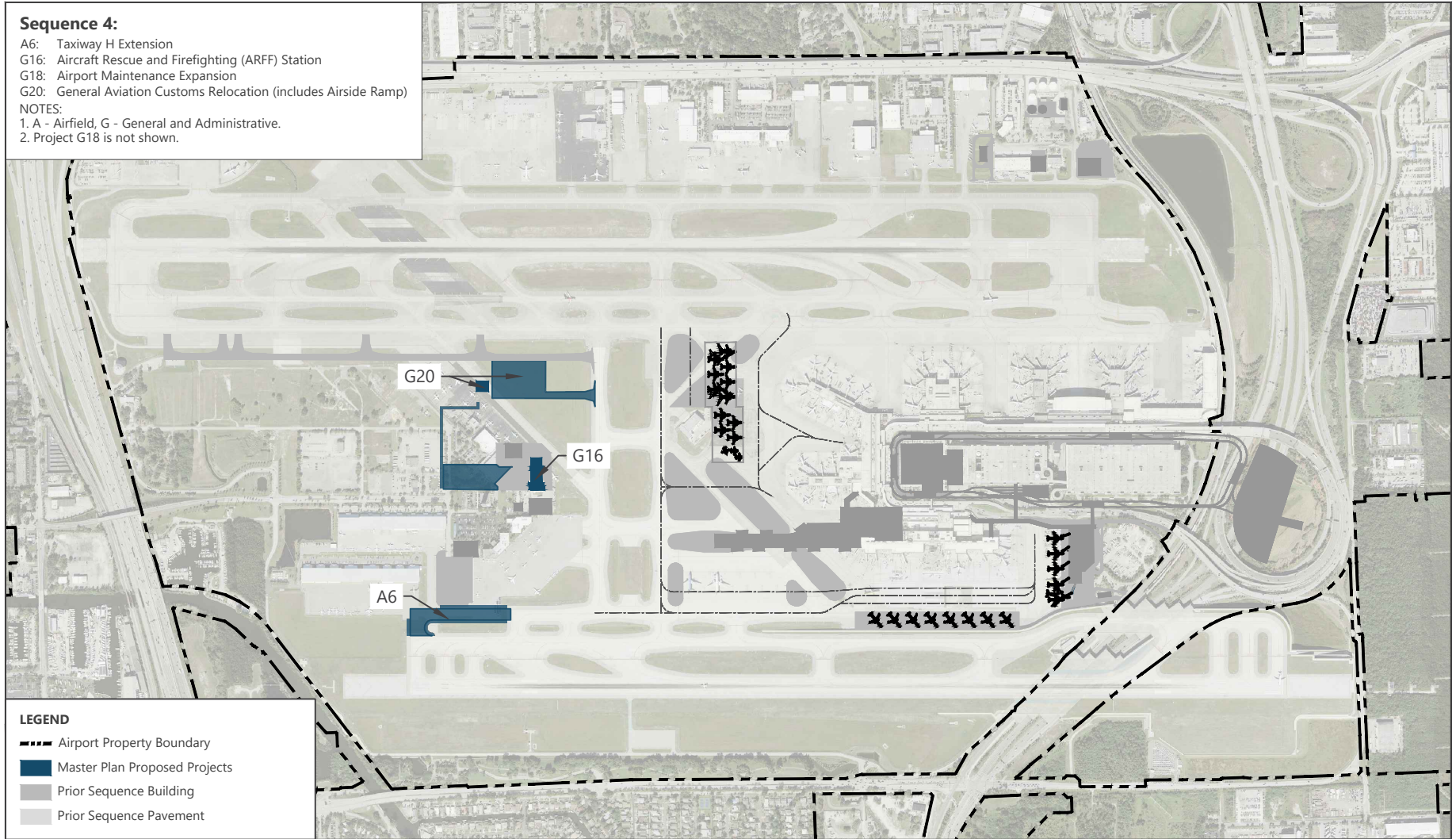
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Sequence 4:

- A6: Taxiway H Extension
 - G16: Aircraft Rescue and Firefighting (ARFF) Station
 - G18: Airport Maintenance Expansion
 - G20: General Aviation Customs Relocation (includes Airside Ramp)
- NOTES:
 1. A - Airfield, G - General and Administrative.
 2. Project G18 is not shown.



SOURCES: Broward County Aviation Department, 2019 (Aerial Photography); Ricondo & Associates, Inc., May 2019.
 PREPARED BY: Ricondo & Associates, Inc., May 2019.

EXHIBIT 8.3-4

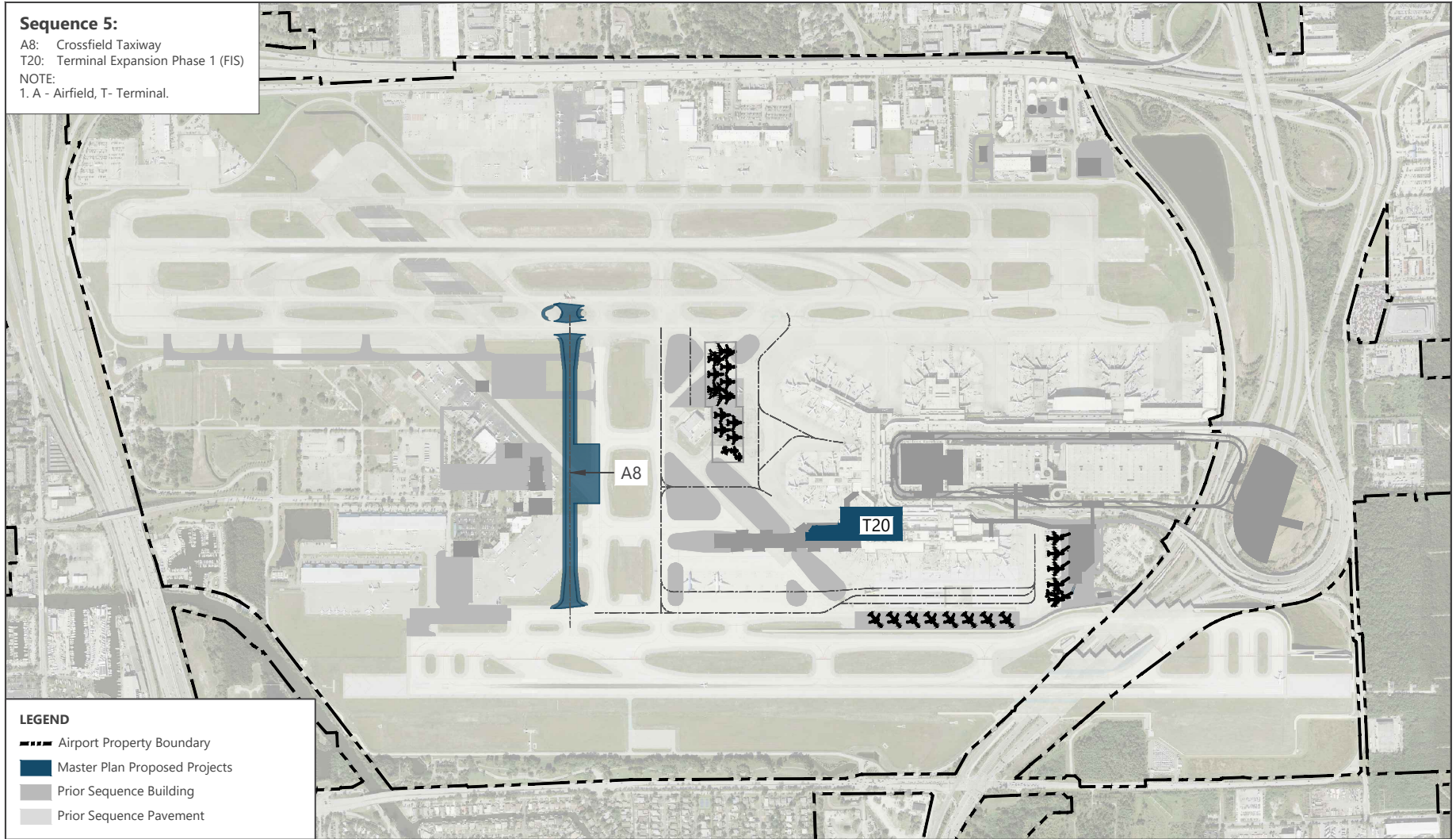
Sequence 4 Projects



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Sequence 5:

A8: Crossfield Taxiway
T20: Terminal Expansion Phase 1 (FIS)
NOTE:
1. A - Airfield, T- Terminal.



SOURCES: Broward County Aviation Department, 2019 (Aerial Photography); Ricondo & Associates, Inc., May 2019.
PREPARED BY: Ricondo & Associates, Inc., May 2019.

EXHIBIT 8.3-5



Sequence 5 Projects

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Table 8.3-2 (1 of 2): Phase 1 Preliminary Implementation Schedule

Project ID	Project Name	Project Dependency	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	FY 2029	FY 2030	FY 2031	FY 2032	FY 2033	FY 2034	Total ROM Cost (Escalated)	Trigger	Notes
T5	5-Gate Terminal 5 ^{1/}	None		*															\$ 109,256,015	Passenger demand of 37 MAP (on or before 2020).	Current RON positions west of Terminal 4 will need to be relocated to accommodate new 5-Gate Terminal.
G12	Intermodal Center (Transit Center, 4,500 - space Garage) Phase 1 ^{2,3/}	None (Outlay of Airport funds may be restricted since parcel is not owned by BCAD)		*															\$ 189,800,000	Vehicular parking demand at 37 MAP requires an additional 1,580 parking spaces. Project will also accommodate parking loss from the demolition of the Palm Garage (Project G12).	Criticality of this project from a timing standpoint could be relaxed if Palm Garage replacement parking is accommodated elsewhere or via a separate project.
A5	Taxilane (ADG III) Serving Westside Parcels ^{4/}	None																	\$ 16,100,000	Tenant driven demand for development of westside parcels.	
G14	Supplemental Curb (Includes Demo of Palm Garage) ^{3/}	G12	*																\$ 42,500,000	Immediate improvements needed to address existing LOS on arrivals curb.	Requires completion of Intermodal Center Phase 1 (G12). Extended design period tied to funding request.
T7	Automated People Mover (APM) Circulator ^{3/}	G14																	\$ 526,000,000	Project triggered at BCAD discretion.	Projects G14 and P5 are required to facilitate construction and operation of APM Circulator.
P5	Palm Garage Redevelopment ^{3/}	G12/G14																	\$ 222,600,000	Vehicular parking demand at 42 MAP (on or before 2025) requires an additional 1,220 parking spaces.	Projects G12 and G14 required to facilitate Palm Garage Redevelopment.
G16	Consolidated BCAD Operations Facility (Public Safety Building)	A4																	\$ 12,200,000	Project triggered at BCAD discretion once location becomes available.	Development will take place on a shared parcel with the relocated ARFF.
T12	Terminal 4 Expansion Dependencies and Code Compliance Improvements	T20																	\$ 91,300,000	Prior to terminal expansion phase 1, terminal 4 must be improved to comply with current county building codes.	
T20	Terminal Expansion Phase 1 (Concourse G west expansion)	ALP Approval/T12																	\$ 826,000,000	Passenger demand of 42 MAP (on or before 2025)	Projects T12, T14 and T18 are required for the Terminal Expansion Phase 1.
T20	Terminal Expansion Phase 1 (Processing)	T12/T14/T20																	\$ 349,800,000	Project triggered at BCAD discretion. Terminal 3 and 4 processing LOS' should be monitored to maintain acceptable levels once passenger wait times or queues extend beyond optimal levels.	
T20	Terminal Expansion Phase 1 (T4 FIS)	T20																	\$ 339,300,000	Project triggered at BCAD discretion. Terminal 3 and 4 processing LOS' should be monitored to maintain acceptable levels once passenger wait times or queues extend beyond optimal levels terminal expansion projects. Requires the construction of lower levels (FIS on mezzanine levels).	
G21	Central Utility Plant (Central Chiller Plant)	P5/G12/G14																	\$ 148,100,000	Project triggered at BCAD discretion. If developed facility should be available prior to new facilities coming online to avoid new and/or expanded individual chiller plants.	
T18	Airfield Improvements associated with Terminal Development Phase 1 ^{5/}	None																	\$ 122,200,000	Project required to accommodate terminal gate demand at 42 MAP (on or before 2025).	
G11	Commerical Center	P5/G14																	\$ 105,800,000	Project triggered at BCAD discretion once Palm Garage Redevelopment is complete and connectivity via APM becomes available.	Commercial Center and hotel could be standalone projects. However, facility interfacing with Palm Garage redevelopment is critical, may trigger earlier development.
G11	Airport Hotel	P5/G11/G14																	\$ 196,500,000	Project triggered at BCAD discretion once Palm Garage Redevelopment is complete and connectivity via APM becomes available.	Commercial Center and hotel could be standalone projects. However, facility interfacing with Palm Garage redevelopment is critical, may trigger earlier development.



