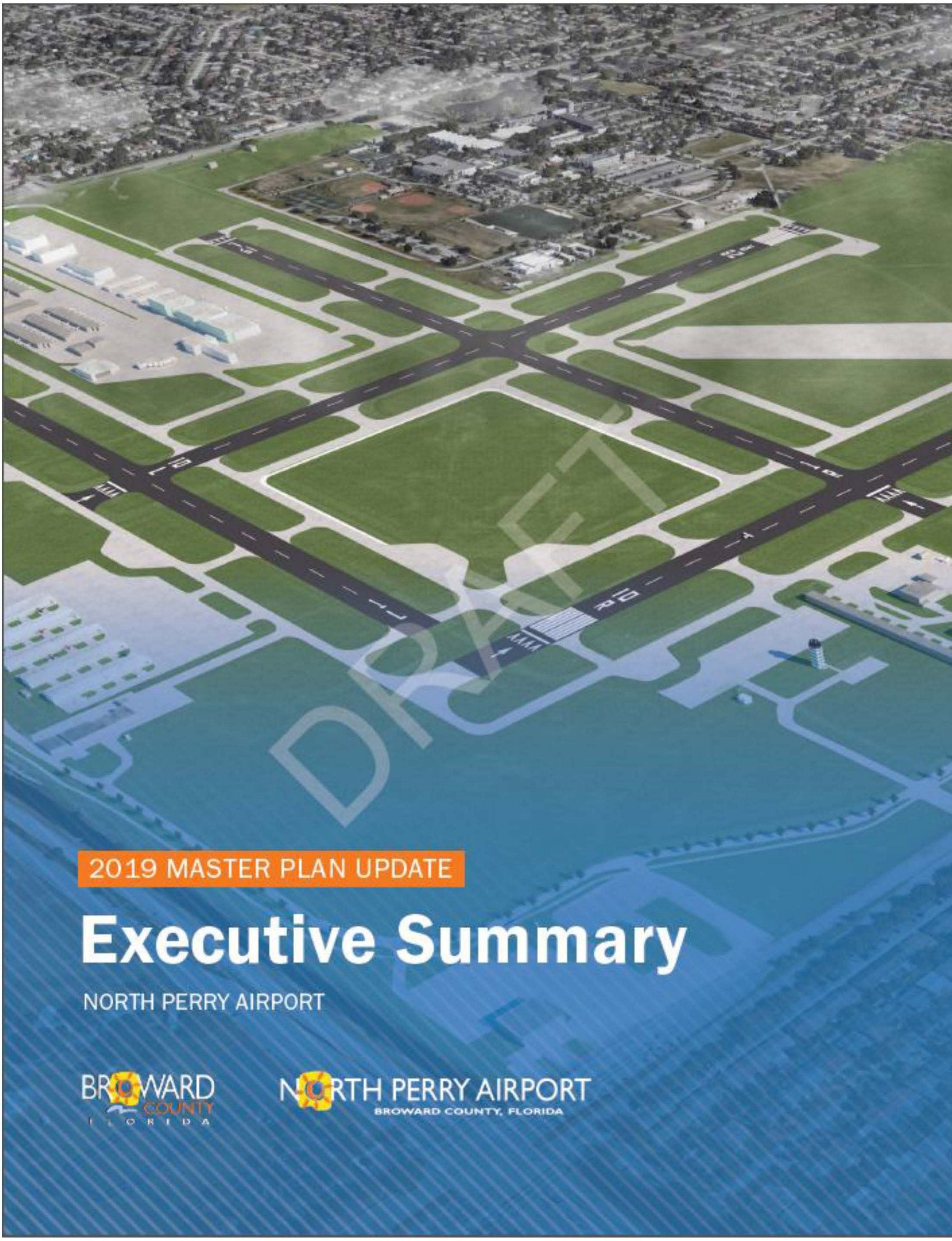

2019 MASTER PLAN UPDATE

Executive Summary

NORTH PERRY AIRPORT

BROWARD COUNTY FLORIDA

NORTH PERRY AIRPORT
BROWARD COUNTY, FLORIDA

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1 Introduction

The North Perry Airport (HWO or the Airport) is owned by Broward County and operated by the Broward County Aviation Department (BCAD), with oversight from the Board of County Commissioners. The Airport is in southern Broward County, seven miles southwest of the Fort Lauderdale-Hollywood International Airport (FLL). HWO comprises approximately 522 acres of land and plays a vital role in the regional transportation system by accommodating light general aviation (GA) activity.

A master plan provides a guide for efficiently accommodating current and future aviation demand, while preserving the flexibility to respond to a continually evolving industry. The Master Plan Update (MPU) for HWO was initiated in November of 2015. The MPU has been funded with a combination of Federal Aviation Administration (FAA) and Florida Department of Transportation (FDOT) grants, along with Airport revenues. It represents a roadmap for implementing recommended airport enhancements necessary to serve demand during the next 20 years and beyond in an incremental and financially affordable manner. The MPU will help define the next chapter for HWO as it continues to fulfill Broward County's GA market.

HWO is a public use, GA airport that is classified as a "reliever airport" in the Federal Aviation Administration's (FAA's) National Plan of Integrated Airport Systems (NPIAS). Within this role, HWO serves light GA aircraft that would otherwise utilize larger commercial service airports, such as FLL. This enhances the efficiency and operational safety of the local air transportation system. HWO is further classified in the NPIAS as a "regional airport". A regional airport is in a metropolitan area, supports a regional economy with interstate and long-distance flying, and has high levels of activity.

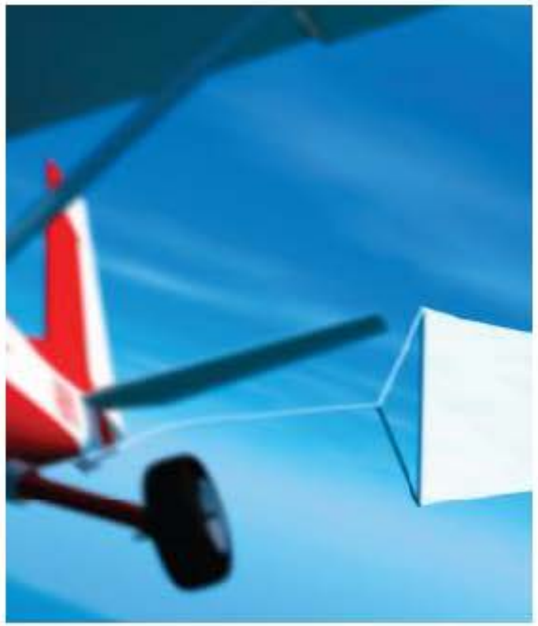
This executive summary provides an overview of data collected, assumptions, technical analyses, findings, conclusions, and recommended airport enhancements of the MPU. Additional detailed information related to the MPU is available in the complete report. Projects will be implemented based upon demand growth and facility or infrastructure needs, funding opportunities, and affordability.

1.1 Baseline Conditions

HWO is located within the City of Pembroke Pines. The City of Miramar also borders the southern boundary of the Airport. Medical and commercial development exists immediately west of the Airport and Broward College's Judson A. Samuels South Campus is located immediately to northeast. Residential development also surrounds the Airport.

HWO's airfield has four existing runways, consisting of two sets of parallel runways; one set in an east-west orientation, the other in a north-south orientation. All four runways are 100 feet wide and vary in length from 3,240 feet to 3,350 feet. The airfield also includes a vast network of taxiways that provide aircraft access to tenant facilities to the north and south of the airfield. The northwest corner of the airport is currently dedicated to banner towing pick-up and drop-off operations. Per Broward County Ordinance, HWO's airfield is restricted to aircraft weighing 12,500 pounds or less. This primarily consists of piston and turboprop aircraft, helicopters, and a very limited number of light jet aircraft and airships (blimps).

As one of the busiest GA airports in the region, HWO serves a broad range of aeronautical market segments. There are numerous tenants that provide aeronautical related services.