Table 8.3-2 (2 of 2): Phase 1 Implementation Schedule

Project ID	Project Name	Project Dependency	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	FY 2029	FY 2030	FY 2031	FY 2032	FY 2033	FY 2034	Total ROM Cost (Escalated)	Trigger	Notes
G22	Centralized Receiving and Distribution Facility	G16																	\$ 20,900,000	Project triggered at BCAD discretion upon relocation of existing BCAD security offices.	The building that currently houses BCAD security must be vacated prior to construction.
A4	Airfield Electrical Vault	None																	\$ 6,000,000	Enabling the construction of the Consolidated BCAD Operations Facility (Public Safety Building) and ARFF facility.	A new airfield electrical vault is needed to provide space for the construction of a new crossfield taxiway and ARFF facility.
S2	Gate 100 Relocation and Expansion	None																	\$ 12,000,000	Project triggered at BCAD discretion.	Preferred location has been identified as greenspace currently available in the Northeast quadrant. A new location would be necessary if this parcel becomes unavailable.
G17	Belly Cargo Facility Expansion	None																	\$ 16,000,000	Project triggered at BCAD discretion.	Belly cargo building expansion is to the east of the existing facility. Project cost should be covered by operators
M12	Fuel Farm Expansion (Short-Term) & Oil/Water Separator	None																	\$ 73,900,000	Current capacity is 4.6 million gallons, 9.8 million gallons required to meet future demand.	Long-term expansion would trigger the existing maintenance facilities to be relocated prior to construction if the triangular parcel is not rezoned to accommodate future tank needs.
G18	Airport Maintenance Expansion ALLOWANCE	None																	\$ 33,600,000	Project triggered at BCAD discretion. 70 parking spaces and 180,000 square feet of building needed on or before 2035.	Facility expansion on BCAD owned land west of I-95 could trigger earlier development.
T14	Utility Improvements (Consolidated Utility Duct Bank) Phase 1 - Terminal 4	T20																	\$ 30,000,000	Project triggered at BCAD discretion.	
G16	Aircraft Rescue and Firefighting (ARFF)	A4/A8																	\$ 40,000,000	Relocation triggered to enable Phase 2 Terminal Development.	Prior to Terminal Phase 2 development. After, relocation of airfield electrical vault.
A7	Enabling In-Kind Hangar Replacement (Taxiway H)	A4																	\$ 12,000,000	Relocate prior to Taxiway H extension to provide for taxiway and its associated safety areas.	Existing hangar to be replaced with two smaller hangars. The ultimate location for the new electrical vault and preliminary siting of replacement hangars should be done in concurrence.
A6	Taxiway H Extension	A7																	\$ 8,700,000	Extension needed in order to provide ATC with the ability to sequence aircraft departing on Runway 10R-28L.	
A8	Crossfield Taxiway	G20/A4																	\$ 26,000,000	Western expansion of terminal, aircraft gates, and RON positions to serve anticipated demand of 52 MAP (on or before 2035).	
G20	U.S. Customs and Border Protection Relocation (Includes Airside Ramp)	A5/A8																	\$ 17,600,000	Relocation should take place prior to displacement from relocated crossfield taxiway and its associated safety areas to provide adequate apron space to meet future anticipated demand.	

Legend:
 Project Definition Document & Environmental Documentation
 Project Delay Due to Inter-related Project Dependency or current phasing/financial plan
 Design
 Construction
 * Approximate point in time when facility capacity is needed to accommodate demand

NOTES: **Architectural Services for Master Plan is not reflected in the above implementation schedule but remains in the ACIP plan. It was originally an ACIP project with a total funding request of \$35M beginning in FY18 and ending in FY27. The project was shifted to the MPU list of projects as a result of on-going coordination with BCAD. It will be renamed Professional Services for Master Plan in the FY2020 ACIP book.

- 1/ This project includes a 5-Gate terminal, the relocation of existing RON positions and Terminal 4 bus station. 5-Gate Terminal includes Hardstand Parking and South AOA Gate (504). Since the completion of the MPU Financial Analysis, the airlines and BCAD have agreed to construct a 5-gate Terminal 5 (with passenger and baggage processing, as well as landside access) with a \$250 million budget allowance.
- 2/ A phased intermodal facility has been defined in the master plan as a means to incrementally add parking capacity without overbuilding garage capacity. It also allows BCAD to push unnecessary costs off until the capacity is required. The eastern half of the IMC (Phase 2) will be constructed as additional employee parking is required beyond 2030, or if other parking needs are identified before that time.
- 3/ Discussion with FDOT has occurred and the programming and environmental documentation for all of these projects will be funded with FY19 SIS funding for access roadway project
- 4/ Based on discussions with FDOT, the funds for the design and construction of this project have been identified from a previous project that is no longer needed (Taxiway M). It is assumed that this budget will be supplemented with bonds to meet the budget shortfall between these two projects (\$4.1M)
- 5/ The advanced planning (PDD) effort associated with this project should be included in the Terminal Expansion Phase 1 (Project T20) PDD given the project dependencies and overlap.

SOURCES: Broward County Aviation Department (BCAD) - Planning Division, February 2019; Ricondo & Associates, Inc., February 2019; ACAI Associates, Inc., August 2018 (cost estimates); Craven Thompson & Associates, Inc., August 2018 (cost estimates).
 PREPARED BY: Ricondo & Associates, Inc., September 2019.



6 Years Prior to Construction (Planning)

- Identify need for cost-benefit analysis
- Coordinate Airport needs with users and tenants
- Identify resilient design opportunities in coordination with users and tenants
- Review MPU, ALP, and Exhibit A Airport Property Map
- Clearly define the scope of the planning initiative

5 Years Prior to Construction (Advanced Planning)

- Complete PDD, including but not limited to:
 - Detailed existing conditions review, preliminary site civil analysis, advanced facility programming, and building floor plan development
 - Detailed cost estimating
 - Establish preliminary construction phasing plan
 - Identify sustainability initiatives and resilient design opportunities (see Table 7-3 for a list of prioritized initiatives that can be considered during design by BCAD or tenants), and evaluate opportunity to pursue LEED certification
- Define funding plan
 - Initial coordination with FDOT if state funding participation for proposed project is anticipated
- Complete benefit-cost analysis
- Identify environmental documentation
- Identify need for land acquisition
- Preliminary airspace evaluation
- If requesting Airport Improvement Program (AIP) funding:
 - By **February 15**, submit CIP Data Sheet showing Environmental Assessment next year, if required

4 Years Prior to Construction

- Establish scope and cost estimate based on PDD results
- Update ALP, as necessary
- Acquire land or have contract to purchase
- Initiate Disadvantaged Business Enterprise (DBE) / County Business Enterprise (CBE) plan that meets federal requirements but also supports county annual CBE goals
- Begin procurement for design services
- Determine level of NEPA documentation and begin applicable Environmental Analysis, if required
- If requesting AIP funding:
 - By February 15, submit CIP Data Sheet showing construction is 4-years out and reimbursement for necessary land acquisition

- If requesting FDOT funding:
 - Load project within JACIP, review all projects to ensure they reflect the Airport’s current CIP and prioritization

3 Years Prior to Construction

- Establish sustainable design and operational goals for the project, and define commissioning requirements and operational readiness strategies
- Revise initial project cost
- Verify DBE/CBE program approval
- Confirm AIP participation is justified
- Begin preliminary design
- If requesting AIP funding:
 - By February 15, submit CIP Data Sheet showing construction is 3-years out and project design begins the following year depending on project scope and complexity
- If requesting FDOT funding:
 - Review JACIP projects, revise accuracy of project scopes and cost estimates programmed. Participate in work program development timeline to ensure project is adopted for FDOT participation.

2 Years Prior to Construction (Design)

- Verify ALP approval and proposed development are included on the ALP and does not require pen and ink change
- Refine cost estimate
- Verify funding sources and AIP participation with the FAA
- Verify environmental clearance
- Discuss impacts to NAVAIDs and/or approach procedures with the FAA
- Begin full design development (which should include commissioning requirements and operational readiness strategies)
- If requesting AIP funding:
 - By February 15, submit CIP Data Sheet showing construction is 2-years out and project design begins the following year depending on project scope and complexity
- If requesting FDOT funding:
 - Utilize FDOT funding for design services. Coordinate with District staff as necessary to review work program and modify as necessary in preparation for construction.

1 Year Prior to Construction

- Finalize design
- Establish construction safety and phasing plan

- Review commissioning requirements and implement operational readiness strategies
- Begin permitting process
- Final submission/coordination with FAA for OE/AAA review to include construction safety and phasing plan and final airspace evaluation
- If requesting AIP funding:
 - By February 15, submit CIP Data Sheet showing construction is next year
- If requesting FDOT funding:
 - Utilize FDOT funding for design services. Coordinate with District staff to review work program and modify as necessary by Dec/Jan in preparation for construction. Coordinate with District Aviation staff in June/July to develop tentative work program.

Year of Construction

- Obtain any outstanding permits
- Discuss Safety Risk Management (SRM) with the FAA
- Solicitation and procurement of bids
- Prepare grant application and accept grant
- Implement project and monitor construction
- If requesting AIP funding:
 - By May 1, submit grant application for construction based on bid

Post Construction

- Complete and submit as-built drawings and construction close-out documents
- Update ALP and Airports Geographic Information System (AGIS) to incorporate as-built conditions
- Execute commissioning plans
- Complete final report and project closeout

8.4 Financial Analysis

This section presents a potential funding plan for implementing the ACIP and MPU Phase 1 projects recommended in the MPU. It also assesses the ability of BCAD to fund the recommended projects associated with the preferred alternatives. These projects are designed to provide the required improvements and facilities at the Airport necessary to meet the demand from FY 2020 through FY 2034 (Planning Period).

The actual implementation schedule for the various construction projects will be influenced by demand, funding availability, BCAD's priorities, and other relevant factors, and it may not correspond precisely to the schedule described in this section. For purposes of the illustrative financial analysis, a specific implementation schedule is assumed. However, it should be noted that this schedule and the resulting financial analyses are intended only to

demonstrate financial impact. Actual funding strategies and financial feasibility for each project will be determined at the time of project implementation and could vary materially.

The following actions are taken to conduct the MPU's financial analysis:

- Review the Airport's financial structure and obtain financial information.
- Compile a list of proposed capital development projects, including estimated project costs and implementation start and end dates.
- Identify potential funding sources; analyze the potential availability of funding from those sources, as applicable.
- Calculate debt service for projects funded, in part, with future bond proceeds.
- Develop projections of operating and maintenance (O&M) expenses and non-airline revenues.
- Calculate airline revenues and rates and charges to assess the impact of the projects on key financial metrics, such as airline rates and charges, CPE, and debt service coverage.

At the request of BCAD, the Planning Team delineated the capital program (ACIP plus the MPU Phase 1 projects) into a set of layers grouped together by anticipated project timing and implementation dependencies. This approach is beneficial when considering the financial affordability and cost implications of groups of projects. Layers are particularly useful when analyzing the incremental financial implication of groups of projects and their impact on the entirety of the Airport's financial position. For this analysis, seven layers were created that consist of either a group of projects or an individual project, such as the Terminal Expansion Phase 1 (T4 FIS) in Layer 5, that were determined by project timing and other implementation considerations. Based on the preliminary funding plan adopted for each CIP project, this method isolated and identified the impact each layer is anticipated to have on the Airport's key financial metrics, specifically the CPE for MPU purposes.

It is important to note that layers differentiate from project sequencing and should not be used interchangeably. As previously discussed, layering was used to illustrate the financial impacts projects would have on the Airport's key financial metrics and, therefore, were not designed to be completed in order. For example, Layer 7 contains a two fiscal year gap in project implementation between separate projects contained within the layer. In contrast, project sequencing was used to define a preliminary implementation phasing approach that BCAD could adopt to deliver all projects contained within the CIP. The sequencing provides the roadmap for logical, demand driven, incremental units of capacity enhancing development. A high-level breakdown of each of the seven layers is presented in **Table 8.4-1. Appendix M** provides a detailed summary of each layer as presented to the Airport and Airlines Affairs Committee (AAAC) on April 10, 2019. These summaries include preliminary projects costs, project sketch(es), implementation timing, and the resulting key financial metrics, including CPE, for each layer.

Table 8.4-1: Capital Improvement Program Layer Schedule

MASTER PLAN LAYER	MAJOR PROJECTS
ACIP	ACIP and Land Acquisition for Facility Support
Layer 1	5-Gate Terminal 5, Hardstand Parking, and South AOA Gate (Gate 504)
Layer 2	Professional Services for Master Plan, Intermodal Center Phase 1, APM Circulator, and Supplemental Curb
Layer 3	Palm Garage Redevelopment, Airport Hotel, and Commercial Center
Layer 4	Terminal Expansion Phase 1 (Concourse G West Expansion) & (Processing), Airfield Improvements associated with Terminal Development Phase 1, Terminal 4 Expansion Dependencies and Code Compliance Improvements, Central Utility Plant (Central Chiller Plant), and Utility Improvements (Consolidated Utility Duct Bank) Phase 1 - Terminal 4
Layer 5	Terminal Expansion Phase 1 (T4 FIS)
Layer 6	Taxilane (ADG III) Serving Westside Parcels, Airfield Electrical Vault, Gate 100 Relocation and Expansion, Fuel Farm Expansion (Short-Term) & Oil/Water Separator, and Centralized Receiving and Distribution Facility
Layer 7	Belly Cargo Facility Expansion, Airport Maintenance Expansion (ALLOWANCE), ARFF, Enabling In-Kind Hangar Replacement (Taxiway H), Consolidated BCAD Operators Facility, U.S. Customs and Border Protection Relocation (Includes Airside Ramp), Taxiway H Extension, and Crossfield Taxiway

NOTE: For fiscal years ending September 30.

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

PREPARED BY: Ricondo & Associates, Inc. July 2019.

8.4.1 AIRPORT FINANCIAL STRUCTURE

The Airport is operated through the Board of County Commissioners, represented by nine officials elected from each of the nine districts in the County, and is managed by BCAD. In addition to the Airport, the BCAD operates the North Perry Airport (HWO), collectively, the Airport and HWO are known as the Airport System. BCAD and the Airport operate on a 12-month fiscal year (FY) ending September 30.

BCAD and the airlines serving the Airport entered into a new Airline-Airport Lease and Use Agreement (Airline Agreement), effective October 1, 2011. The Airline Agreement establishes the operational and financial relationship between the Airport and the airlines that executed the Airline Agreement (Signatory Airlines.) The term of the current Airline Agreement, which has been extended through September 30, 2026, incorporates the lease and use of the terminal building and airfield and establishes a residual rate-setting methodology, described in Section 8.4.4.2.

The Airline Agreement also establishes annual rates and charges methodology for non-signatory airlines and non-airline tenant leasing space in the passenger terminals at the Airport each year. The financial projections included in this section are in accordance with the terms and conditions set forth in the Airline Agreement and assume a continuation of the rate-setting methodology set forth in the current Airline Agreement through the Planning Period.