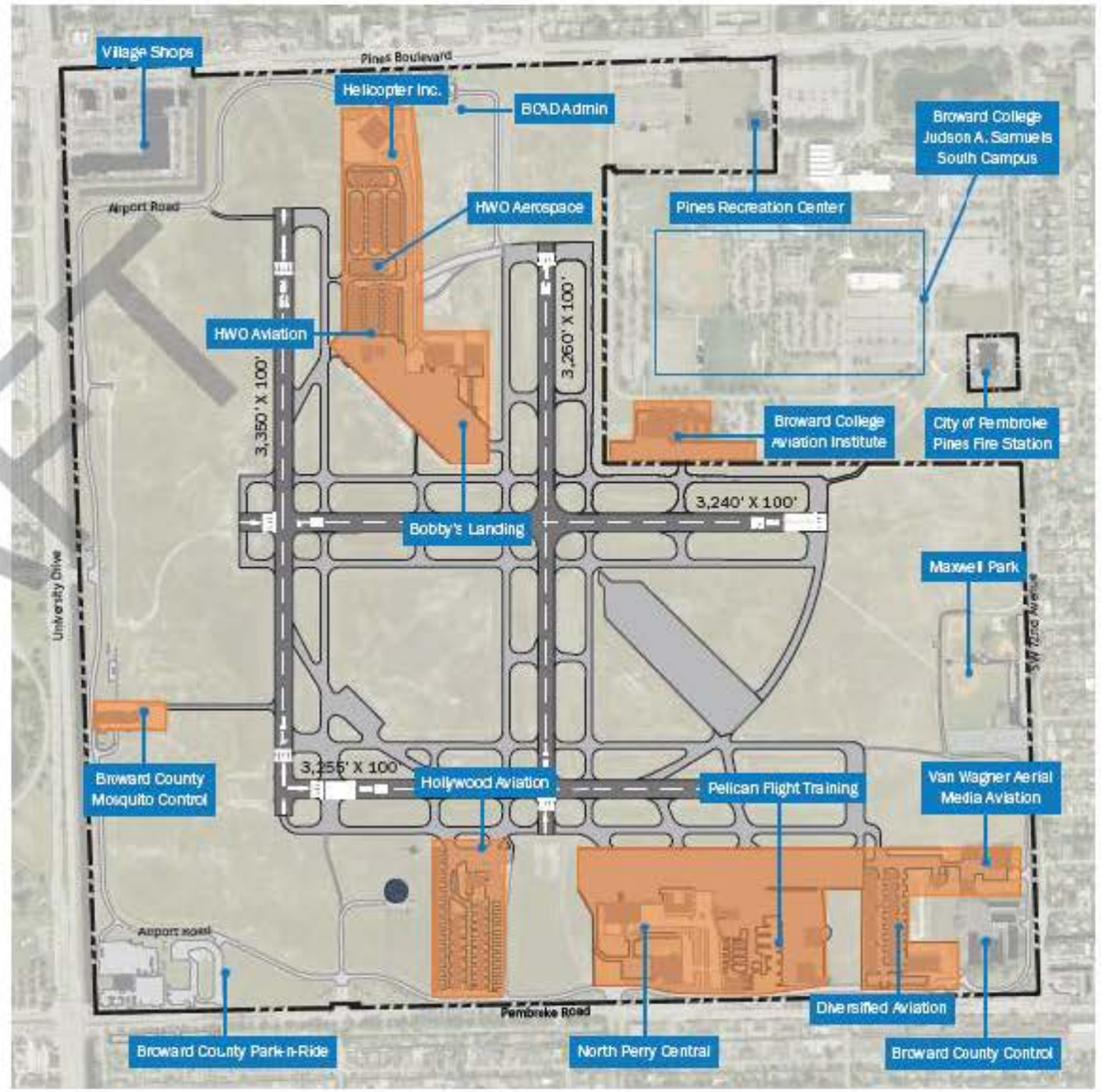


In addition to aeronautical development, several other commercial, recreational, ground transportation, and public safety functions reside on the Airport. This includes the Villages Shops, Pines Recreation Center, Maxwell Park, Broward County Park-n-Ride, and the City of Pembroke Pines Fire Rescue Station #33.

Existing Tenant Base and Users as of April 2018

- Approximately 45 aviation businesses and flight schools
- 4 Fixed-Base Operators (FBO)
- Emil Buehler Aviation Institute at Broward College uses HWO
- HWO also supports the following aviation activities ard jobs:
  - Aerial advertising
  - Aircraft detailing
  - Aircraft fueling
  - Aircraft maintenance
  - Aircraft parking
  - Airship mooring
  - Avionics repair and training
  - Charter
  - Civil Air Patrol
  - Flight training
  - Florida Aero Club
  - Helicopter tours
  - Metro helicopter services
  - Mosquito control

North Perry Airport



Legend

- Airport Property Boundary
- General Aviation Facilities
- Air Traffic Control Tower

SOURCE: Broward County Aviation Department, 2018.

2 The Master Plan Process

The FAA recommends airport master plans be updated every five to ten years, or as necessary, to verify the Airport's compatibility with aviation industry trends and local area development. The Airport MPU was completed in accordance with federal and state guidelines found in FAA Advisory Circular 150/5070-6B, Airport Master Plans and the FDOT Guidebook for Airport Master Planning. These guidelines include the required study elements to develop a comprehensive airport plan that meets the aviation demand for a 20+ year planning period in an incremental, demand-driven, and affordable manner. The development of the MPU was guided by the goals and objectives illustrated on the right.

The MPU includes a comprehensive assessment of Airport assets. These assets include: the airfield, tenant facilities, roadways and other support facilities, such as BCAD administration and maintenance, and the air traffic control tower. Future airport facility and infrastructure needs are triggered by increases in aeronautical activity, tenant development initiatives, and replacement of aging facilities and infrastructure. To quantify future facility development needs and establish the sequencing of future development, airport activity forecasts were derived. The activity forecasts were submitted to the FAA for review and approval.

The MPU also identifies on-Airport areas for potential non-aeronautical development and opportunities to enhance the Airport's integration into the surrounding community. The HWO MPU culminates with the development of an Airport Layout Plan (ALP), which graphically depicts existing and proposed airport enhancements, as well as a capital improvement program (CIP) that will guide the incremental development of the Airport.

The MPU for HWO began in November 2015 and the airport activity forecasts were approved by the FAA in April 2017. The final technical analyses for the MPU were completed in Summer 2019. After review by stakeholders and acceptance by the BOCC, the final technical report and an ALP drawing set were completed in Fall 2019.

2019 Master Plan Goals and Objectives

ENHANCE
Operational safety

INTEGRATE
With the surrounding community

RESPOND
To immediate and near-term needs

UPGRADE
Facilities to satisfy current and future demand

DIVERSIFY
Airport revenue base

PRESERVE
HWO's Role
- HWO's Role
- Light General Aviation Market
- Reliever Airport (to FLL)

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

2.1 Related Studies

HWO's last MPU was approved in 2009 and recommended a variety of airfield improvements. The recommended airfield improvements were based on FAA airfield design standards in effect at the time. In the interim, the FAA revised the airfield design standards. The FAA's new airfield design standards, which focused on measures to avoid aircraft from inadvertently entering the runway environment, necessitated BCAD to reevaluate the airfield improvements that were recommended during the previous HWO MPU.

BCAD commissioned a study called an "Airfield Safety Enhancement and Geometry (ASEG) Study". This study commenced concurrently with the MPU and was completed in April 2017. The Study included information that was also relevant to the MPU, including preparation of an airport activity forecast for HWO. Therefore, to avoid duplication of efforts between the ASEG Study and the HWO MPU, the airport activity forecasts were adopted for use in the HWO MPU. Furthermore, the airfield improvements recommended by the ASEG Study were reviewed and validated during the Master Plan Update process and many projects, particularly the proposed taxiway modifications, were incorporated into this MPU.

The Master Planning Process and Sequence of Tasks

SOURCES: Federal Aviation Administration, Advisory Circular 150/5070-6B, *Airport Master Plans*, January 27, 2015; Florida Department of Transportation, *Guidebook for Airport Master Planning*, 2017; Ricondo & Associates, Inc., September 2018.

3 Future Aviation Activity Projections

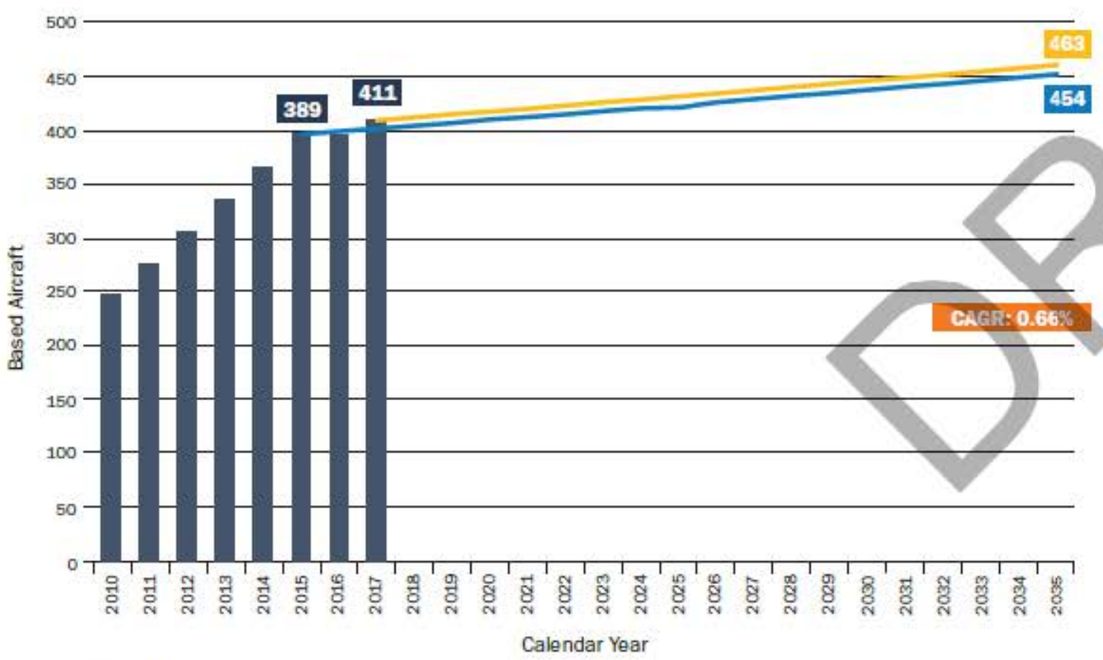
Future airport activity projections provide the basis for determining facility requirements and defining the type and extent of future airport enhancements. Airport activity projections generally focus on based aircraft and total operations.

- Based aircraft are aircraft that reside primarily at the Airport and are stored in hangars or on the aircraft parking apron. In addition to aircraft storage requirements, based aircraft numbers influence aircraft maintenance and other supporting aeronautical service offerings.
- Aircraft operations are defined as either a takeoff or a landing on one of HWO's runways. Touch and go operations, which are associated with flight training activities, are considered two operations, one landing and one takeoff. Aircraft operational demand levels dictate the needs for airfield infrastructure, aircraft fuel storage, and transient aircraft storage.

As previously noted, airport activity forecasts derived during the ASEG Study were utilized for the HWO MPU. The ASEG Study forecasts for based aircraft and aircraft operations were developed for calendar year (CY) 2015 through CY 2035 (which represents a 20-year planning horizon). The forecasts applied a compound annual growth rate (CAGR) of 0.66 percent to both based aircraft and aircraft operations. The ASEG Study forecasts were reviewed by the FAA and approved April 28, 2017.

While the ASEG Study forecasts projected continued steady growth, the actual aircraft operations totals for CY 2017 exceeded the demand levels projected for CY 2035. To ensure that the MPU's activity projections (and resulting facility requirements) reflected the recent surge in activity, an MPU Sensitivity Analysis forecast was developed. This was achieved by applying the FAA approved CAGR of 0.66 percent to the Airport's CY 2017's actual based aircraft and aircraft operational demand levels. The higher forecasts associated with the MPU's Sensitivity Analysis forecast form the basis for long range planning during the MPU.

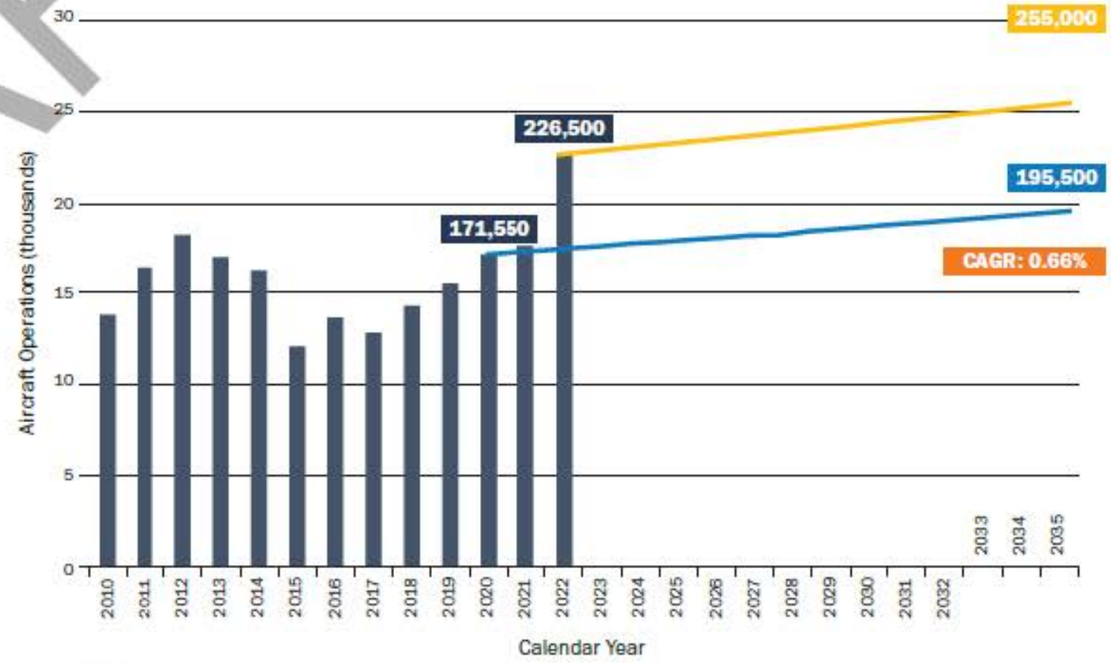
Based Aircraft Forecast



Legend
- Historical Based Aircraft
- ASEG Study Forecas:
- MPU Sensitivity Analysis Forecast

NOTE: CAGR - Compound Annual Growth Rate
SOURCES: FAA Air Traffic Activity System (ATADS), March 2018 (historical data); Kimley-Horn and Associates, April 2017 (forecast data), Inc.; Ricondo & Associates, Inc., June 2018.

Aircraft Operations Forecast



Legend
- Historical Aircraft Operations
- ASEG Study Forecast
- MPU Sensitivity Analysis Forecast

NOTE: CAGR - Compound Annual Growth Rate
SOURCES: FAA Air Traffic Activity System (ATADS), March 2018 (historical data); Kimley-Horn and Associates, April 2017 (forecast data), Inc.; Ricondo & Associates, Inc., June 2018.

4 Demand/Capacity Analysis and Facility Requirements

The realization of the future airport activity projections is dependent on the availability of the facilities and infrastructure needed to efficiently and effectively accommodate existing and forecast aviation demand. Demand/capacity analyses determine the capacities of the existing airfield, landside, and various other airport support facilities relative to their capabilities for accommodating projected future demand. The results of the demand/capacity analyses set the framework for developing future strategies to develop the Airport in a prudent and cost-effective manner while accommodating forecast aviation activity. The demand/capacity analyses and subsequent establishment of facility requirements form the basis for the identification and assessment of airport enhancements.

The facility development needs that would be required to serve the activity projections associated with the MPU Sensitivity Analysis forecast for 2035 were calculated. This included the facility requirements that reflect those improvements necessary to meet growing demand and potentially changing demand characteristics. It also includes improvements necessary to maintain and/or upgrade existing infrastructure, systems, and facilities. HWO requires additional airfield modifications and GA or support facilities to improve operational efficiency and serve the anticipated activity levels projected through 2035. Facility requirements for future Airport facilities and infrastructure are defined for three key functional areas.

Airfield – Airfield elements that support the arrival, departure, and ground circulation of aircraft. This includes the area dedicated to the pick-up and drop-off of aerial banners in the northwest quadrant of the Airport.

HWO's four runways were found to be adequate to serve the future activity projected in both the ASEG Study forecast and the MPU Sensitivity Analysis forecast through the 20-year planning horizon. An additional parallel taxiway west of Runway 1L-19R is recommended to facilitate aircraft movements to and from the future westside development areas. Other taxiway pavement geometry modifications necessary to conform with current FAA design standards identified during the ASEG Study were also reassessed and refined as necessary.

General Aviation (GA) / Fixed-Base Operator (FBO) Facilities – This includes FBO terminal facilities, aircraft parking (apron and hangar), aircraft maintenance hangars and shops, flight training centers, and vehicular parking.

Approximately 22 acres of existing Airport property is needed to accommodate future aeronautical tenant facility development projected in the MPU Sensitivity Analysis forecast. This includes space for aircraft storage, maintenance hangars, shops, passenger and flight crew amenities, classrooms, and vehicular parking.

Aviation Support Facilities and Infrastructure – This includes Air Traffic Control (ATC) tower, BCAD administration/maintenance facilities, fuel storage, and utilities.

Expansion of BCAD's administrative and maintenance facilities and the replacement of the ATC tower will be required. The land area to support the expansion of the BCAD facilities and ATC tower is estimated to be less than a half-acre.

Summary of Future Facility Requirements

Airfield	Existing (Quantity)	Total Capacity Needed to Serve 20-Year Forecasts (Quantity)	20-Year Future Facility Requirements (Quantity)
Runways	4	4	0
Parallel Taxiways	7	8	1

Facility Type	Existing (Acres)	Total Capacity Needed to Serve 20-Year Forecasts (Acres)	20-Year Future Facility Requirements (Acres)
General Aviation/Fixed-Base Operator (FBO)			
Aircraft Storage	41.3	54.6	13.3
Tenant Facilities	27.8	36.2	8.4
Subtotal - GA/FBO	**69.1**	**90.8**	**21.7**
Aviation Support Facilities			
Air Traffic Control Tower	0.9	0.9	None
Airport Administration and Maintenance	0.1	0.2	0.1
Subtotal - Support Facilities	**1.0**	**1.1**	**0.1**
Grand Total (Acres)	**70.1**	**90.8**	**21.8**

SOURCES: American Infrastructure Development, Inc., August 2018; Ricondo & Associates, Inc., September 2018.