BCAD utilizes cost centers, which include those areas or functional activities of the Airport System used for the purposes of accounting for O&M Expenses, Revenues, and Airport System Debt Service. Airport Cost Centers used in the determination of rates for rentals, fees, and charges under the Airline Agreement include:

- Airfield Cost Center. This cost center includes all debt service; all direct, indirect, and general administrative O&M Expenses; and Revenues for the Airfield. The Airfield Cost Center includes those portions of the Airport areas provided for the landing, take-off, and taxiing of aircraft, including approach and clear zones and navigation easements, as well as the fuel farm and distribution system used for jet fuel.
- Terminal Cost Center. This cost center includes all debt service; all direct, indirect, and general administrative O&M Expenses; and Revenues within the Airport system facilities and properties other than the Airfield Cost Center.

8.4.2 CIP FUNDING PLAN

Airport development is often funded by a combination of Airport generated revenue, public funds, and private investments. Most airports similar in size to FLL have a variety of available funding sources and mechanisms to fund capital projects. The funding plan presented herein does not represent a final plan of finance for the FY 2019 - FY 2023 ACIP and the MPU Phase I projects, but a conceptual financial impact of the resulting CIP (i.e. the ACIP and MPU Phase 1 projects). Additional actions are required prior to the use of some of these funding sources for specific projects. It is assumed that the costs of these projects will ultimately be funded by a combination of sources, such as federal Airport Improvement Program (AIP) grants, state grants, Passenger Facility Charge (PFC) revenues, Airport funds, proceeds from the issuance of Airport revenue bonds, and other/third party funds. **Table 8.4-2** presents the estimated funding sources for the ACIP and Phase I CIP projects. Each potential funding source is described in the following sections. It is important to note that the total escalated project costs for each of the projects listed in Table 8.4-2 includes previous costs that have been incurred during the duration of the project. This value represents the summation of all previous, current, and future funding by source for each project.

8.4.2.1 Federal Grants

The Airport and Airway Improvement Act of 1982 authorizes funding of the federal AIP from the Airport and Airway Trust Fund for nationwide airport development, airport planning, and noise compatibility planning and programs. The Airport and Airway Trust Fund is funded through user taxes on airfares, air freight, and aviation fuel.

Reauthorization of FAA AIP funding through federal fiscal year (FFY) 2018 is included in The Consolidated Appropriations Act, 2018 (the Act), the omnibus spending bill enacted on March 23, 2018. The Act provides funding from the Airport and Airways Trust Fund for AIP grants-in-aid in the total amount of \$3.35 billion for FFY 2018. For purposes of this analysis, it is assumed that the AIP will continue to be funded throughout the Planning Period at a level of at least \$3.35 billion per year.



Table 8.4-2 (1 of 3): Capital Improvement Program (CIP) Funding Sources

Based on the FY2020 budget, project costs and funding sources have changed for the following projects: Stormwater Upgrades, Total: \$42.2M, Airport Funds: \$2.3M, Bonds: \$39.9M; Terminal Modernization, Total: \$617.5M covered by bonds; Taxiway T, Total: \$8.0M, Airport Funds: \$1.0M, FAA: \$6.0M, FDOT: \$1.0M; T4 Checked Baggage, Total: \$50.7M, Bonds: \$45.4M, PFC: \$5.3M; T1 CBRA, Total: \$21.9M covered by PFC's; Passenger Boarding Bridge, Total: \$41.6M, FDOT: \$3.0M, PFC: 38.6M; 5-Gate Terminal 5, Total: \$250.0M covered by bonds.

PROJECT NAME	ANTICIPATED PROJECT START YEAR (FY)	TOTAL ESCALATED PROJECT COSTS (INCL. COST FROM PRIOR YEARS)	FUNDING SOURCES						
			FAA	FDOT	PFCs	AIRPORT FUNDS	BONDS (EXISTING DEBT)	BONDS (NEW DEBT)	TENANT OR 3RD PARTY
CIP Program Year (FY 2019 – FY 2023) (Existing and Planned Issuance + ACIP + Land Acquisition Facility Support)✓									
Land Acquisition 2	2019	\$7,000,000	\$-	\$-	\$-	\$-	\$4,970,000	\$2,030,000	\$-
Stormwater Upgrades	2019,2021	\$13,440,000	\$-	\$-	\$-	\$806,400	\$-	\$12,633,600	\$-
Long-term Infrastructure Equipment Replacement	2019	\$11,920,000	\$-	\$-	\$-	\$-	\$-	\$11,920,000	\$-
Rehabilitation of RCC, Hibiscus & Palm Garages	2019	\$20,500,000	\$-	\$-	\$-	\$1,850,000	\$6,650,000	\$12,000,000	\$-
Passenger Screening Lanes	2020-2021	\$18,000,000	\$-	\$-	\$-	\$-	\$-	\$18,000,000	\$-
T4 Concourse G (includes T4 Ramp)	2019	\$483,500,000	\$12,580,000	\$-	\$-	\$16,610	\$458,730,000	\$12,173,390	\$-
T4 Federal Inspection Services (FIS)	2019	\$139,500,000	\$-	\$-	\$-	\$-	\$90,675,000	\$48,825,000	\$-
Terminal Connectors (T 1, 2, 3, 4)	2020	\$149,000,000	\$-	\$12,000,000	\$-	\$-	\$7,000,000	\$130,000,000	\$-
Terminal 1 - Roofing Improvements (ALLOWANCE)	2020	\$5,000,000	\$-	\$-	\$-	\$-	\$-	\$5,000,000	\$-
Terminal 2 - Roofing Improvements (ALLOWANCE)	2020	\$3,000,000	\$-	\$-	\$-	\$-	\$-	\$3,000,000	\$-
Terminal 3 - Roofing Improvements (ALLOWANCE)	2021	\$4,000,000	\$-	\$-	\$-	\$-	\$-	\$4,000,000	\$-
Terminal 4 - Roofing Improvements (ALLOWANCE)	2021	\$3,000,000	\$-	\$-	\$-	\$-	\$-	\$3,000,000	\$-
Terminal Modernization Project	2019	\$249,475,000	\$-	\$-	\$-	\$14,968,500	\$-	\$234,506,500	\$-
T1 Concourse B and C Exterior Windows Replacement	2019	\$1,770,000	\$-	\$-	\$-	\$-	\$-	\$1,770,000	\$-
Noise Mitigation (RSI) AIP and Non-AIP Eligible Costs	2019 & Prior	\$175,000,000	\$137,600,00	\$-	\$34,400,000	\$3,000,000	\$-	\$-	\$-
Airport Access Roadway System (Short-Term Landside Improvements)	2019-2023	\$10,000,000	\$-	\$5,000,000	\$5,000,000	\$-	\$-	\$-	\$-
Naval Air Station Museum	2019	\$455,000	\$-	\$-	\$-	\$455,000	\$-	\$-	\$-
Update IT Communications Master Plan	2019	\$500,000	\$-	\$-	\$-	\$500,000	\$-	\$-	\$-
On-Call Planning Services	2019-2023	\$2,500,000	\$-	\$-	\$-	\$2,500,000	\$-	\$-	\$-
Facility Improvement Allowance	2019-2023	\$3,750,000	\$-	\$-	\$-	\$3,750,000	\$-	\$-	\$-
Bus Lot Staging and Maintenance	2021	\$6,000,000	\$-	\$-	\$-	\$-	\$-	\$-	\$6,000,000
RTR Relocation	2019-2020	\$5,000,000	\$-	\$-	\$-	\$5,000,000	\$-	\$-	\$-
Taxiway M Construction	2021-2022	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-
Taxilane T Construction	2021-2022	\$8,000,000	\$7,200,000	\$400,000	\$400,000	\$-	\$-	\$-	\$-
T4 Checked Baggage Inspection System (CBIS)	2019	\$45,385,000	\$-	\$-	\$45,385,000	\$-	\$-	\$-	\$-
Baggage Handling System Software Upgrades	2019	\$3,467,000	\$-	\$-	\$-	\$3,467,000	\$-	\$-	\$-
T1 CBRA Room Improvements	2019-2020	\$6,900,000	\$-	\$-	\$6,900,000	\$-	\$-	\$-	\$-
Life Cycle Replacement of Cameras, NVRs, & Storage Devices	2019	\$2,159,000	\$-	\$-	\$-	\$2,159,000	\$-	\$-	\$-
Passenger Boarding Bridges (39) Replacement	2019	\$41,550,000	\$-	\$2,908,500	\$38,641,500	\$-	\$-	\$-	\$-
Radio Replacement	2019,2023	\$3,050,000	\$-	\$-	\$-	\$3,050,000	\$-	\$-	\$-
Emergency Mass Notification System	2019	\$750,000	\$-	\$-	\$-	\$750,000	\$-	\$-	\$-
Equipment - New	2019	\$131,000	\$-	\$-	\$-	\$131,000	\$-	\$-	\$-
Vehicles - New	2019	\$200,000	\$-	\$-	\$-	\$200,000	\$-	\$-	\$-
IT Comm Room Improvements	2019-2020	\$800,000	\$-	\$-	\$-	\$800,000	\$-	\$-	\$-



Table 8.4-2 (2 of 3): Capital Improvement Program Funding Sources

PROJECT NAME	ANTICIPATED PROJECT START YEAR (FY)	TOTAL ESCALATED PROJECT COSTS (INCL. COST FROM PRIOR YEARS)	FUNDING SOURCES							
			FAA	FDOT	PFCs	AIRPORT FUNDS	BONDS (EXISTING DEBT)	BONDS (NEW DEBT)	TENANT OR 3RD PARTY	
IS Hardware Renewal and Replacement	2019-2023	\$8,775,000	\$-	\$-	\$-	\$8,775,000	\$-	\$-	\$-	
Equipment Replacement	2019-2023	\$2,260,000	\$-	\$-	\$-	\$2,260,000	\$-	\$-	\$-	
Vehicle Replacement	2019-2023	\$2,190,000	\$-	\$-	\$-	\$2,190,000	\$-	\$-	\$-	
Mobile Application Development	2019-2023	\$1,250,000	\$-	\$-	\$-	\$1,250,000	\$-	\$-	\$-	
Remote Parking Lot Expansion	2021	\$1,200,000	\$-	\$-	\$-	\$1,200,000	\$-	\$-	\$-	
Parking Revenue Control System Upgrade	2019-2022	\$1,360,000	\$-	\$-	\$-	\$1,360,000	\$-	\$-	\$-	
Land Acquisition for Facility Support	2019	\$10,000,000	\$-	\$-	\$-	\$-	\$-	\$10,000,000	\$-	
Land Acquisition for Facility Support	2019	\$10,000,000	\$-	\$-	\$-	\$-	\$-	\$10,000,000	\$-	
SUBTOTAL ACIP		\$1,461,737,000	\$159,780,000	\$20,308,500	\$131,326,500	\$57,438,510	\$568,025,000	\$518,858,490	\$6,000,000	
MPU LAYER 1										
5-Gate Terminal 5 (as remote gates only) ^{2/}	2020	\$109,256,015	\$-	\$41,467,813	\$-	\$1,200,000	\$5,000,000	\$61,588,202	\$-	
SUBTOTAL MPU LAYER 1		\$109,256,015	\$-	\$41,467,813	\$-	\$1,200,000	\$5,000,000	\$61,588,202	\$-	
MPU LAYER 2										
Professional Services for Master Plan	2020	\$35,000,000	\$-	\$-	\$-	\$-	\$2,100,000	\$32,900,000	\$-	
Intermodal Center (Transit Center, 4,500 - space Garage) Phase 1	2020	\$189,800,000	\$-	\$-	\$-	\$-	\$-	\$189,800,000	\$-	
Automated People Mover (APM) Circulator	2021	\$526,000,000	\$-	\$64,950,000	\$-	\$-	\$-	\$461,050,000	\$-	
Supplemental Curb (Includes Demo of Palm Garage)	2021	\$42,500,000	\$-	\$21,250,000	\$-	\$-	\$-	\$21,250,000	\$-	
SUBTOTAL MPU LAYER 2		\$793,300,000	\$-	\$86,200,000	\$-	\$-	\$2,100,000	\$705,000,000	\$-	
MPU LAYER 3										
Palm Garage Redevelopment	2022	\$222,600,000	\$-	\$6,700,000	\$-	\$-	\$-	\$215,900,000	\$-	
Airport Hotel	2022	\$196,500,000	\$-	\$-	\$-	\$-	\$-	\$196,500,000	\$-	
Commercial Center (Phase 1)	2022	\$105,800,000	\$-	\$-	\$-	\$-	\$-	\$-	\$105,800,000	
SUBTOTAL MPU LAYER 3		\$524,900,000	\$-	\$6,700,000	\$-	\$-	\$-	\$412,400,000	\$105,800,000	
MPU LAYER 4										
Terminal Expansion Phase 1 (Concourse G west expansion)	2025	\$826,000,000	\$-	\$16,520,000	\$-	\$-	\$-	\$809,480,000	\$-	
Terminal Expansion Phase 1 (Processing)	2025	\$349,800,000	\$-	\$6,996,000	\$-	\$-	\$-	\$342,804,000	\$-	
Airfield Improvements associated with Terminal Development Phase 1	2025	\$122,200,000	\$62,322,000	\$-	\$59,878,000	\$-	\$-	\$-	\$-	
Terminal 4 Expansion Dependencies and Code Compliance Improvements	2021	\$91,300,000	\$-	\$-	\$-	\$-	\$-	\$91,300,000	\$-	
Central Utility Plant (Central Chiller Plant)	2022	\$148,100,000	\$-	\$-	\$-	\$-	\$-	\$148,100,000	\$-	
Utility Improvements (Consolidated Utility Duct Bank) for Phase 1 - Terminal 4	2027	\$30,000,000	\$-	\$-	\$-	\$-	\$-	\$30,000,000	\$-	
SUBTOTAL MPU LAYER 4		\$1,567,400,000	\$62,322,000	\$23,516,000	\$59,878,000	\$-	\$-	\$1,421,684,000	\$-	