5 Recommended Airport Enhancements

The MPU's Demand/Capacity Analysis identified not only the need for additional capacity, but other improvements, such as replacing aging infrastructure, that will ensure the Airport receives the most benefit from additional capacity. The MPU focused on the following functional areas for development:

- Airfield
- Tenant Facilities
- Support Facilities

Landside enhancements were also identified. This included roadway access improvements, enhancements to existing on-Airport roadways, and utility infrastructure to support future tenant development.

The planning approach was customized to meet the unique operational needs of each functional area. Enhancement alternatives were established for each functional area. The various airport enhancement alternatives were identified and evaluated during a series of interactive work sessions. These work sessions involved various members of BCAD's executive team, airport tenants, and other key stakeholders. During these work sessions, open discussions relative to the location and configuration of future (additional) facilities or replacement facilities were undertaken. These interactive discussions comprised the advantages, disadvantages, and tradeoffs of placing facilities at various sites, as well as the configurations and layout for the proposed facilities, from both operational and land use perspectives. The resulting preliminary recommendations were also presented to the public during an open house workshop. The public workshop and briefings solicited feedback prior to selecting the recommended airport enhancements.

Airfield Modifications

However, the ASEG Study recommended a variety of modifications to the airfield's pavement geometry and electrical system. These modifications were intended to enhance operational safety and efficiency by implementing the following actions:

Airfield pavement geometry and safety enhancements:

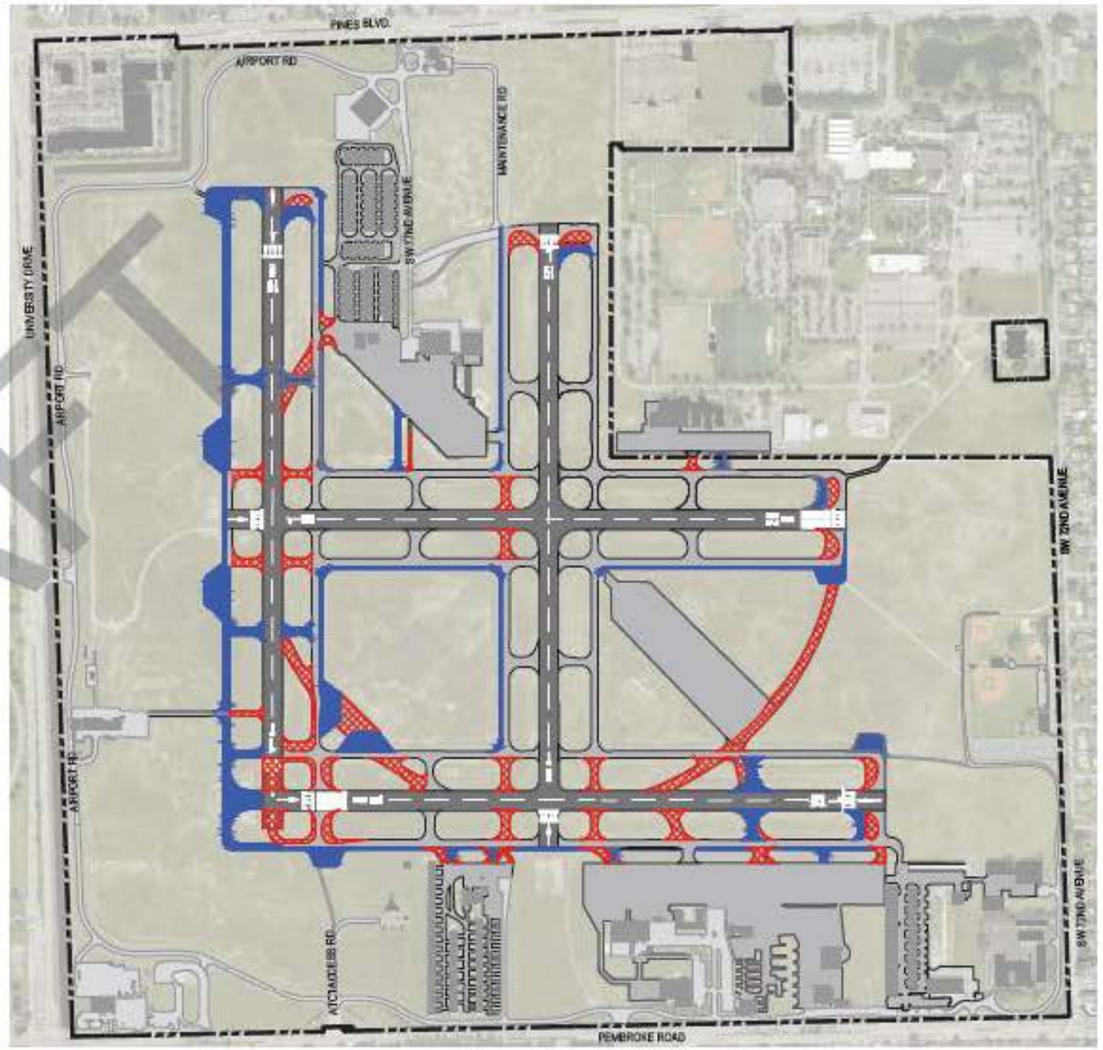
- mitigating potential runway incursions (inadvertent encroachment of an active runway), including the mitigation of Hot Spots 1, 2, and 3. A hot spot is defined as a location on an airport movement area with a history of potential risk of collision or runway incursion, and where heightened attention by pilots and drivers is necessary;
- ensuring compliance with current FAA design standards;
- enhancing airfield access for future aeronautical tenant development;
- creating dedicated holding bays for aircraft run-up and pre-flight checks; and
- eliminating antiquated and/or excessive airfield pavements.

Airfield electrical improvements:

- installing runway guard lights at select runway entrances;
- installing runway and taxiway edge lighting and signage; and
- replacing the airfield electrical vault.

The refinements to the airfield enhancements that were recommended during the ASEG Study serve as the airfield configuration upon which all other airport enhancements are built upon.

Proposed Airfield Enhancements



Legend

- Existing Airport Property Line
- Existing Apron and Taxiway Pavement
- Existing Buildings
- Existing Runway Pavement
- Future Pavement Removal
- Future Pavement

SOURCES: Ricondo & Associates, Inc., April 2019; Kimley-Horn and Associates, Inc., Airfield Safety Enhancement and Geometry Study, April 2017.

Future Tenant Facility Development Land Use Priorities

HWO has approximately 92 acres of property available for future development. Therefore, HWO currently has more than adequate land to accommodate the 22 acres of land needed for aeronautical tenant and airport support as projected for the 20-year planning horizon. The resulting land surplus provides an opportunity for BCAD to supplement its revenue base through either non-aeronautical development or soliciting other types of aeronautical service providers that do not currently reside at the Airport.

To facilitate the prioritization of future on-Airport development, a series of land use development plan options were developed and evaluated. This culminated with the identification of a Preferred Land Use Plan to guide future development initiates at HWO. To aid in the identification of the properties best suited to accommodate the future requirements, 12 individual on-Airport parcels were identified that are either currently vacant or available for redevelopment.

Parcels Available for Future Tenant Development*

- two parcels north of Runway 10L-28R (Parcels 1 and 2);
- three parcels between Runways 10L-28R and 10R-28L (Parcels 3, 4, and 5); and
- seven parcels south of Runway 10R-28L (Parcels 6 through 12).

*Available parcels and their locations depicted on Page 18.

Each of the 12 parcels were evaluated based on several factors, including:

- landside and airfield access,
- current tenant facility expansion initiatives,
- adjacency to existing tenant facilities,
- parcel configuration,
- utility availability, and
- potential development constraints.

To prioritize the parcels that would support future aeronautical and non-aeronautical development at HWO, four land use plan options were developed and evaluated. Based on the consideration of the evaluation factors with BCAD staff and stakeholders, a preferred land use plan was identified. The preferred land use plan considered the following land use categories:

Preferred Land Use Plan

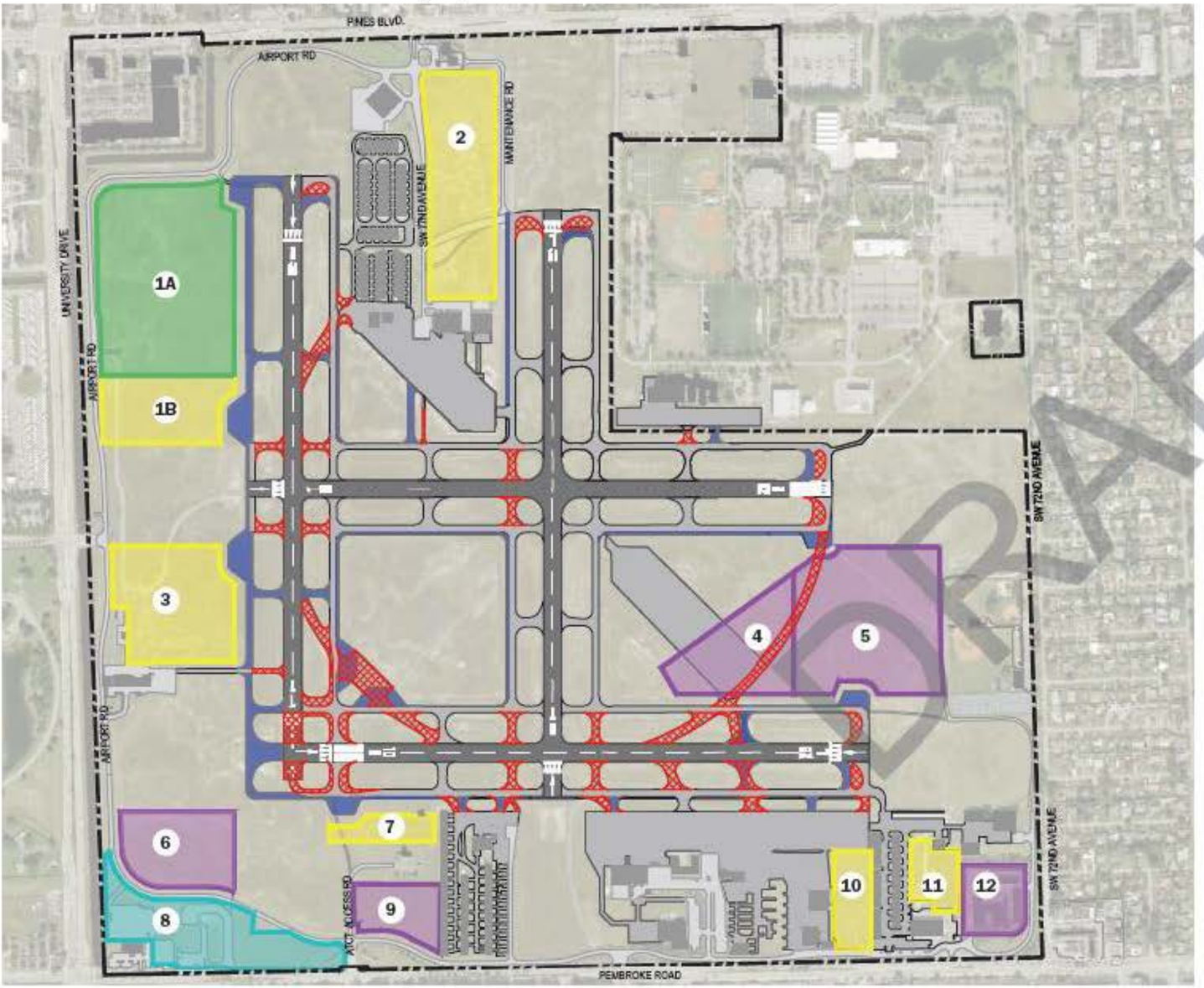
Airfield Operations Area
These parcels include areas preserved for runways, taxiways, banner towing operations, or air ship staging areas. Of the 12 parcels evaluated, the northern portion of **Parcel 1 (sub- parcel 1A)** will be maintained for banner towing pick-up and drop-off operations.

Aeronautical Use
These parcels would primarily accommodate aircraft storage (hangars and apron), aircraft maintenance hangars and shops, as well as other supporting infrastructure. These parcels must be adjacent to the airfield to facilitate aircraft accessibility. Due to their adjacency to existing aeronautical tenant facilities, **Parcels 2, 7, 10, and 11** have been identified for future aeronautical uses. This would also tenants with adjacent leaseholds to expand existing facilities, should the adjacent tenants require future tenant expansion. The southern portion of **Parcel 1 (sub-parcel 1B) and Parcel 3** are also recommended for future aeronautical tenant development given their proximity to the airfield, existing utilities, and landside infrastructure needed for vehicular access. Parcels 1B and 3 could serve new entrant tenants, or remote development by existing tenants.

Parcel 3 is located in close proximity to the Airport's radio communications tower and rotating beacon. Future development within this parcel must not interfere with these two facilites. Development on Parcel 3 may be subject to height restrictions to avoid impacting these facilities. Therefore, it is recommended that future facility development on Parcel 3 be restricted to single story structures such as T-hangars and/or aircraft parking apron.

Development on Parcels 1B and 3 must also be compatible with the banner tower operations associated with Parcel 1A.

Preferred Land Use Plan – North Perry Airport



Legend	Size (Acres)
Non-Aeronautical Development	
Parcel 8	8.7
Subtotal	**8.7**
Aeronautical Development	
Parcel 1B	6.9
Parcel 2	10.8
Parcel 3	9.1
Parcel 7	1.8
Parcel 10 and Parcel 11	4.6
Subtotal	**33.2**
Surplus/Demand Driven	
Parcel 4	6.8
Parcel 5	15.2
Parcel 6	5.8
Parcel 9	3.2
Parcel 12	2.9
Subtotal	**33.9**
Airfield Operations Area	
Parcel 1A (Banner Towing)	15.9
Subtotal	**15.9**
Total for Area Development	**91.7**

Legend
- Existing Airport Property Line
- Existing Runway Pavement
- Existing Apron and Taxiway Pavement
- Future Pavement Removal
- Future Apron and Taxiway Pavement
- Existing Buildings
- Aeronautical Development Land
- Non-Aeronautical Development Land
- Surplus/Demand Driven Land
- Airfield Operations Area

Non-Aeronautical Use
Parcels that are not adjacent to the airfield are designated for non-aeronautical development opportunities. This may include, but is not limited to commercial, retail, or industrial purposes. Parcel 8 is the only parcel that does not have airfield access, and therefore is limited to nor-aeronautical development. This parcel currently serves as a park-and-ride lot for Broward County Transit, but could be redeveloped for other revenue generating purposes.

Surplus/Demand Driven
Any remaining parcels that are contiguous to the airfield and could be developed as either aeronautical or non-aeronautical uses are designated as surplus/demand driven. This land use category provides BCAD with the ability to maximize the revenue generating capability of these parcels by providing the flexibility to develop either aeronautical or non-aeronautical development as development opportunities arise. **Parcels 4, 5, 6, 9, and 12** have been designated as Surplus/Demand Driven.

SOURCES: American Infrastructure Development, Inc., May 2018; Kimley-Horn and Associates, Inc., *HWO Airfield Safety Enhancement and Geometry Study*, April 2017; Ricondo & Associates, Inc., April 2019.

Support Facilities

BCAD staff and stakeholders provided input on the airport enhancements for providing the 20-year support facility and infrastructure requirements for HWO. This included the identification of aging facilities and facilities requiring expansion. The recommended airport enhancements are described below:

ATC Tower Replacement
The existing ATC tower was constructed in the 1960s. At approximately 60 years old, it is anticipated that the facility will need to be replaced during the 20-year planning period. The replaced ATC tower is proposed immediately west of the existing ATC tower location. This location would minimize development costs by leveraging the existing utilities and vehicular parking. It would also allow for the construction of a replacement ATC tower to occur while airfield operations are controlled from the existing tower. The proposed ATC tower location would provide controllers with an unobstructed view of the airfield while minimizing the height of the structure.

BCAD Administration & Maintenance Facilities
The existing BCAD Administration and Maintenance Facilities require an additional 2,900 square feet of enclosed building space to accommodate the Airport's administration/ maintenance staffing needs and materials/ equipment storage. The expansion of the BCAD facilities is proposed immediately east of the existing Administration and Maintenance compound.

Landside Improvements

East Side Access Road and Utilities
To facilitate future tenant facility development, the construction of an access road and extension of utilities infrastructure is warranted. The following alternative was evaluated during the MPU:

- Extension of Airport Road

The extension of Airport Road was identified as BCAD's preferred option for providing roadway access to Parcels 4 and 5. This would avoid increasing vehicular traffic demand on Southwest 72nd Avenue immediately east of the Airport. However, this would also require Airport Road to extend through the Runway Protection Zones (RPZs) associated with Runway 10R-28L. An RPZ is an area designated beyond the end of each runway with specific land use controls. These land use controls are intended for the protection of people and property within its boundaries. In accordance with current FAA guidance on RPZs, the extension of Airport Road would qualify as a new land use within the existing RPZs. This would require the completion of an RPZ impact and mitigation study.

Since the development of tenant facilities on Parcels 4 and 5 is currently not imminent, the actual type of development is not known. This would have a direct impact on the traffic levels associated with the landside roadways. Therefore, it is recommended that BCAD delay its selection of a preferred roadway alignment to Parcels 4 and 5 at this time. Once BCAD has a better understanding of the likely facility types to be developed within Parcels 4 and 5, a comprehensive alternatives evaluation can be performed. On that basis, a preferred alignment for roadway access to Parcels 4 and 5 is not being recommended at this time.

Separated Shared-Use Path
The frequent use of Airport Road by pedestrians and cyclists has been identified as a safety concern. As a potential landside safety enhancement, the establishment of a separated shared-use path along Airport Road is proposed. This would segregate pedestrians and cyclists from vehicular traffic along Airport Road. This project would also include lighting and landscaping improvements to improve the aesthetics of the Airport. The shared-use path would parallel Airport Road along the north, west, and south perimeter of the Airport. It should be noted that this project may be implemented in phases, if necessary, and its timelines for implementation is subject to the availability of funding and FAA approval.

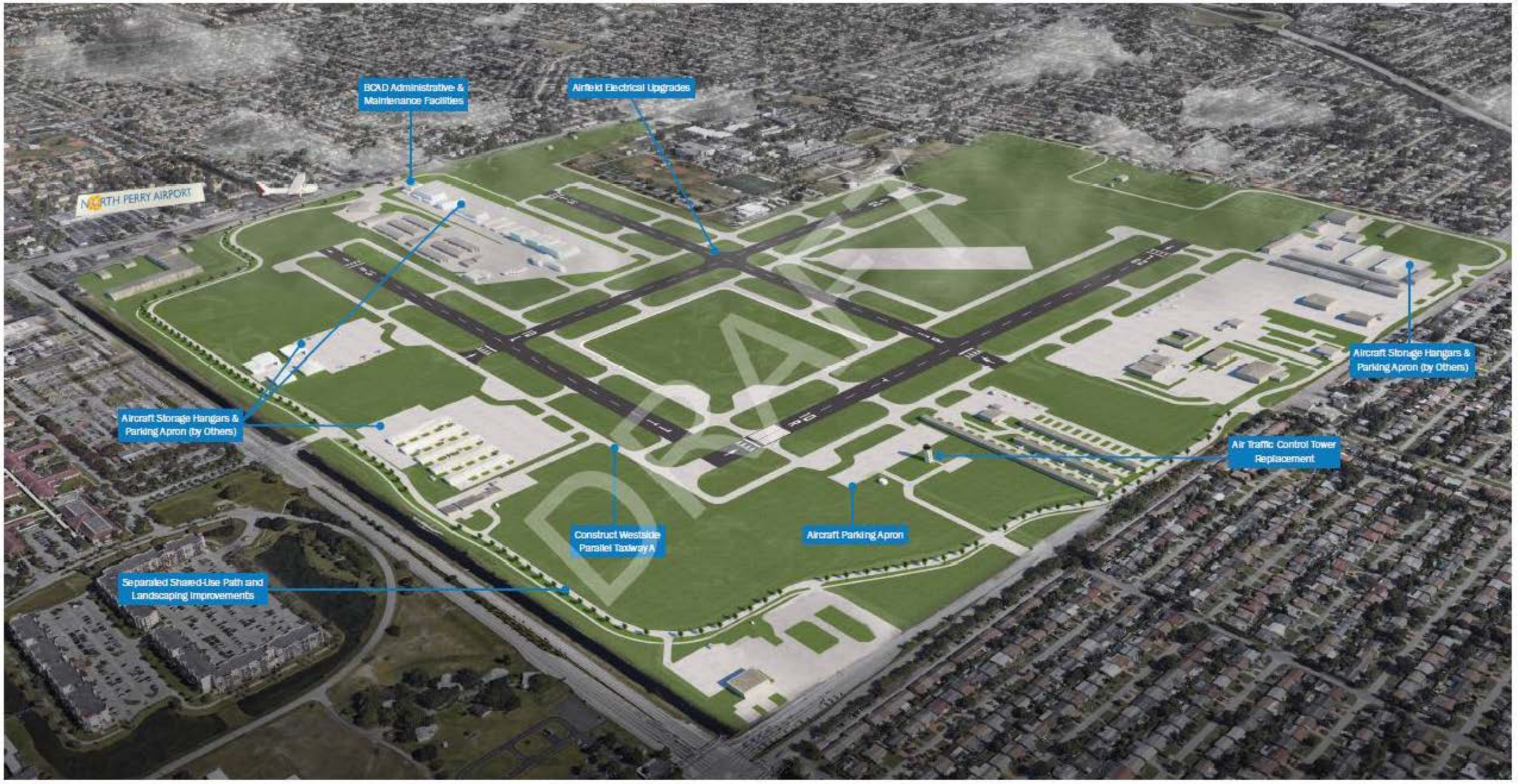
Separated Shared-Use Path*

- Up to 12 to 16 feet wide paved surface
- Landscaped buffer between roadway
- Connects SW 77th Way to Island Drive
- Amenities, including lighting, designed for walkers, joggers, and bicyclists

*Development of shared-use path is dependent on funding availability and FAA Approval.

A rendering of the airport enhancements recommend by the HWO MPU is shown on the following pages.
SOURCE: Ricondo & Associates, Inc., July 2019.

Master Plan Update – 20-Year Airport Enhancements Plan (Conceptual Rendering)



SOURCES: American Infrastructure Development, Inc., May 2018; Kimley-Horn and Associates, Inc., *HWO Airfield Safety Enhancement and Geometry Study*, April 2017; Ricondo & Associates, Inc., April 2019.

6 Program Implementation Phasing

The airport enhancements recommended as part of the MPU will be realized through sensible and gradual development actions over time. Each project would provide incremental benefits and may have independent utility for HWO. The sequencing and timing of each project is driven by a variety of factors, such as: operational demand levels, evolution of the aircraft fleet mix, BCAD and tenant development initiatives, funding availability, age and condition of existing facilities/infrastructure, and regulatory requirements. The proposed sequencing of projects has been divided into three phases:

- Near-term development is projected to occur between fiscal year (FY) 2020 through FY 2024,
- Intermediate-term development would occur between FY 2025 and FY 2029, and
- Long-term development is projected to occur from FY 2030 and beyond.

These three phases estimate the general period (in FYs) for future Airport improvements. However, periodic re-evaluation of the proposed timing will be necessary to accommodate changing development needs or priorities. It is also possible that other improvements not identified in this implementation phasing may be identified in the future to support Airport operations and/or to improve operational efficiency.

Airfield Enhancements

The implementation priorities of the various airfield enhancements prescribed within the ASEG Study were refined during the MPU. The mitigation of three Hot Spots were identified as the top priority, with the mitigation of Hot Spot 2 being implemented first. This will also trigger the need to install airfield lighting and signage along Runway 1R-19L and Taxiway D. The airfield's electrical vault, which houses critical electrical equipment, will also be replaced. The partial construction of the full-length parallel Taxiway A along the west side of Runway 1L-19R and was also prioritized to facilitate future aeronautical development. Collectively, these airfield projects are planned to occur before 2024 and therefore, are included within BCAD's near-term Capital Improvement Program (CIP).

The remaining airfield enhancements will be implemented concurrently with the rehabilitation of the associated airfield pavements. The timing of these enhancements would be in accordance with BCAD's airfield pavement rehabilitation program. These enhancements include additional airfield design standard compliance initiatives, construction of aircraft run-up pads, and relocation of select parallel taxiways to increase their lateral separation from their associated runways. The implementation of these airfield projects is anticipated to occur during the intermediate and long-term planning horizon.

Near-Term (FY 2020 through FY 2024)

1. Mitigate Hotspot 1: Modify Taxiway Crossings to Runway 10L 28R and 1L 10R
2. Mitigate Hotspot 2: Modify Entrances to Runways 1L and 10R and Construct New Run-Up Pads
3. Mitigate Hotspot 3: Reconfigure Apron Entrance Taxilanes South of Taxiway L
4. Airfield Lighting Improvements
5. Mitigate Runway 1L-19R Crossings and Extend Taxiway A
6. Separated Shared-Use Path and Landscaping Along Airport Road
7. Air Traffic Control Tower Replacement