Table 8.4-2 (3 of 3): Capital Improvement Program Funding Sources

PROJECT NAME	ANTICIPATED PROJECT START YEAR (FY)	TOTAL ESCALATED PROJECT COSTS (INCL. COST FROM PRIOR YEARS)	FUNDING SOURCES							
			FAA	FDOT	PFCs	AIRPORT FUNDS	BONDS (EXISTING DEBT)	BONDS (NEW DEBT)	TENANT OR 3RD PARTY	
MPU LAYER 5										
Terminal Expansion Phase 1 (T4 FIS)	2032	\$339,300,000	\$-	\$6,786,000	\$-	\$-	\$-	\$-	\$332,514,000	\$-
SUBTOTAL MPU LAYER 5		\$339,300,000	\$-	\$6,786,000	\$-	\$-	\$-	\$-	\$332,514,000	\$-
MPU LAYER 6										
Taxilane (ADG III) Serving Westside Parcels	2021	\$16,100,000	\$-	\$6,000,000	\$6,000,000	\$-	\$-	\$-	\$4,100,000	\$-
Airfield Electrical Vault	2024	\$6,000,000	\$-	\$-	\$-	\$-	\$-	\$-	\$6,000,000	\$-
Gate 100 Relocation and Expansion	2024	\$12,000,000	\$-	\$-	\$-	\$-	\$-	\$-	\$12,000,000	\$-
Fuel Farm Expansion (Short-Term) & Oil/Water Separator	2025	\$73,900,000	\$-	\$-	\$-	\$-	\$-	\$-	\$7,390,000	\$66,510,000
Centralized Receiving and Distribution Facility	2023	\$20,900,000	\$-	\$-	\$-	\$-	\$-	\$-	\$20,900,000	\$-
SUBTOTAL MPU LAYER 6		\$128,900,000	\$-	\$6,000,000	\$6,000,000	\$-	\$-	\$-	\$50,390,000	\$66,510,000
MPU LAYER 7										
Belly Cargo Facility Expansion	2025	\$16,000,000	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$16,000,000
Airport Maintenance Expansion ALLOWANCE	2027	\$33,600,000	\$-	\$-	\$-	\$-	\$-	\$-	\$33,600,000	\$-
Aircraft Rescue and Firefighting (ARFF)	2029	\$40,000,000	\$-	\$-	\$-	\$-	\$-	\$-	\$40,000,000	\$-
Enabling In-Kind Hangar Replacement (Taxiway H)	2029	\$12,000,000	\$-	\$-	\$-	\$-	\$-	\$-	\$12,000,000	\$-
Consolidated BCAD Operations Facility	2021	\$12,200,000	\$-	\$-	\$-	\$-	\$-	\$-	\$12,200,000	\$-
General Aviation Customs Relocation (Includes Airside Ramp)	2030	\$17,600,000	\$-	\$8,800,000	\$-	\$8,800,000	\$-	\$-	\$-	\$-
Taxiway H Extension	2030	\$8,700,000	\$6,525,000	\$-	\$-	\$-	\$-	\$-	\$2,175,000	\$-
Crossfield Taxiway	2030	\$26,000,000	\$19,500,000	\$-	\$-	\$-	\$-	\$-	\$6,500,000	\$-
SUBTOTAL MPU LAYER 7		\$166,100,000	\$26,025,000	\$8,800,000	\$-	\$8,800,000	\$-	\$-	\$106,475,000	\$16,000,000
TOTAL		\$5,090,893,015	\$248,127,000	\$199,778,313	\$197,204,500	\$67,438,510	\$575,125,000	\$3,608,909,692	\$194,310,000	

NOTES:

Amounts shown are escalated dollars.

For fiscal years ending September 30.

1/ Includes AIP entitlements and discretionary.

2/ 5-Gate Terminal includes Hardstand Parking and South AOA Gate (504). Since the completion of the MPU Financial Analysis, the airlines and BCAD have agreed to construct a 5-gate Terminal 5 (with passenger and baggage processing, as well as landside access) with a \$250 million budget allowance.

SOURCES: Broward County Aviation Department, FY2019 – FY2024 ACIP Projects; Ricondo & Associates, Inc., April 2019, Master Plan Phase 1 Projects.

PREPARED BY: Ricondo & Associates, Inc., July 2019.

The FAA distributes grants under the 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 entitlement 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.

AIP grant eligibility is assumed to be 75 percent for eligible projects (or 80 percent for noise program implementation), at large-hub airports, such as FLL. Entitlement grants available to the Airport in any given year are established by a formula set forth in the FAA AIP Handbook. Entitlement grants for the Airport are projected based on the following AIP formula using the accelerated enplaned passenger forecast developed for the financial analysis of this MPU:

- \$15.60 for each of the first 50,000 enplaned passengers
- \$10.40 for each of the next 50,000 enplaned passengers
- \$5.20 for each of the next 400,000 enplaned passengers
- \$1.30 for each of the next 500,000 enplaned passengers
- \$1.00 for each enplaned passenger beyond 1.0 million enplaned passengers

For a given fiscal year, the entitlement formula is based on the numbers of enplaned passengers from the prior calendar year. For example, when calculating entitlement grants for FY 2020, the formula applies to numbers of enplaned passengers in CY 2018. Calculated entitlement grants were reduced by 75 percent due to \$4.50 PFC being collected at the Airport. **Table 8.4-3** presents the annual AIP entitlement grants available to fund the ACIP and MPU Phase I projects at the Airport through FY 2034.

As shown in Table 8.4-2, approximately \$90.1 million of AIP entitlement grants are projected to be available for funding eligible ACIP and MPU Phase I projects between FY 2020 and FY 2034.

Discretionary grants (annual and multiyear commitments through an FAA Letter of Intent [LOI]) are distributed by each FAA region based on availability and project priorities. Discretionary grants are generally made immediately available to fund project costs, while LOI grants are distributed to an airport sponsor over several years at defined annual funding levels. BCAD has received an average of \$34.8 million annually in discretionary funding over the past five years to fund eligible projects at the Airport².

Based on project eligibility, Table 8.4-2 shows the estimated uses of these projected available AIP entitlement and discretionary grants for the ACIP and MPU Phase I projects, which is approximately \$248.1 million through FY 2034.

² Federal Aviation Administration, Airport Improvement Program (AIP) Grant Histories FY 2014–2018, https://www.faa.gov/airports/aip/grant_histories/ (assessed May 10, 2019).

Table 8.4-3: Projected Airport Improvement Program Entitlement Grants

Based on the Series 2019 Airport System Revenue Bonds, for FY2020 enplaned passengers is estimated to be 19.2M.

FISCAL YEAR	FORECAST ENPLANED PASSENGERS		AIP ENTITLEMENT GRANTS	
	CALENDAR YEAR	ENPLANED PASSENGERS	TOTAL CALCULATED ^{1/}	ADJUSTED ^{2/}
2020	2018	17,349,000	\$20,379,000	\$5,095,000
2021	2019	17,858,000	\$20,888,000	\$5,222,000
2022	2020	18,372,000	\$21,402,000	\$5,351,000
2023	2021	18,888,600	\$21,919,000	\$5,480,000
2024	2022	19,405,200	\$22,435,000	\$5,609,000
2025	2023	19,921,800	\$22,952,000	\$5,738,000
2026	2024	20,438,400	\$23,468,000	\$5,867,000
2027	2025	20,955,000	\$23,985,000	\$5,996,000
2028	2026	21,488,800	\$24,519,000	\$6,130,000
2029	2027	22,022,600	\$25,053,000	\$6,263,000
2030	2028	22,556,400	\$25,586,000	\$6,397,000
2031	2029	23,090,200	\$26,120,000	\$6,530,000
2032	2030	23,624,000	\$26,654,000	\$6,664,000
2033	2031	24,138,800	\$27,169,000	\$6,792,000
2034	2032	24,653,600	\$27,684,000	\$6,921,000
TOTAL AIP ENTITLEMENT GRANTS (FY 2020 - FY 2034)				\$90,055,000

NOTES:

1/ Total AIP entitlement grants calculated using the methodology set forth in Federal Aviation Administration Order 5100.38D, *Airport Improvement Program Handbook*, September 30, 2014.

2/ Calculated entitlement grants reduced by 75 percent due to \$4.50 passenger facility charge being collected at the Airport.

SOURCES: FAA ACAIS Commercial Service Airports; Ricondo & Associates, Inc., July 2019.

PREPARED BY: Ricondo & Associates, Inc., July 2019.

8.4.2.2 State Grants

Some states have programs to assist in airport capital development. 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 50 percent of the sponsor's matching share when federal funding is available and up to 50 percent of the overall project cost when it is not.

In addition to the Florida Aviation Grant Program, the Strategic Intermodal System (SIS) provides another funding mechanism for State participation in capital projects development. SIS was established to enhance Florida's mobility and economic competitiveness by investing in the development of intermodal systems throughout the state. The SIS is made up of facilities and services of statewide and interregional significance to form the strategic intermodal system.

The Airport has historically received funds from FDOT at various levels. As shown in Table 8.4-2, approximately \$200.0 million of FDOT Grants are assumed to be available to fund eligible ACIP and MPU Phase I projects.

8.4.2.3 Passenger Facility Charges

Since 1991, the collection of a PFC at the nation's airports has been authorized under Title 14 of the Code of Federal Regulations, Part 158, and the PFC Program has been administered by the FAA. PFCs are collected from eligible passengers to fund eligible airport projects. Since April 1, 2001, a PFC of up to \$4.50 per eligible enplaned passenger can be imposed by a U.S. airport operator. In 1994, BCAD received its first approval from the FAA to impose and use a \$3.00 PFC (less \$0.11 airline collection fee) at the Airport. Currently, BCAD collects a \$4.50 PFC (less \$0.11 airline collection fee) from eligible enplaned passengers at the Airport and the charge expiration date for the authority is set to expire on February 1, 2032.

PFC revenues may be used on a pay-as-you-go (PAYGO) basis or leveraged to pay debt service on bonds or other debt with a pledge of PFC revenue for repayment. Because airport sponsors may use PFC revenues for the local matching share of AIP or FDOT grants, PFCs can help sponsors implement AIP-funded or FDOT-funded projects sooner than they will be able to do otherwise. Although the FAA is required to approve the collection of a PFC and the use of PFC revenues, the PFC Program permits local collection of PFC revenues through the airlines operating at airports, and it provides more flexibility to airport sponsors than AIP funding. PFCs may be used for any AIP-eligible project; although, PFC eligibility is generally broader than AIP eligibility. PFC revenue can be used to preserve or enhance safety, security, or capacity of the national air transportation system; reduce noise or mitigate noise impacts resulting from an airport; or furnish opportunities for enhanced competition between or among air carriers.

The FAA has approved PFC applications (and subsequent amendments) for the Airport, with a combined authority for BCAD to impose and use approximately \$1.9 billion of PFC revenues to fund completed and future improvements at the Airport. As of September 30, 2019, BCAD has yet to collect approximately \$1.1 billion of this PFC authority. For purposes of this financial analysis, it is assumed that BCAD will continue to apply for, collect, and use PFCs at a level of \$4.50 per qualified enplaned passenger throughout the Planning Period. As shown in Table 8.4-2, approximately \$197.2 million of PFC revenues are assumed to fund eligible ACIP and MPU Phase I projects.

8.4.2.4 Airport Funds

Revenues remaining after the payment of O&M 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. As shown in Table 8.4-2, ACIP and MPU Phase I project costs totaling approximately \$67.4 million are assumed to be funded with Airport funds through the Planning Period. These funds are primarily to be used to pay remaining costs of projects after maximizing the use of AIP grants, state grants, and PFC revenues.

8.4.2.5 Revenue Bond Proceeds

For purposes of this financial analysis and funding plan, proceeds from the issuance of General Airport Revenue Bonds (GARBs) are assumed to fund certain projects included in the ACIP and Phase I CIP. As shown in Table 8.4-2, approximately \$575.1 million of ACIP and MPU Phase I project costs have been funded with previously issued GARBs and approximately \$3.6 billion of ACIP and MPU Phase I project costs are assumed to be funded with future GARBs.

Table 8.4-4 presents the projections of existing debt service for GARBs and PFC bonds and future debt service for GARBs through FY 2034.

The County currently has debt service payable on GARBs issued in 2001, 2009, 2012, 2013, 2015, and 2017. As shown in Table 8.4-4, total annual debt service for these GARBs is approximately \$113.7 million in FY 2020 and is projected to decrease to approximately \$70.0 million in FY 2034. In addition, the County has debt service payable on PFC bonds issued in 2012, 2013, and 2015. Total annual debt service for these PFC bonds totals approximately \$58.0 million in FY 2020, which is funded using PFC revenues, and is projected to decrease to approximately \$46.2 million in FY 2034.

Future GARB debt service associated with the ACIP and Phase I CIP projects is assumed to be issued annually for each of the project layers containing annual project costs. Annual debt service for each series of GARBs is calculated based on an assumed interest rate of 6.0 percent, no capitalized interest, and a bond term of 30 years. As shown in Table 8.4-4, the resulting annual debt service for future GARBs is approximately \$42.3 million beginning in FY 2020 and is projected to increase to approximately \$294.8 million in FY 2034.

8.4.2.6 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, revenue-generating 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.

As shown in Table 8.4-2, ACIP and the MPU Phase I project costs totaling approximately \$194.3 million are assumed to be funded by a tenant or third-party. The following projects are assumed to be partially or fully funded by a tenant or third-party:

- Bus Lot Staging and Maintenance (approximately \$6.0 million)
- Commercial Center (Phase 1) (approximately \$105.8 million)
- Fuel Farm Expansion and Oil/Water Separator (approximately \$66.5 million of this approximately \$73.9 million project).
- Belly Cargo Facility Expansion (approximately \$16.0 million project)

8.4.3 OPERATING AND MAINTENANCE EXPENSES

O&M Expenses at the Airport are budgeted by department. Expenses are designated as one of the following types: personnel, contractual services, police and fire fighting services, utilities, insurance, repairs and maintenance, North Perry Airport, and administrative. As previously described in Section 8.4.1, O&M Expenses are allocated to the Airfield and Terminal Cost Centers for rate-setting purposes.



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Table 8.4-4: Projected Debt Service

Updated projected debt service numbers can be found in the Series 2019 Airport System Revenue Bonds.