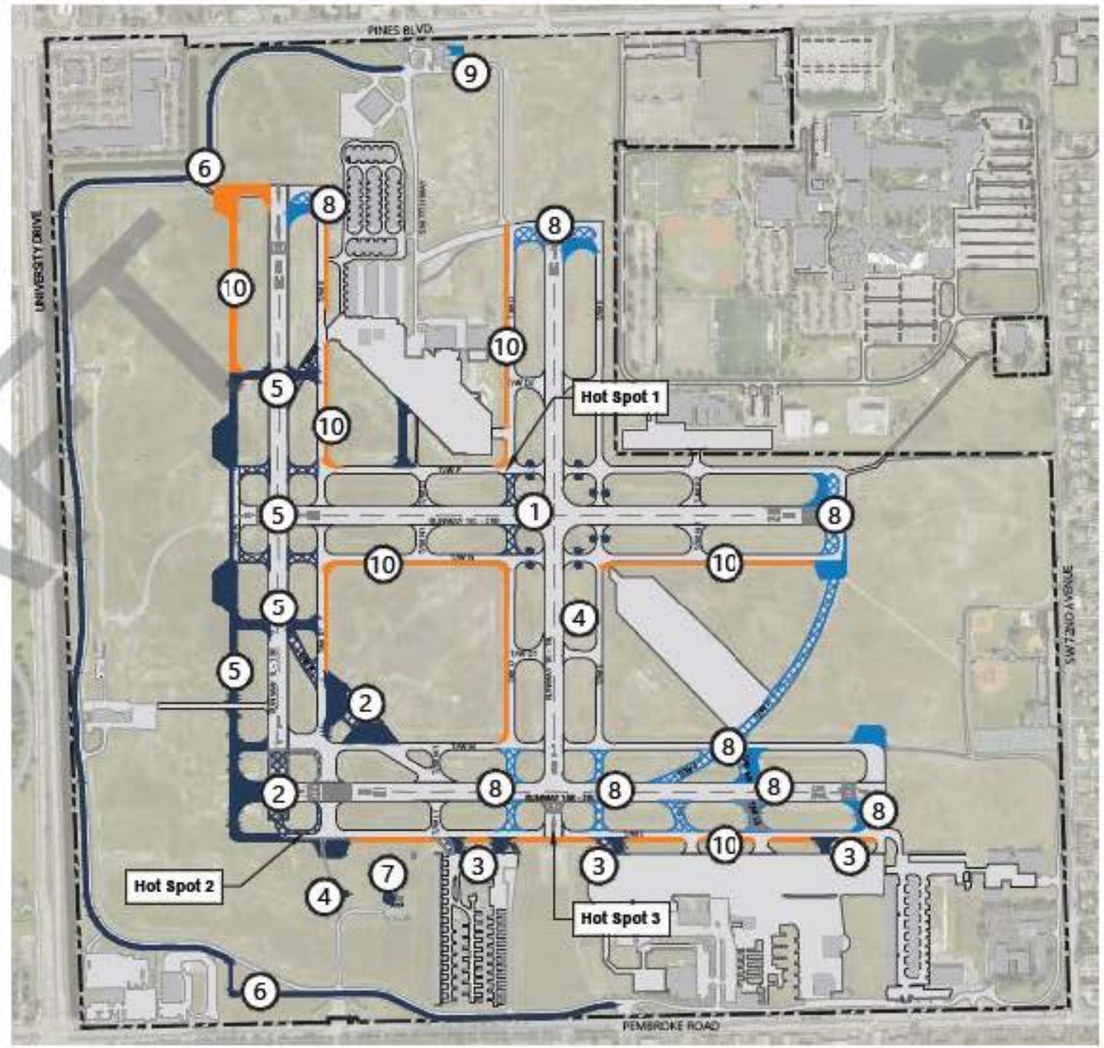
Intermediate-Term (FY 2025 through FY 2029)

8. Phase 2 Airfield Improvements
9. BCAD Administration and Maintenance Facility Expansion

Long-Term (FY 2030 through FY 2035)

10. Phase 3 Airfield Improvements

Recommended Airport Enhancements by Phase



Legend

- Existing Airport Property Line
- Near-term Runway Guard Lights
- Near-term Pavement Demolition
- Near-term Proposed Projects
- Intermediate-term Pavement Demolition
- Intermediate-term Proposed Projects
- Long-term Proposed Projects

SOURCES: American Infrastructue Development, Inc., May 2018; Kimley-Horn and Associates, Inc., *HWO Airfield Safety Enhancement and Geometry Study*, April 2017; Ricondo & Associates, Inc., April 2019.

Tenant Facility Development
While the need for aeronautical tenant facilities is driven by aeronautical demand (based aircraft and itinerant aircraft operations), the development of these facilities will be funded by private developers/tenants. Although BCAD has review and approval authority over future tenant facility development, the tenants will ultimately define the type, configuration, and timing of facility development within their respective leaseholds. Similarly, the development of non-aeronautical tenant facilities will likely be financed by private developers. While BCAD has the ability to limit the type of non-aeronautical facility development at the Airport, the ultimate timing of non-aeronautical development and configuration of facilities will be defined by others. To facilitate tenant development on certain parcels, however, certain infrastructure improvements, such as roadway access, airfield access, and/or utilities may be necessary in advance of construction. These enabling projects would likely be undertaken by BCAD or other local agencies.

Other Recommended Airport Enhancements
The remaining airport enhancement initiatives were prioritized in consultation with BCAD staff and stakeholders. Due to the safety benefits to pedestrians and cyclists, the construction of the shared use path along Airport Road was identified as a top priority. The replacement of the ATC tower is also considered a top priority, as the existing ATC tower is old and antiquated. These two projects will be implemented under the near-term CIP, while the planned expansion of the BCAD Airport Administration and Maintenance facilities are to be implemented in the intermediate planning horizon.

7 Project Funding

Project funding sources include federal grants from the FAA, state grants from the FDOT, and local funds from BCAD or other agencies. It is important to note that specific project eligibility for federal and state grant funding varies depending on the type of project. Actual financing strategies used will be determined as implementation approaches. Typical funding sources include:

- **Federal Grants –** The FAA distributes federal grants under the Airport Improvement Program (AIP) to airport operators in two ways: entitlement grants and discretionary grants. Entitlement grants for GA airports that are included in the NPIAS, such as HWO, are referred to as non-primary entitlement grants. BCAD is eligible to receive up to $150,000 annually in non-primary entitlement grants for airfield capital projects and eligible maintenance projects. Discretionary grants are distributed for individual projects based on funding availability and the priority of projects at airports nationwide. Projects given the highest priority according to the AIP are those that satisfy objectives related to safety, security, reconstruction, capacity and standards.
- **State Grants –** FDOT grants are funded from the State Transportation Trust Fund, which consists, in part, of funds collected through the state's aviation fuel tax. The FDOT grant program was established to fund projects relating to airport planning and capital improvements that address safety, security, or capacity improvements; land acquisition; and economic development. Historically, for projects that receive AIP grants, FDOT has contributed up to 50 percent of the remaining share of the project cost. For projects that do not receive AIP funding, the FDOT will provide up to 80 percent of the funding for most non-FAA-supported project costs. For economic development projects, FDOT may provide up to 50 percent of the costs to build on-Airport, revenue producing capital improvements.
- **Local Funds –** Local funds may be provided by BCAD or other local funding agencies for projects not eligible for federal or state funding and to account for shortfalls in funding levels. Local funding shares can be as little as 5 percent for projects that receive a combination of FAA and FDOT grants or up to 100 percent for projects not receiving federal or state funds. Local funds are typically obtained from Airport revenues and are identified in the County's fiscal budgeting cycles.

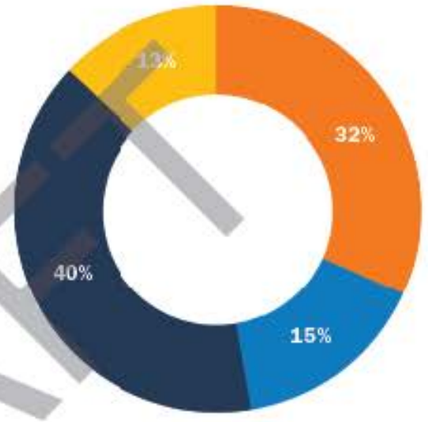
The master planning process, implementation plan, and estimated costs, coupled with other projects identified by BCAD needed to preserve existing facilities and infrastructure, or necessary to improve other operational aspects of the Airport, culminate in a CIP for HWO.

Capital Improvement Program by Funding Sources[1]

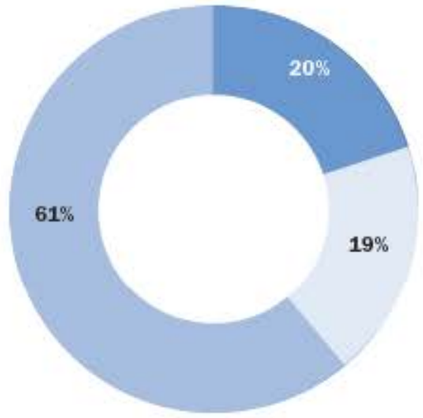
Project Name	Target Year Construction (Fiscal Year)[2]	Total Project Costs (Escalated)[3]	FAA	FDOT	Local[4]
BCAD CIP					
Phase II Security Improvements	2019	$1,187,686	$0	$950,149	$237,537
Dual Taxilane (Wayman Aviation)	2019	$840,288	$0	$672,230	$168,058
Runway 10R-28L Rehabilitation	2020	$4,750,745	$4,275,671	$237,537	$237,537
Subtotal BCAD CIP		**$6,778,719**	**$4,275,671**	**$1,859,916**	**$643,132**
Near-Term					
Mitigate Hot Spot #2	2021	$4,400,000	$3,960,000	$220,000	$220,000
Airfield Lighting Improvements	2021	$2,200,000	$0	$1,760,000	$440,000
Mitigate Runway 1L-19R Crossings and Extend Taxiway A	2021	$3,700,000	$0	$2,960,000	$740,000
Mitigate Hot Spot #1	2024	$1,100,000	$990,000	$55,000	$55,000
Mitigate Hot Spot #3	2023	$800,000	$720,000	$40,000	$40,000
Air Traffic Control Tower Replacement	2022	$4,800,000	$0	$3,840,000	$960,000
Separated Shared-Use Path and Landscaping Along Airport Road	2022	$2,250,000	$0	$1,800,000	$450,000
Advanced Planning (Professional Services)[5]	N/A	$1,500,000	$0	$0	$1,500,000
Subtotal Near-Term		**$20,750,000**	**$5,670,000**	**$10,675,000**	**$4,405,000**
Intermediate-Term					
Phase 2 Airfield Improvements	2027	$6,000,000	$0	$4,800,000	$1,200,000
BCAD Administration and Maintenance Facility Expansion	2025	$1,020,000	$0	$510,000	$510,000
East Side Access Road and Utilities	TBD[6]	$1,100,000	$0	$880,000	$220,000
Subtotal Intermediate-Term		**$8,120,000**	**$0**	**$6,190,000**	**$1,930,000**
Long-Term					
Phase 3 Airfield Improvements	2033	$16,700,000	$0	$13,360,000	$3,340,000
Subtotal Long-Term		**$16,700,000**	**$0**	**$13,360,000**	**$3,340,000**
Grand Total		**$52,348,719**	**$9,945,671**	**$32,084,916**	**$10,318,132**

Total CIP:
Costs developed in 2018 U.S. dollars and escalated 3.5% annually for inflation.

CIP Costs By Phase



Potential Funding Breakdown



Legend

Existing CIP (FY 2019-FY 2020)	$6.8 M
Near-Term Projects (FY 2020-FY 2024)	$20.8 M
Intermediate-Term Projects (FY 2025-FY 2029)	$8.1 M
Long-Term Projects (FY 2030-FY 2035)	$16.7 M

Legend

FDOT	$32.1 M
FAA	$9.9 M
Local	$10.3 M

NOTES:
[1] Project funding allocations are based on eligibility criteria. Actual project funding and/or timing is subject to change.
[2] For fiscal years ending September 30.
[3] Amounts shown are escalated dollars (3.5 percent annually from 2018).
[4] Local funds include funding from the Broward County Aviation Department or other local funding agencies.
[5] This project includes advanced planning and professional services, including the development of program definition documents (PDD) and basis of design (BOD) reports, contract document production, and environmental documentation.
[6] The timing of the construction of the East Side Access Road is dependent on tenant facility development needs. For planning purposes, it is assumed that this project would occur in the intermediate-term planning horizon. These dates and costs are subject to change.

SOURCES: American Infrastructure Development, Inc., May 2018 (Master Plan Cost Estimates); Kimley-Horn and Associates, Inc., HWO Airfield Safety Enhancement and Geometry Study, April 2017; Ricondo & Associates, Inc., April 2019.

8 Environmental Overview

The Environmental Overview summarizes environmental processing considerations for the recommended enhancements proposed as part of the HWO MPU. This specifically relates to the requirements in FAA Order 1050.1F, Environmental Impacts: Policies and Procedures, and FAA Order 5050.4B, National Environmental Policy Act (NEPA) Implementing Instructions for Airport Actions. All projects that require a federal action, including receipt of federal funding, must comply with NEPA. In addition to environmental review of MPU projects at the federal level pursuant to NEPA, projects that are funded through FDOT will require preparation of a State Environmental Impact Report.

The intent of an airport master plan environmental overview is to provide an understanding of key environmental issues that would likely need to be addressed as part of future environmental reviews of the MPU projects. The existing environmental conditions were identified and documented as part of the ASEG Study and then considered in the analysis of enhancement alternatives. During the development of the ASEG Study, the FAA was consulted to review the level of NEPA evaluation required for the recommended airfield improvements. Based on feedback from the FAA, BCAD submitted documentation to support categorical exclusion of airfield geometric improvements and safety enhancements.

In August 2017, the FAA determined that the ASEG Study's airfield geometric improvements included in the near- and intermediate- term planning periods were categorically excluded from further NEPA review pursuant to FAA Order 1050.1F, paragraphs 5 6.3.b and 5 6.4.e. These projects, along with other MPU projects that generally align with definitions for actions that are eligible for categorical exclusion as long as no extraordinary circumstances exist as defined in FAA Order 1050.1F, are presented in the table below. The resource categories that would likely require detailed review in future environmental evaluations of HWO MPU projects are also depicted.

Preliminary NEPA Compliance Review for Recommended Airport Enhancements

Master Plan Update Project	Potentially Eligible for Categorical Exclusion[1, 2, 4]	Potential for Project Footprint to Affect Resource
Airfield		
Mitigate Hotspot 1	Categorically Excluded[4]	N/A
Mitigate Hotspot 2	Categorically Excluded[4]	N/A
Mitigate Hotspot 3	Categorically Excluded[4]	N/A
Phase 2 Airfield Improvements	Categorically Excluded[4]	N/A
Airfield Lighting Improvements	Yes (5-6.3.b)	●
Phase 3 Airfield Improvements	Yes (5-6.4.e)	● ● ●
BCAD Support Facilities		
Administrative and Maintenance Facility	Yes (5-6.4.f)	● ● ●
ATC Tower Replacement	No	● ●
Separated Shared-Use Path and Landscaping Along Airport Road	No	● ●
Development Parcels		
Aeronautical Development Parcel – 1B	No	● ● ● ●
Aeronautical Development Parcel – 2	Yes (5-6.4.f)	● ● ● ● ●
Aeronautical Development Parcel – 3	No	● ● ● ● ●
Aeronautical Development Parcel – 7	Yes (5-6.4.e)	● ● ●
Aeronautical Development Parcel – 10	No	● ● ●
Aeronautical Development Parcel – 11	No	● ● ●
Surplus/Demand Driven Development Parcel – 4	No	● ● ● ●
Surplus/Demand Driven Development Parcel – 5	No	● ● ● ●
Surplus/Demand Driven Development Parcel – 6	No	● ● ● ●
Surplus/Demand Driven Development Parcel – 9	No	● ● ● ●
Surplus/Demand Driven Development Parcel – 12	No	● ●
Non-Aeronautical Development Parcel – 8	No	● ● ● ●

Legend

- ● Air Quality
- ● Biological Resources
- ● Cultural Resources
- ● Hazardous Materials, Solid Waste, and Pollution Prevention
- ● Water Resources (Floodplains, Surface Waters, Wetlands, and Groundwater)

NOTES:
[1] No = Not typically eligible for categorical exclusion or insufficient information to confirm potentially applicable categorical exclusion (CATEX) citation.
[2] Citations on Page 28-29 reference paragraphs in U.S. Department of Transportation, Federal Aviation Administration, Order 1050.1F, Environmental Impacts: Policies and Procedures, July 16, 2015 and are depicted on Page 30.
[3] Coordination with the FAA on the level of NEPA review (i.e., categorical exclusion, EA, or EIS) would need to occur for each project or set of connected projects. The FAA would make the final decision on the level of NEPA review.
[4] The FAA categorically excluded the project from further environmental review under the National Environmental Policy Act as part of the Airfield Safety Enhancement and Geometry Study on August 3, 2017.

SOURCES: U.S. Department of Transportation, Federal Aviation Administration, Order *1050.1F, Environmental Impacts: Policies and Procedures*, July 16, 2015; American Infrastructure Development, Inc., April 2019; Ricondo & Associates, Inc., September 2019.

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

FAA Order 1050.1F Policies and Procedures for Considering Environmental Impacts
Applicability of Categorical Exclusion citations is subject to FAA review for the potential for extraordinary circumstances (i.e., factors or circumstances in which a normally categorically excluded action may have a significant environmental impact that requires further analysis in an Environmental Assessment or an Environmental Impact Statement) before finalizing a decision to categorically exclude a proposed action.

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

FAA Order 1050.1F, Paragraph 5-6.4.e

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

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

9 Stakeholder Engagement and Public Outreach

The MPU included input from internal and external stakeholders; the public; and federal, state, and local agencies. Comments and input were solicited through a public workshop, committee briefings, one-on-one meetings, and through the BCAD website. Public outreach and stakeholder engagement briefings during the MPU took place during the following dates:

Summary of Key Stakeholder Meetings

Regular	• **MONTHLY:** Project Coordination with BCAD Development and Planning Staff, Executive Director Briefings
2016 • Visioning • Airports Geographic Information System (AGIS) • Inventory	• **SEPTEMBER:** Policy Advisory Committee & Technical Advisory Committee – Briefing #1
2017 • Forecasts Approved (ASEG Study) • Preliminary Demand Capacity / Facility Requirements • Preliminary Land Use Plan Development	• **OCTOBER:** FAA Briefing
2018 • MPU Sensitivity Analysis Forecast Development • Refined Demand Capacity / Facility Requirements • Preliminary Alternatives • Environmental Overview • Preliminary ALP Development	• **JUNE:** Policy Advisory Committee & Technical Advisory Committee – Briefing #2 • **AUGUST:** Tenant Briefing #1, FAA Briefing
2019 • Refined Alternatives • Program Phasing and Implementation • CIP Development • ALP Submission	• **APRIL:** FDOT Briefing • **MAY:** Policy Advisory Committee & Technical Advisory Committee – Briefing #3, Tenant Briefing #2, Public Open House Workshop

10 Acknowledgments

Broward County Aviation Department (BCAD)

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Policy Advisory Committee (PAC) & Technical Advisory Committee (TAC):

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

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BROWARD COUNTY
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