FISCAL YEAR:	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Existing Debt Service - GARBs															
2001 Series J-2	15,781,675	15,783,784	-	-	-	-	-	-	-	-	-	-	-	-	-
2009 Series O	7,327,276	7,324,276	7,328,025	7,327,773	7,328,275	7,329,025	7,328,438	16,295,488	18,382,500	18,382,669	-	-	-	-	-
2012 Series P-1	14,377,750	14,369,250	30,157,250	30,161,000	21,824,250	21,826,000	35,427,000	-	-	-	-	-	-	-	-
2012 Series P-2	7,629,530	6,841,315	6,826,132	6,781,595	1,433,998	2,359,438	2,359,438	-	-	-	-	-	-	-	-
2012 Series Q-2	6,983,750	6,980,000	6,980,750	6,980,500	6,984,000	6,980,750	6,980,750	6,983,500	6,983,500	6,980,500	6,984,250	6,984,000	6,979,500	6,980,500	6,981,250
2013 Series A	10,990,650	10,987,150	10,990,650	10,990,400	10,991,150	10,987,463	10,988,013	10,987,013	10,988,938	10,988,000	10,988,675	10,990,175	10,991,713	10,987,500	10,987,013
2013 Series B	3,637,013	3,637,013	3,638,513	3,636,613	3,638,363	3,636,863	3,637,113	3,638,863	3,636,863	3,636,113	3,637,125	3,638,413	3,640,013	3,635,838	3,635,888
2015 Series A-B	29,056,035	29,053,785	29,056,035	29,051,535	29,049,535	29,048,785	29,053,035	29,055,785	29,050,785	29,052,035	29,052,785	29,051,535	29,051,785	29,051,785	29,049,785
2017 Series A-B	17,960,750	19,346,250	19,347,250	19,350,250	19,349,500	19,349,500	19,349,500	19,353,750	19,346,250	19,351,750	19,348,750	19,346,750	19,349,750	19,346,500	19,351,250
Subtotal Existing Debt Service - GARBs	\$113,744,428	\$114,322,823	\$114,324,605	\$114,279,666	\$100,599,071	\$101,517,823	\$115,123,286	\$86,314,398	\$88,388,835	\$88,391,066	\$70,011,585	\$70,010,873	\$70,012,760	\$70,002,123	\$70,005,185
Future Debt Service - GARBs															
Future Baseline (ACIP)	39,225,747	41,883,005	42,392,012	42,392,012	42,392,012	42,392,012	42,392,012	42,392,012	42,392,012	42,392,012	42,392,012	42,392,012	42,392,012	42,392,012	42,392,012
Future MPU Layer 1	1,113,866	2,624,936	3,771,825	5,031,907	5,031,907	5,031,907	5,031,907	5,031,907	5,031,907	5,031,907	5,031,907	5,031,907	5,031,907	5,031,907	5,031,907
Future MPU Layer 2	1,952,689	13,965,809	26,234,658	34,282,349	41,341,441	49,470,836	57,600,230	57,600,230	57,600,230	57,600,230	57,600,230	57,600,230	57,600,230	57,600,230	57,600,230
Future MPU Layer 3	-	-	4,134,144	10,784,724	23,121,794	33,694,092	33,694,092	33,694,092	33,694,092	33,694,092	33,694,092	33,694,092	33,694,092	33,694,092	33,694,092
Future MPU Layer 4	-	367,661	1,356,261	4,150,485	9,877,827	28,332,123	47,871,755	72,895,583	100,401,694	116,155,071	116,155,071	116,155,071	116,155,071	116,155,071	116,155,071
Future MPU Layer 5	-	-	-	-	-	-	-	-	-	-	-	-	8,743,470	17,799,206	27,167,210
Future MPU Layer 6	-	40,851	334,980	514,725	2,101,387	3,577,750	4,116,987	4,116,987	4,116,987	4,116,987	4,116,987	4,116,987	4,116,987	4,116,987	4,116,987
Future MPU Layer 7	-	106,213	996,770	996,770	996,770	996,770	996,770	1,282,729	2,491,925	4,183,166	8,066,075	8,699,269	8,699,269	8,699,269	8,699,269
Subtotal Future Debt Service - GARBs	\$42,292,302	\$58,988,475	\$79,220,650	\$98,152,972	\$124,863,138	\$163,495,490	\$191,703,752	\$217,013,538	\$245,728,846	\$263,173,463	\$267,056,372	\$267,689,566	\$276,433,036	\$285,488,773	\$294,856,776
Subtotal Debt Service - GARBs	\$156,036,730	\$173,311,298	\$193,545,254	\$212,432,638	\$225,462,209	\$265,013,313	\$306,827,038	\$303,327,936	\$334,117,681	\$351,564,530	\$337,067,957	\$337,700,439	\$346,445,796	\$355,490,895	\$364,861,961
Existing Debt Service - PFC Bonds															
2012 Series P-2	5,561,220	4,986,685	4,975,618	4,943,155	1,045,252	1,719,812	1,719,812	-	-	-	-	-	-	-	-
2012 Series Q-1	32,073,200	32,070,200	32,070,200	32,071,800	32,072,550	32,070,800	32,070,050	32,073,550	32,069,300	32,070,800	32,069,800	32,071,000	32,073,200	32,070,200	32,071,000
2013 Series C	14,089,888	14,092,638	14,094,888	14,091,138	14,091,138	14,091,538	14,093,025	14,094,813	14,091,113	14,091,400	14,089,625	14,090,000	14,093,450	14,089,900	14,093,525
2015 Series C (L Refunding)	6,245,250	6,246,750	6,251,250	6,243,000	6,242,000	3,302,250	-	-	-	-	-	-	-	-	-
Subtotal Debt Service - PFC Bonds	\$57,969,558	\$57,396,272	\$57,391,955	\$57,349,092	\$53,450,939	\$51,184,399	\$47,882,887	\$46,168,363	\$46,160,413	\$46,162,200	\$46,159,425	\$46,161,000	\$46,166,650	\$46,160,100	\$46,164,525
Total Debt Service	\$214,006,288	\$230,707,570	\$250,937,210	\$269,781,730	\$278,913,148	\$316,197,712	\$354,709,925	\$349,496,299	\$380,278,093	\$397,726,730	\$383,227,382	\$383,861,439	\$392,612,446	\$401,650,995	\$411,026,486

SOURCES: Broward County Aviation Department; Ricondo & Associates, Inc., April 2019.
 PREPARED BY: Ricondo & Associates, Inc., July 2019.



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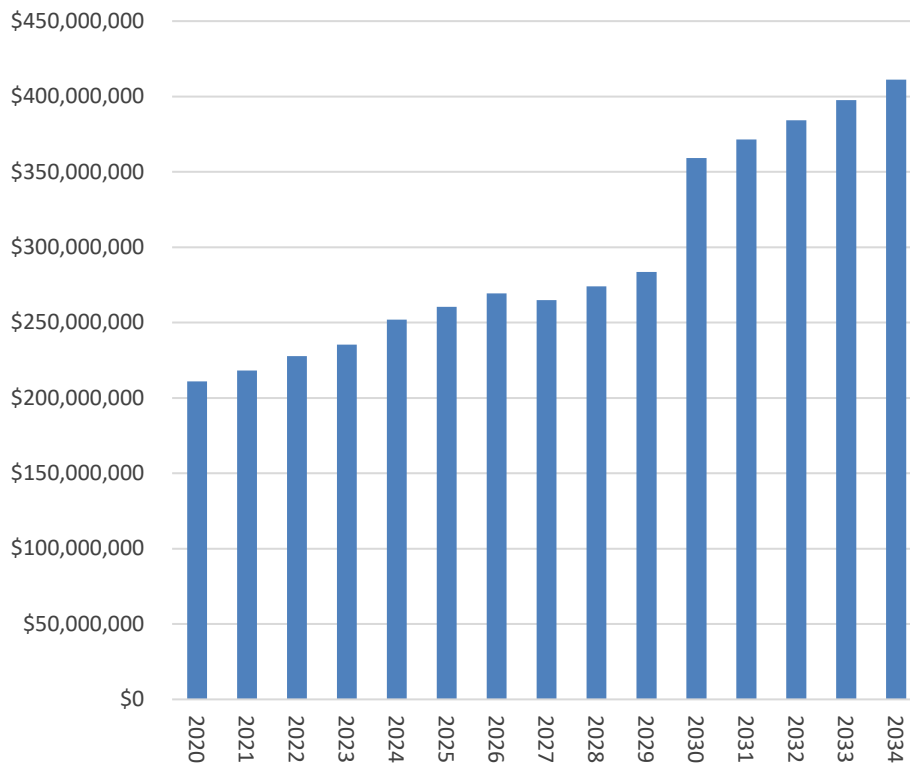


Projections of future O&M Expenses are developed based on a review of historical/budget data, the effects of inflation, and the forecast growth in numbers of aircraft operations and enplaned passengers at the Airport. In addition, it is expected that, as certain ACIP and MPU Phase I projects are completed, associated O&M Expenses could change accordingly. Construction of new facilities may increase future O&M Expenses, while reconstructed pavement (for example) may require less maintenance, thereby reducing future O&M Expenses. For purposes of this financial analysis, the anticipated implementation of certain ACIP and MPU Phase I projects are assumed to have an impact on future O&M Expenses. As a result, total O&M Expenses are projected to increase by an additional \$341.2 million throughout the Planning Period, which consists of an increase of approximately \$110.5 million for the 5-Gate Terminal, a decrease of approximately \$121.4 million for the APM Circulator, and an increase of approximately \$352.1 million for the Terminal Expansion – Phase I projects.

Exhibit 8.4-1 presents projections of O&M Expenses for the Planning Period. As shown, total O&M Expenses are projected to increase from approximately \$211.0 million in FY 2020 to approximately \$411.2 million in FY 2034, reflecting a compound annual growth rate of 4.9 percent during that period.

Exhibit 8.4-1: Projected Operation and Maintenance Expenses

Based on the Series 2019 Airport System Revenue Bonds, the FY2020 projected operation and maintenance expenses are estimated to be \$228.5M.



NOTE:

For fiscal years ending September 30.

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

PREPARED BY: Ricondo & Associates, Inc., July 2019.

8.4.4 AIRPORT REVENUES – NON-AIRLINE AND AIRLINE

8.4.4.1 Non-Airline Revenues

Non-Airline Revenues include revenues generated for the Airport other than revenues generated from the Airline Agreement. Non-Airline Revenues include elements such as: concessions revenues, including terminal concessions, car rental concessions, and parking; fuel farm and fuel flowage fees; non-airline space rentals, including building and hangar rentals and commercial and industrial rentals; revenues generated at North Perry Airport; Customer Facility Charges (CFCs); interest income; and other reimbursements. However, as specified in the rate-setting methodologies defined in the Airline Agreement, Non-Airline revenues affect airline rates and, therefore, Airline Revenues.

Projections of future Non-Airline Revenues are developed based on a review of historical/budget data, the effects of inflation, the forecast growth in numbers of aircraft operations and enplaned passengers at the Airport, and the anticipated increases in revenue from the implementation of certain ACIP and MPU Phase I projects. For purposes of this financial analysis, the anticipated implementation of certain ACIP and MPU Phase I projects are assumed to have an impact on future Non-Airline revenues. These projects include the Airport Hotel and the Commercial Center (Phase 1). As a result of these projects, total Non-Airline Revenues are projected to increase by an additional \$97.0 million throughout the Planning Period, which consists of increases of approximately \$81.3 million for the Airport Hotel and approximately \$15.7 million for the Commercial Center projects.

Exhibit 8.4-2 presents projections of Non-Airline Revenues for the Planning Period. As shown, total Non-Airline Revenues are projected to increase from approximately \$186.1 million in FY 2020 to approximately \$320.0 million in FY 2034, reflecting a compound annual growth rate of 3.9 percent during that period.

8.4.4.2 Airline Revenues

The remaining Revenues generated at the Airport under the current Airline Agreement include landing fees and terminal rentals, which are payable by the Airlines operating at the Airport. As previously described in Section 8.4.1, rates are calculated for both the Airfield and Terminal Cost Centers. The resulting revenues are collectively known as Airline Revenues. The financial projections included in this section are in accordance with the terms and conditions set forth in the Airline Agreement and assume a continuation of the rate-setting methodology set forth in the current Airline Agreement through the Planning Period.

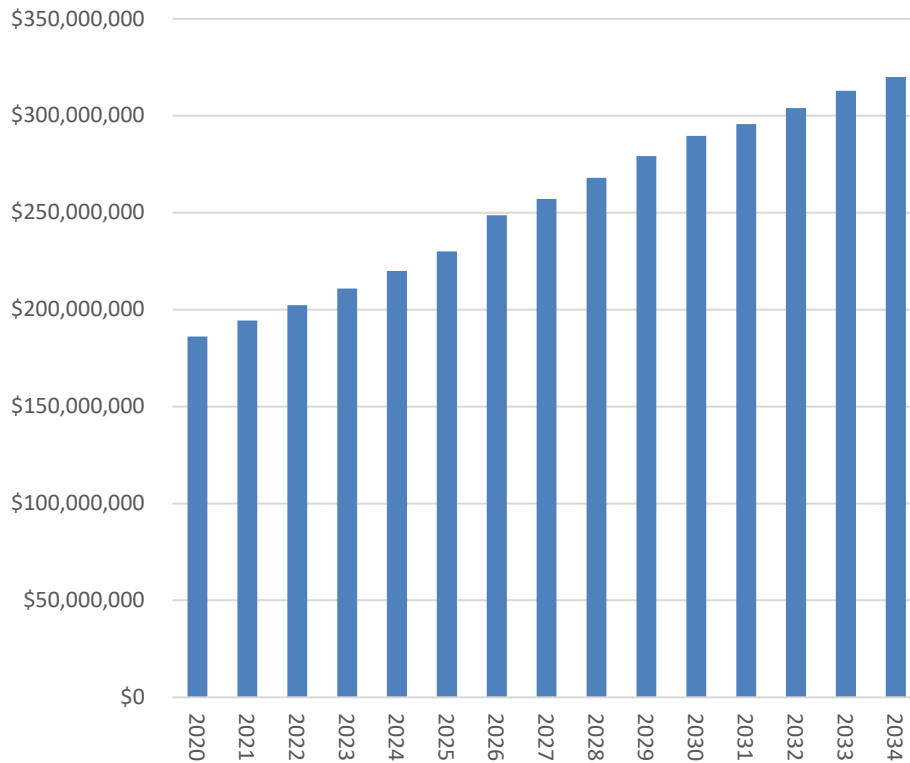
The items included in the total requirement for the landing fee and terminal rental rate are as follows:

- O&M Expenses. Includes the O&M expenses (direct and allocated indirect) attributable to the specific rate-setting area.
- O&M Reserve Requirement. Includes amounts needed to maintain the Trust Agreement's O&M reserve requirement within the specific rate-setting area.
- Debt Service. Includes the Signatory Airline portion of the annual debt service payment attributable to the specific rate-setting area.
- Debt Service Coverage Requirement. Includes amounts needed to maintain the Airport System Revenue (ASR) Bond Resolution's debt service coverage requirement of 1.25x within the specific rate-setting area.



Exhibit 8.4-2: Projected Non-Airline Revenues

Based on the Series 2019 Airport System Revenue Bonds, the FY2020 airline revenues is estimated to be \$200.4M.



NOTE:

For fiscal years ending September 30.

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

PREPARED BY: Ricondo & Associates, Inc., July 2019.

- **Renewal and Replacement Account Deposit.** Includes amounts to be included in Airline rates and charges to fund certain capital replacement projects within the specific rate-setting area.
- **Improvements Account.** Includes amounts to be included in Airline rates and charges to fund certain capital improvement projects within the specific rate-setting area.

The following sections present additional information with regards to each specific rate calculation.



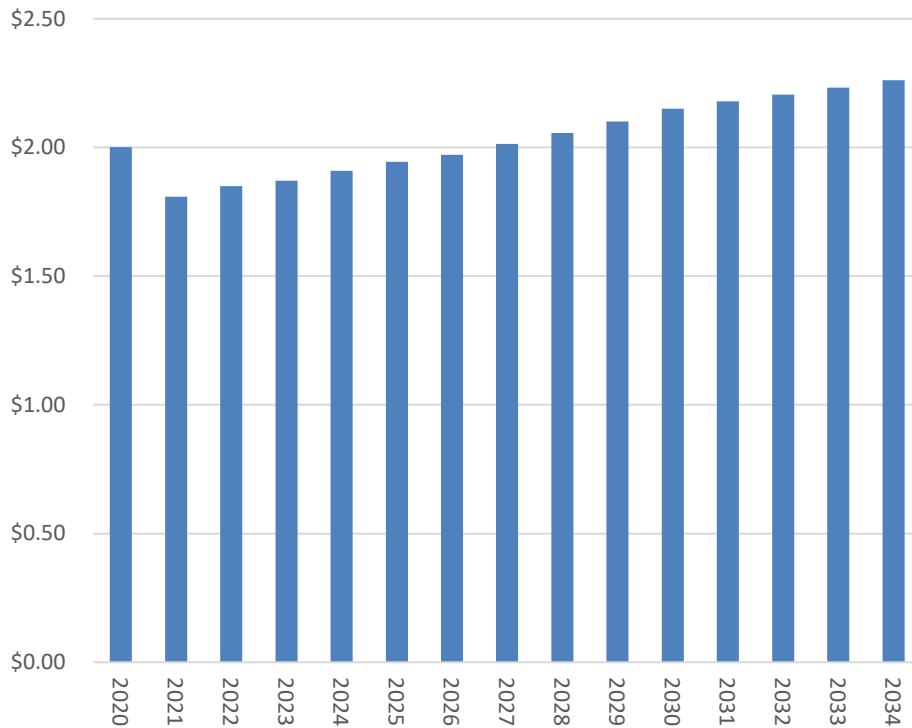
Airfield

The landing fee is calculated pursuant to the Airline Agreement by combining the previously described items above for the Airfield Cost Center to determine the total airfield requirement. The total airfield requirement is reduced by fuel flowage fees, fuel farm revenues, non-signatory airline landing fees, remote aircraft parking, interest income, and transfers from the General Purpose Account to calculate a net airfield requirement. The net airfield requirement is divided by the Signatory Airlines total landed weight to determine the signatory landing fee. Total landing fee revenues are equal to the sum of the signatory landing fee multiplied by the total signatory landed weight. The affiliate landing fee rate and non-signatory landing fee rate are designed as premiums based on the signatory landing fee rate. Under the current Airline Agreement, the affiliate landing fee rate is 120 percent of the calculated signatory landing fee rate, while the non-signatory landing fee rate is 130 percent of the calculated signatory landing fee rate.

Exhibit 8.4-3 presents the projected signatory landing fees at the Airport for the Planning Period. As shown, the signatory landing fee is projected to increase from \$2.00 per thousand pounds landed weight in FY 2020 to \$2.26 per thousand pounds of landed weight in FY 2034. This increase in the signatory landing fee between FY 2020 and FY 2034 reflects a compound annual growth rate of 0.9 percent.

Exhibit 8.4-3: Projected Signatory Landing Fees

Based on the Series 2019 Airport System Revenue Bonds, the FY2020 projected signatory landing fees is estimated to be \$1.71.



NOTES:

Landing fee per thousand pounds landed weight.

For fiscal years ending September 30.

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

PREPARED BY: Ricondo & Associates, Inc., July 2019.

Terminal

The total terminal requirement is reduced by non-airline concession revenues, joint use fees, FIS fees, per use fees, non-signatory rental revenues, other terminal operating revenues, and the transfer from the General Purpose Account to arrive at the net signatory airline terminal requirement. The net signatory airline terminal requirement is divided by the total Signatory Airline leased square footage to determine the signatory average terminal rental rate per square foot. Total signatory average terminal rental rate revenues are equal to the sum of the signatory terminal rental rate per square foot multiplied by the total Signatory Airline leased square footage.

The Airline Agreement defines premises leased by Signatory Airlines in the Terminal according to four types of space for the purpose of establishing differential rental rates by location and function of the Airport. The Signatory average terminal rental rate per square foot in each period is converted to differential terminal rental rates by weighting the amount of Type 1, 2, and 3 spaces of all Signatory Airlines by the relative rate value factors 1.00, 0.93, and 0.72, respectively, to obtain a weighted equivalent amount of space. Space types include but are not limited to the following areas: Type 1 includes ticket counters and airline ticket offices. Type 2 includes bag service, holdrooms, and bag claim. Type 3 includes curbside check-in and baggage makeup devices. The net terminal requirement is divided by the weighted equivalent space to determine the rate for the Type 1 premium space. Rates for Type 2 and Type 3 space are determined by multiplying the respective relative factors for the spaces by the Type 1 premium rate. The Airline Agreement establishes the terminal rental rate for non-signatory airlines and non-airline tenant leasing space in the passenger terminals at the Airport each year; such rates and charges are no less than 130 percent of the applicable signatory average terminal rental rate per square foot.

As depicted on **Exhibit 8.4-4**, the signatory average terminal rental rate is projected to increase from a rate of \$214.61 per square foot in FY 2020 to \$425.48 per square foot in FY 2034 (see note on exhibit 8.4-4). This increase in the signatory average terminal rental rate between FY 2020 and FY 2034 reflects a compound annual growth rate of 5.0 percent.

8.4.5 COST PER ENPLANED PASSENGER

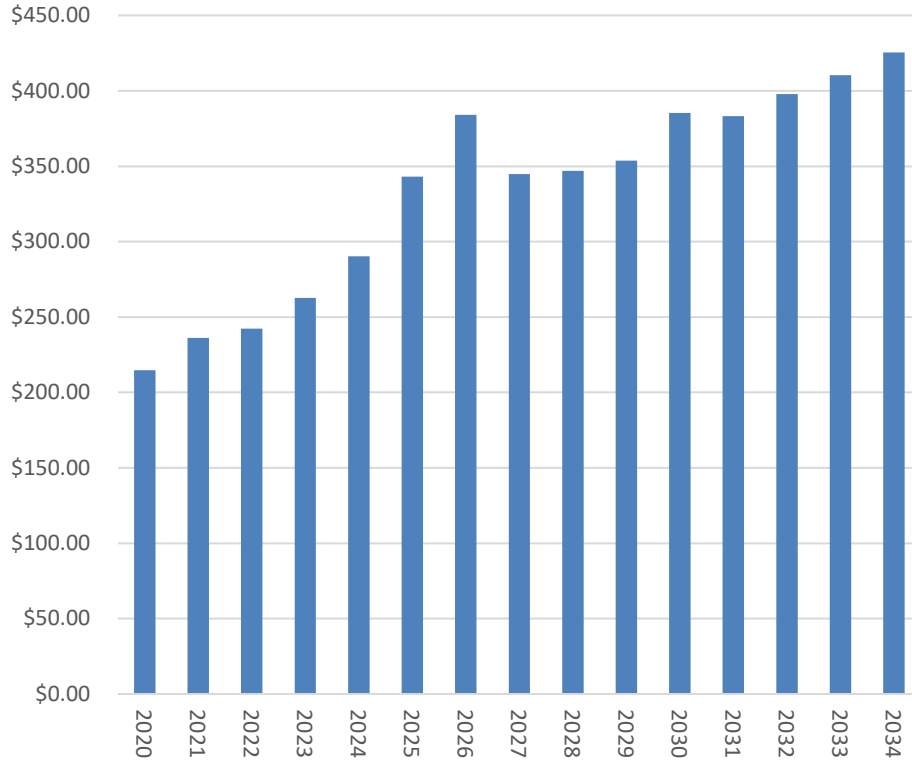
A general test of reasonableness of airport user fees is to assess the airline costs in a manner that accounts for airline activity. One approach is to measure airport user fees on a cost per enplaned passenger basis. By comparing this metric on a year-over-year basis and by comparing it to airline revenue and estimated costs allocated to the Airport, the reasonableness of Airport user fees can be determined.

Exhibit 8.4-5 presents the projected overall Airline CPE calculated from the Airline revenues (Airline terminal building rents, Airline landing fees, Airline remote parking revenues, Airline terminal joint use fees, and Airline FIS and per use fees) for the Planning Period. As depicted, the overall Airline CPE in current dollars (inflated) is projected to increase from \$10.56 in FY 2020 to \$19.71 in FY 2034. This increase in the overall Airline CPE between FY 2020 and FY 2034 reflects a compound annual growth rate of 4.6 percent. As also shown on Exhibit 8.4-5, the overall Airline CPE in 2018 dollars is projected to increase from \$10.04 in FY 2020 to \$13.14 in FY 2034.



Exhibit 8.4-4: Projected Signatory Average Terminal Rental Rates

Based on the Series 2019 Airport System Revenue Bonds, the FY2020 projected signatory average terminal rental rate is estimated to be \$173.89 per square foot.



NOTES:

Terminal Rental Rate per square foot.

For fiscal years ending September 30.

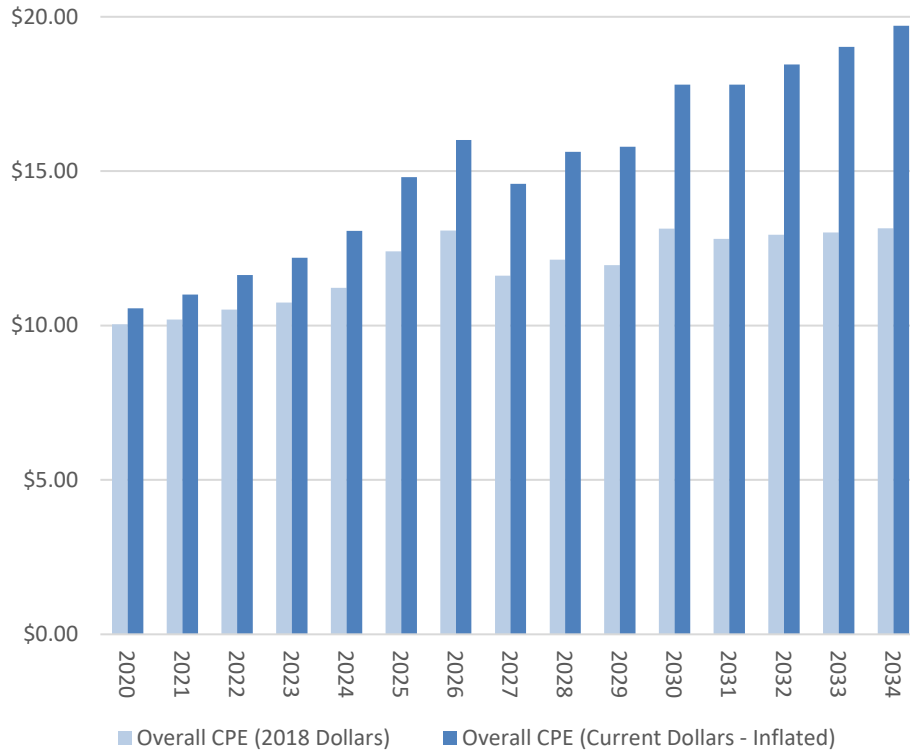
SOURCES: Broward County Aviation Department; Ricondo & Associates, Inc., April 2019.

PREPARED BY: Ricondo & Associates, Inc., July 2019.



Exhibit 8.4-5: Projected Cost Per Enplaned Passenger

Based on the Series 2019 Airport System Revenue Bonds, the FY2020 CPE is estimated to be \$7.92.



NOTE:

For fiscal years ending September 30.

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

PREPARED BY: Ricondo & Associates, Inc., July 2019.

The projected overall Airline CPE are evaluated for reasonableness based on the expectation that these fees will not deter forecasted demand for air traffic at the Airport as Airlines continue to deploy capacity to airports based on available resources. The increase in the overall Airline CPE during the Planning Period, as shown on Exhibit 8.4-5, is primarily related to the financing (GARBs) and operation of ACIP and Phase I CIP projects. As previously shown in Table 8.4-2, these projects will be funded with future GARB debt service and include terminal expansion projects necessary to meet air carrier demand.

8.4.6 DEBT SERVICE COVERAGE

As contained in the Airport System Revenue (ASR) Bond Resolution:

“Broward County further agrees that it will fix, charge and collect rates, fees, rentals and charges in connection with the ownership and operation of the Airport System and for services rendered in connection therewith and shall revise such rates, fees, rentals and charges as often as may be necessary or appropriate, so that for each Fiscal Year the

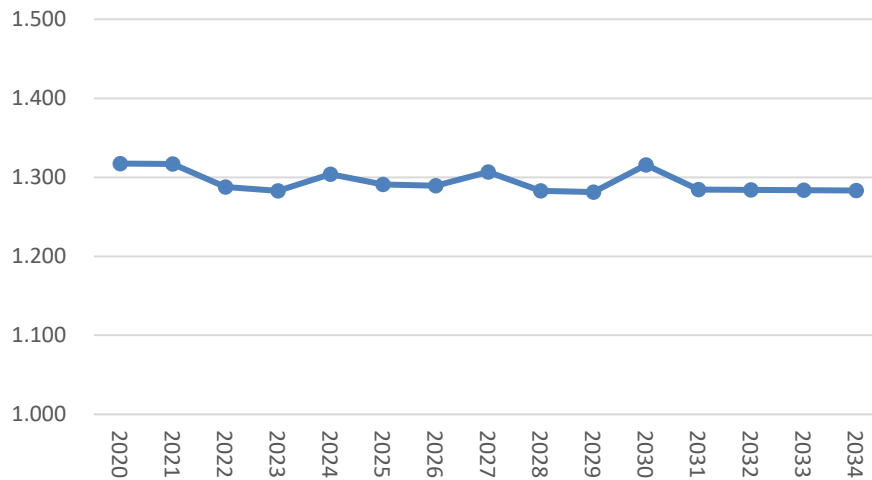


Net Revenues plus any Transfer for such Fiscal Year will be equal to at least 125% of Principal and Interest Requirements on all Outstanding Bonds for such Fiscal Year.”

Included in the Net Revenue and debt service coverage calculation are Airline Revenues, Non-Airline Revenues, interest income, transfers from the General Purposes Account, less O&M Expenses, fund deposit requirements, debt service and transfer from PFC Capital Improvements Fund. **Exhibit 8.4-6** presents the projected debt service coverage pursuant to the ASR Bond Resolution during the Planning Period. The debt service coverage ratio is projected to exceed the ASR Bond Resolution minimum requirement of 1.25x in each year of the Planning Period.

Exhibit 8.4-6: Projected Debt Service Coverage

Based on the Series 2019 Airport System Revenue Bonds, the FY2020 debt service coverage is estimated to be 1.42.



NOTE:

For fiscal years ending September 30.

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

PREPARED BY: Ricondo & Associates, Inc., July 2019.

8.4.7 FINANCIAL ANALYSIS CONCLUSION

The financial analysis presented in this section is conducted to show a possible funding plan for implementing the ACIP and MPU Phase I projects. Based on analyses of forecast activity at the Airport and projected Revenues and O&M Expenses, it appears that BCAD has resources to meet the funding requirements for implementing the ACIP and MPU Phase I projects although it does require a significant increase in airline revenue. BCAD has access to various sources of funding, which includes a mix of FAA funding, state funding, PFC revenues, Airport funds, revenue bond proceeds, and third-party funding. In accordance with the ASR Bond Resolution, the debt service coverage ratio is projected to be above the minimum requirement of 1.25x in each year through FY 2034.

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

- Enplaned passenger/traffic growth: As applicable, the funding plan is developed and analyzed based on the aviation activity forecasts developed for the Airport (see Section 3). Actual year-to-year numbers of enplaned passengers and aircraft operations will likely vary from the forecasts. Significant changes in numbers of enplaned passengers and aircraft operations may affect Revenues and O&M Expenses, as well as PFC revenues and AIP grants.
- Availability of additional AIP and FDOT funds: In developing the estimated funding plan for implementing the ACIP and Phase I CIP projects, it is assumed that the FAA and FDOT will continue to authorize and appropriate grants for eligible projects. Because the level of funds may vary from year to year, alternative funding sources may need to be identified if grants cannot be obtained for certain eligible projects. Conversely, BCAD should take full advantage of all available grants, including potential AIP and FDOT grants. Obtaining such grant funding may reduce the need for PFC revenues and/or Airport cash funding for certain projects, thereby allowing those funds to be used for other projects.
- Potential increase in maximum PFC level: Airport industry groups have requested that federal PFC regulations be amended to increase the maximum PFC level from the current \$4.50 per eligible enplaned passenger. Although the FAA reauthorization bill enacted in February 2012 nor the FAA reauthorization passed in Congress in 2018 did not address this issue, it is possible that future reauthorization legislation will address it. In developing the financial projections and the funding plan, it is assumed that the current \$4.50 PFC in effect at the Airport will remain in effect for the entire Planning Period. If federal PFC regulations are amended and the maximum PFC level is increased, then BCAD may choose to apply to the FAA for authorization to impose a higher PFC at the Airport, offsetting the airline requirement
- Monitoring project cost changes: Project cost changes should be evaluated and incorporated into future financial analysis, which could require changes in schedule or scope or advancement / deferment of projects.

The CIP projects are anticipated to be pursued as demand necessitates. For purposes of financial analysis, the implementation schedule reflects the need for these projects to accommodate the demand projected in the accelerated demand forecast. The financial impact of these projects, assuming the preliminary plan of finance described in this financial analysis, results in a growth of required Airline Revenue representing a compounded annual growth rate of approximately 4.6 percent from FY 2020 through FY 2034 when measured on a cost per enplaned passenger basis. Under the current Airline Agreement, airlines have voting rights for approval of projects. The implementation of the CIP will require airline stakeholder feedback and ultimately an approval/disapproval process in order to determine support for individual projects and reasonableness of the projected rate increases. The projects are anticipated to be pursued incrementally with an assessment of financial impact and feasibility on a project-by-project basis. Therefore, phased implementation scenarios were evaluated in order to assess the impact of implementing the CIP incrementally.

8.5 Alternative Scenario

This section presents an alternative scenario conducted to assess the financial impacts of changes to the proposed implementation sequencing of the CIP projects. The subsequent sections provide an overview of the alternative implementation sequencing associated with accelerating the terminal expansion and the resulting financial impact of the ACIP and MPU Phase I projects over the Planning Period. This alternative scenario is intended only to demonstrate financial impact. Actual funding strategies and financial feasibility for each project will be determined at the time of project implementation and could vary materially.

8.5.1 MPU PHASE 1 ALTERNATIVE IMPLEMENTATION SEQUENCING

The alternative scenario accelerates completion of the Terminal Expansion Phase 1 (T20), including the processor and gates by three years and the construction of a new FIS by nine years. BCAD could save approximately \$171.4 million in escalation costs by accelerating the construction of terminal development. **Table 8.5-1** presents the alternative preliminary implementation sequencing including a breakdown of the timing of each project by phase (PDD and environmental documentation, design, and construction), project triggers, and dependencies.

8.5.2 ALTERNATIVE FINANCIAL ANALYSIS

Table 8.5-2 illustrates the key financial results of the alternative scenario as compared to the baseline financial analysis presented in Section 8.4. This table presents the projected enplanements, overall Airline CPE, and debt service coverage ratios for the baseline and alternative scenario.

As shown in Table 8-5.2, enplanements for the baseline are projected to increase at a compound annual growth rate of 2.6 percent between FY 2020 and FY 2029 before being capped at 23.5 million annual enplanements (MAEP) in FY 2030 due to gate constraints. In FY 2030, it is assumed that 77 gates in total will be in use when FLL reaches its capacity. Enplanements for the alternative scenario are projected to be capped at 19.0 MAEP between FY 2021 and FY 2023 until the 5-Gate Terminal 5 project is assumed to be complete in FY 2023 (71 gates in total). Enplanements are then projected to increase in FY 2024 and FY 2025 before being capped at 21.0 MAEP in FY 2026. Enplanements for the alternative scenario will begin to increase again in FY 2027 when the Terminal Expansion Phase I project is assumed to be complete. This project will bring online an additional 6 gates (77 gates in total). Similar to the baseline, enplanements for the alternative scenario are being capped at 23.5 MAEP beginning in FY 2030 due to FLL reaching its capacity.

As also depicted in Table 8.5-2, the overall Airline CPE for the baseline is projected to increase from \$10.56 in FY 2020 to \$19.71 in FY 2034. The overall Airline CPE for the alternative scenario is projected to increase from \$10.56 in FY 2020 to \$18.94 in FY 2034. This increase in the overall Airline CPE for the alternative scenario between FY 2020 and FY 2034 reflects a compound annual growth rate of 4.3 percent, which is slightly lower than the compound annual growth rate of 4.6 percent for the baseline during this same period.

As also shown in Table 8.5-2, the debt service coverage ratios for both the baseline and alternative scenario are projected to exceed the ASR Bond Resolution minimum requirement of 1.25x in each year of the Planning Period.



Table 8.5-1 (1 of 2): Phase 1 Alternative Preliminary Implementation Schedule

Project ID	Project Name	Project Dependency	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	FY 2029	FY 2030	FY 2031	FY 2032	FY 2033	FY 2034	Total ROM Cost (Escalated)	Trigger	Notes
T5	5-Gate Terminal 5 ^{1/}	None		*															\$ 109,256,015	Passenger demand of 37 MAP (on or before 2020).	Current RON positions west of Terminal 4 will need to be relocated to accommodate new 5-Gate Terminal.
G12	Intermodal Center (Transit Center, 4,500 - space Garage) Phase 1 ^{2,3/}	None (Outlay of Airport funds may be restricted since parcel is not owned by BCAD)		*															\$ 189,800,000	Vehicular parking demand at 37 MAP requires an additional 1,580 parking spaces. Project will also accommodate parking loss from the demolition of the Palm Garage (Project G12).	Criticality of this project from a timing standpoint could be relaxed if Palm Garage replacement parking is accommodated elsewhere or via a separate project.
A5	Taxilane (ADG III) Serving Westside Parcels ^{4/}	None																	\$ 16,100,000	Tenant driven demand for development of westside parcels.	
G14	Supplemental Curb (Includes Demo of Palm Garage) ^{3/}	G12	*																\$ 42,500,000	Immediate improvements needed to address existing LOS on arrivals curb.	Requires completion of Intermodal Center Phase 1 (G12). Extended design period tied to funding request.
T7	Automated People Mover (APM) Circulator ^{3/}	G14																	\$ 526,000,000	Project triggered at BCAD discretion.	Projects G14 and P5 are required to facilitate construction and operation of APM Circulator.
P5	Palm Garage Redevelopment ^{3/}	G12/G14							*										\$ 222,600,000	Vehicular parking demand at 42 MAP (on or before 2025) requires an additional 1,220 parking spaces.	Projects G12 and G14 required to facilitate Palm Garage Redevelopment.
G16	Consolidated BCAD Operations Facility (Public Safety Building)	A4																	\$ 12,200,000	Project triggered at BCAD discretion once location becomes available.	Development will take place on a shared parcel with the relocated ARFF.
T12	Terminal 4 Expansion Dependencies and Code Compliance Improvements	T20																	\$ 91,300,000	Prior to terminal expansion phase 1, terminal 4 must be improved to comply with current county building codes.	
T20	Terminal Expansion Phase 1 (Concourse G west expansion)	ALP Approval/T12							*										\$ 745,000,000	Passenger demand of 42 MAP (on or before 2025)	Projects T12, T14 and T18 are required for the Terminal Expansion Phase 1.
T20	Terminal Expansion Phase 1 (Processing)	T12/T14/T20																	\$ 315,400,000	Project triggered at BCAD discretion. Terminal 3 and 4 processing LOS' should be monitored to maintain acceptable levels once passenger wait times or queues extend beyond optimal levels.	
T20	Terminal Expansion Phase 1 (T4 FIS)	T20																	\$ 248,900,000	Project triggered at BCAD discretion. Terminal 3 and 4 processing LOS' should be monitored to maintain acceptable levels once passenger wait times or queues extend beyond optimal levels terminal expansion projects. Requires the construction of lower levels (FIS on mezzanine levels).	
G21	Central Utility Plant (Central Chiller Plant)	P5/G12/G14																	\$ 148,100,000	Project triggered at BCAD discretion. If developed facility should be available prior to new facilities coming online to avoid new and/or expanded individual chiller plants.	
T18	Airfield Improvements associated with Terminal Development Phase 1 ^{5/}	None							*										\$ 122,200,000	Project required to accommodate terminal gate demand at 42 MAP (on or before 2025).	
G11	Commerical Center	P5/G14																	\$ 105,800,000	Project triggered at BCAD discretion once Palm Garage Redevelopment is complete and connectivity via APM becomes available.	Commercial Center and hotel could be standalone projects. However, facility interfacing with Palm Garage redevelopment is critical, may trigger earlier development.
G11	Airport Hotel	P5/G11/G14																	\$ 196,500,000	Project triggered at BCAD discretion once Palm Garage Redevelopment is complete and connectivity via APM becomes available.	Commercial Center and hotel could be standalone projects. However, facility interfacing with Palm Garage redevelopment is critical, may trigger earlier development.



Table 8.5-1 (2 of 2): Phase 1 Alternative Preliminary Implementation Schedule

Project ID	Project Name	Project Dependency	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	FY 2029	FY 2030	FY 2031	FY 2032	FY 2033	FY 2034	Total ROM Cost (Escalated)	Trigger	Notes
G22	Centralized Receiving and Distribution Facility	G16																	\$ 20,900,000	Project triggered at BCAD discretion upon relocation of existing BCAD security offices.	The building that currently houses BCAD security must be vacated prior to construction.
A4	Airfield Electrical Vault	None																	\$ 6,000,000	Enabling the construction of the Consolidated BCAD Operations Facility (Public Safety Building) and ARFF facility.	A new airfield electrical vault is needed to provide space for the construction of a new crossfield taxiway and ARFF facility.
S2	Gate 100 Relocation and Expansion	None																	\$ 12,000,000	Project triggered at BCAD discretion.	Preferred location has been identified as greenspace currently available in the Northeast quadrant. A new location would be necessary if this parcel becomes unavailable.
G17	Belly Cargo Facility Expansion	None																	\$ 16,000,000	Project triggered at BCAD discretion.	Belly cargo building expansion is to the east of the existing facility. Project cost should be covered by operators
M12	Fuel Farm Expansion (Short-Term) & Oil/Water Separator	None																	\$ 73,900,000	Current capacity is 4.6 million gallons, 9.8 million gallons required to meet future demand.	Long-term expansion would trigger the existing maintenance facilities to be relocated prior to construction if the triangular parcel is not rezoned to accommodate future tank needs.
G18	Airport Maintenance Expansion ALLOWANCE	None																	\$ 33,600,000	Project triggered at BCAD discretion. 70 parking spaces and 180,000 square feet of building needed on or before 2035.	Facility expansion on BCAD owned land west of I-95 could trigger earlier development.
T14	Utility Improvements (Consolidated Utility Duct Bank) Phase 1 - Terminal 4	T20																	\$ 30,000,000	Project triggered at BCAD discretion.	
G16	Aircraft Rescue and Firefighting (ARFF)	A4/A8																	\$ 40,000,000	Relocation triggered to enable Phase 2 Terminal Development.	Prior to Terminal Phase 2 development. After, relocation of airfield electrical vault.
A7	Enabling In-Kind Hangar Replacement (Taxiway H)	A4																	\$ 12,000,000	Relocate prior to Taxiway H extension to provide for taxiway and its associated safety areas.	Existing hangar to be replaced with two smaller hangars. The ultimate location for the new electrical vault and preliminary siting of replacement hangars should be done in concurrence.
A6	Taxiway H Extension	A7																	\$ 8,700,000	Extension needed in order to provide ATC with the ability to sequence aircraft departing on Runway 10R-28L.	
A8	Crossfield Taxiway	G20/A4																	\$ 26,000,000	Western expansion of terminal, aircraft gates, and RON positions to serve anticipated demand of 52 MAP (on or before 2035).	
G20	U.S. Customs and Border Protection Relocation (Includes Airside Ramp)	A5/A8																	\$ 17,600,000	Relocation should take place prior to displacement from relocated crossfield taxiway and its associated safety areas to provide adequate apron space to meet future anticipated demand.	

- Legend:
- Project Definition Document & Environmental Documentation
 - Project Delay Due to Inter-related Project Dependency or current phasing/financial plan
 - Design
 - Construction
 - * Approximate point in time when facility capacity is needed to accommodate demand

NOTES: **Architectural Services for Master Plan is not reflected in the above implementation schedule but remains in the ACIP plan. It was originally an ACIP project with a total funding request of \$35M beginning in FY18 and ending in FY27. The project was shifted to the MPU list of projects as a result of on-going coordination with BCAD. It will be renamed Professional Services for Master Plan in the FY2020 ACIP book.

- 1/ This project includes a 5-Gate terminal, the relocation of existing RON positions and Terminal 4 bus station. 5-Gate Terminal includes Hardstand Parking and South AOA Gate (504). Since the completion of the MPU Financial Analysis, the airlines and BCAD have agreed to construct a 5-gate Terminal 5 (with passenger and baggage processing, as well as landside access) with a \$250 million budget allowance
- 2/ A phased intermodal facility has been defined in the master plan as a means to incrementally add parking capacity without overbuilding garage capacity. It also allows BCAD to push unnecessary costs off until the capacity is required. The eastern half of the IMC (Phase 2) will be constructed as additional employee parking is required beyond 2030, or if other parking needs are identified before that time.
- 3/ Discussion with FDOT has occurred and the programming and environmental documentation for all of these projects will be funded with FY19 SIS funding for access roadway project
- 4/ Based on discussions with FDOT, the funds for the design and construction of this project have been identified from a previous project that is no longer needed (Taxiway M). It is assumed that this budget will be supplemented with bonds to meet the budget shortfall between these two projects (\$4.1M)
- 5/ The advanced planning (PDD) effort associated with this project should be included in the Terminal Expansion Phase 1 (Project T20) PDD given the project dependencies and overlap.

SOURCES: Broward County Aviation Department (BCAD) - Planning Division, February 2019; Ricondo & Associates, Inc., February 2019; ACAI Associates, Inc., August 2018 (cost estimates); Craven Thompson & Associates, Inc., August 2018 (cost estimates).
 PREPARED BY: Ricondo & Associates, Inc., September 2019.



Table 8.5-2: Alternative Scenario Comparison of Key Financial Results

Based on the Series 2019 Airport System Revenue Bonds, FY2020 baseline enplanements is estimated at 19.2M, FY2020 baseline CPE is estimated to be \$7.92, and FY2020 debt service coverage is estimated to be 1.42.

	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Enplanements															
Baseline	18,372,000	18,888,600	19,405,200	19,921,800	20,438,400	20,955,000	21,488,800	22,022,600	22,556,400	23,090,200	23,500,000	23,500,000	23,500,000	23,500,000	23,500,000
Alternative Scenario	18,372,000	19,000,000	19,000,000	19,000,000	19,665,000	20,955,000	21,000,000	21,735,000	22,495,725	23,283,075	23,500,000	23,500,000	23,500,000	23,500,000	23,500,000
Cost Per Enplanement															
Baseline	\$10.56	\$11.00	\$11.63	\$12.20	\$13.06	\$14.81	\$16.01	\$14.59	\$15.63	\$15.79	\$17.80	\$17.81	\$18.45	\$19.03	\$19.71
Alternative Scenario	\$10.56	\$10.89	\$12.74	\$15.01	\$17.20	\$18.71	\$20.02	\$20.08	\$19.15	\$18.60	\$17.81	\$18.25	\$18.45	\$18.65	\$18.94
Debt Service Coverage															
Baseline	1.32	1.32	1.29	1.28	1.30	1.29	1.29	1.31	1.28	1.28	1.32	1.28	1.28	1.28	1.28
Alternative Scenario	1.32	1.32	1.29	1.28	1.29	1.28	1.28	1.33	1.28	1.28	1.28	1.28	1.28	1.28	1.28

NOTE:

For fiscal years ending September 30.

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

PREPARED BY: Ricondo & Associates, Inc., July 2019.



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8.6 Supplemental Financial Analysis

A supplemental financial analysis was prepared for the AAAC as requested during the meeting held on April 10, 2019. As a result of the Airline's feedback, the baseline financial analysis presented in Section 8.4 of this report was revised to include the impacts of the multiple caps in enplanements over the Planning Period due to gate constraints.

Exhibit 8.6-1 presents the projected gate capacity at FLL. As shown, FLL has 64 gates in FY 2019 and two additional gates are assumed to be completed in FY 2020 for a total of 66 gates. Enplanements are projected to be capped at 19.0 MAEP between FY 2021 and FY 2023 in the supplemental financial analysis. As also shown on Exhibit 8.6-1, an additional 5 gates are assumed to be available in FY 2024 when the 5-Gate Terminal 5 project is completed, which would bring FLL's total gate count to 71 gates. As a result, the enplanements are projected to increase in FY 2024 and FY 2025 until they are capped again at 21.0 MAEP in FY 2026. FLL's gate capacity is assumed to remain at 71 gates through FY 2029 with the 21.0 MAEP cap in place. In FY 2030, the Terminal Expansion Phase I project is expected to be completed, which will create an additional 6 gates for a total of 77 gates. With these additional 6 gates, enplanements will continue to increase the supplemental financial analysis assumes that enplanements will continue to increase between FY 2030 and FY 2032 until they are capped again at 23.5 MAEP in FY 2033 when FLL reaches its capacity. As depicted on Exhibit 8.6-1, enplanements are projected to be capped at 23.5 MAEP throughout the remainder of the Planning Period.

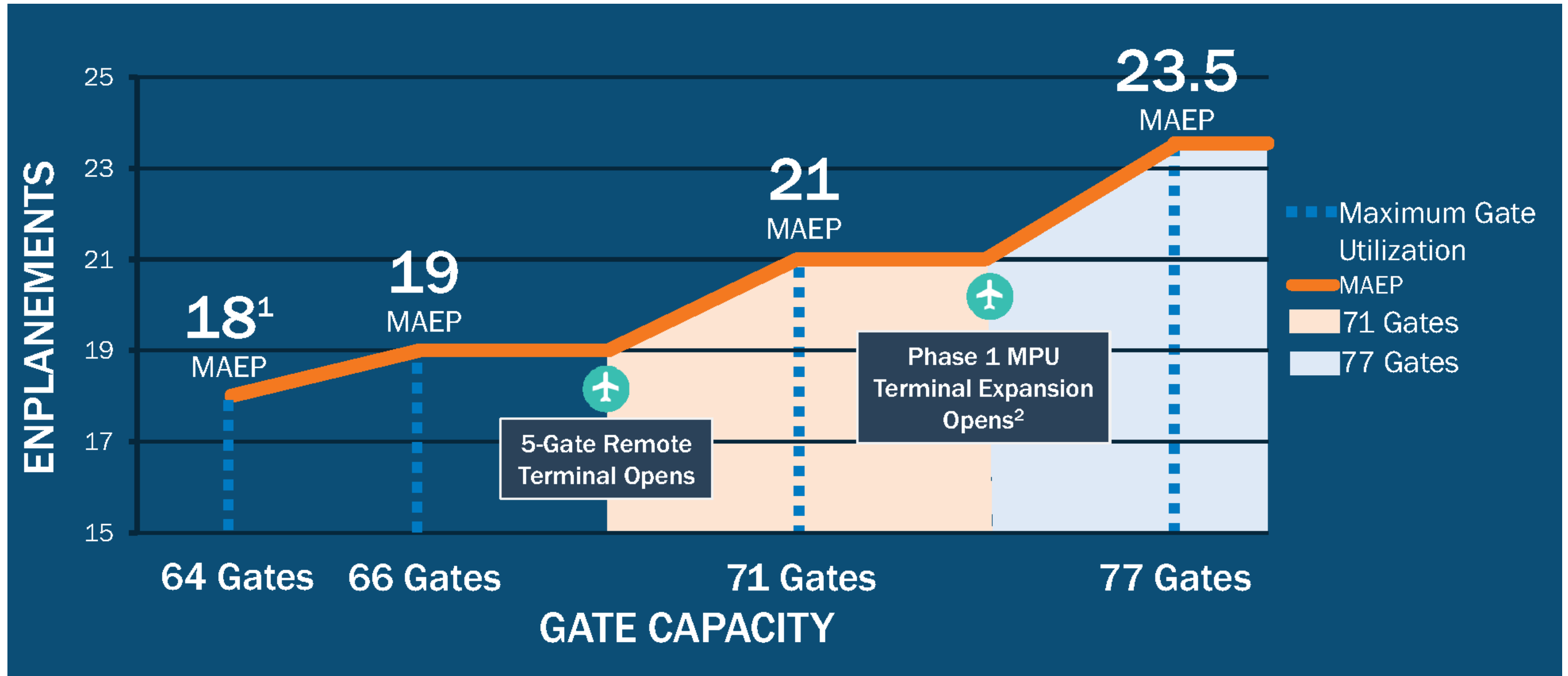
Exhibit 8.6-2 presents the projected overall Airline CPE for the supplemental financial analysis over the Planning Period. As depicted, the overall Airline CPE in current dollars (inflated) is projected to increase from \$10.56 in FY 2020 to \$19.72 in FY 2034. This increase in the overall Airline CPE between FY 2020 and FY 2034 reflects a compound annual growth rate of 4.6 percent. As also shown on Exhibit 8.6-2, the overall Airline CPE in 2018 dollars is projected to increase from \$10.04 in FY 2020 to \$13.15 in FY 2034.

Appendix N provides the financial results of the supplemental financial analysis as presented to the AAAC.



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Exhibit 8.6-1: Projected Gate Capacity



NOTES:

1/ BCAD reported actual enplanements as 18,008,451 for calendar year 2018

2/ Includes making G13 and G14 international capable and relocates 5 existing gates on the southside of Concourse F to the new Concourse G, converting them to international/domestic swing gates

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

PREPARED BY: Ricondo & Associates, Inc., July 2019.

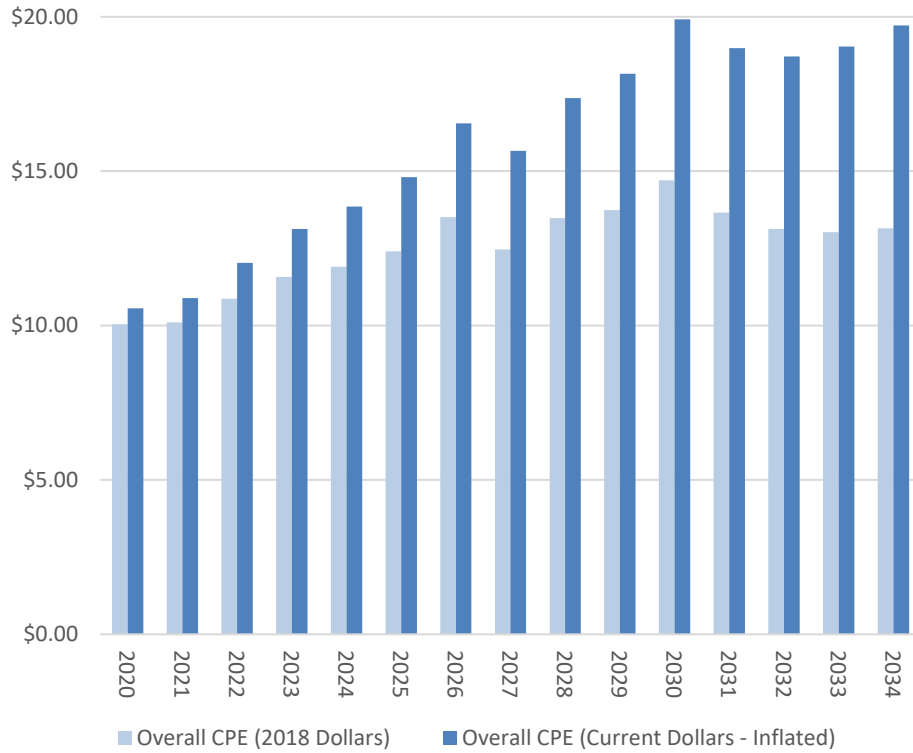


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Exhibit 8.6-2: Projected Cost Per Enplaned Passenger (Supplemental)

Based on the Series 2019 Airport System Revenue Bonds, the FY2020 CPE is estimated to be \$7.92.



NOTE:

For fiscal years ending September 30.

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

PREPARED BY: Ricondo & Associates, Inc., July 2019.



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