

Table of Contents

1.	Introduction/Overview	1-1
1.1	Changes Since Last Master Plan	1-1
1.2	Strategic Objectives and Goals	1-2
1.3	Overview of Master Plan Process and Deliverables	1-4
1.3.1	MASTER PLAN PROCESS.....	1-4
1.3.2	MASTER PLAN DELIVERABLES.....	1-5
1.3.3	RELATED STUDIES.....	1-6
1.4	Stakeholder Engagement Strategy and Public Outreach Program.....	1-6
2.	Existing Conditions Inventory.....	2-1
2.1	General Airport Information	2-2
2.1.1	AIRPORT HISTORY	2-2
2.1.2	AIRPORT LOCATION AND SIZE.....	2-2
2.1.3	AIRPORT ACTIVITY DATA.....	2-3
2.1.4	BASED AIRCRAFT	2-4
2.1.5	METEOROLOGICAL CONDITIONS	2-5
2.2	Airfield and Airspace	2-6
2.2.1	AIRFIELD	2-7
2.2.2	AIRSPACE	2-22
2.3	Landside Facilities	2-43
2.3.1	ON-AIRPORT ROADWAYS	2-43
2.3.2	TRAFFIC COUNT DATA COLLECTION	2-44
2.3.3	ON-AIRPORT ROADWAY INTERSECTIONS	2-53
2.3.5	PUBLIC TRANSPORTATION	2-61
2.4	Fixed-Base Operator and General Aviation Facilities	2-61
2.4.1	FIXED-BASE OPERATORS	2-61
2.4.2	OTHER GENERAL AVIATION TENANTS	2-81
2.5	Airport Support Facilities.....	2-103
2.5.1	AIRPORT RESCUE AND FIREFIGHTING STATION	2-103
2.5.2	AIRPORT POLICE AND SECURITY	2-109
2.5.3	AIRPORT ADMINISTRATION AND MAINTENANCE FACILITIES	2-109
2.5.4	FEDERAL AVIATION ADMINISTRATION FACILITIES AND EQUIPMENT.....	2-109



Table of Contents (continued)

2.6	Non-Aeronautical Airport Tenants	2-115
2.7	Airport Utilities.....	2-115
2.7.1	ELECTRIC	2-115
2.7.1	POTABLE WATER.....	2-115
2.7.2	TELEPHONE	2-115
2.7.3	SANITARY SEWER.....	2-115
2.8	On-Airport and Off-Airport Land Uses	2-121
2.8.1	ON-AIRPORT LAND USES.....	2-121
2.8.3	OFF-AIRPORT LAND USES	2-125
2.9	Environmental Conditions	2-125
2.10	Sustainable Programs and Policies.....	2-125
3.	Aviation Activity Forecasts	3-1
3.1	Forecasting Approach	3-1
3.2	Summary of Results.....	3-2
3.2.1	BASED AIRCRAFT FORECASTS	3-2
3.2.2	AIRCRAFT OPERATIONS FORECASTS	3-4
4.	Demand Capacity Analysis and Facility Requirements	4-1
4.1	General Overview	4-1
4.1.1	MPU SENSITIVITY ANALYSIS FORECAST.....	4-2
4.2	Airfield Requirements	4-3
4.2.1	AIRFIELD CAPACITY.....	4-3
4.2.2	RUNWAY ANALYSIS.....	4-5
4.2.3	TAXIWAY ANALYSIS.....	4-12
4.2.4	LIGHTING, MARKING, AND NAVAIDS	4-13
4.2.5	HELIPAD	4-14
4.2.6	SUMMARY OF AIRFIELD REQUIREMENTS	4-14
4.3	General Aviation / Fixed-Base Operator Facilities.....	4-15
4.3.1	AIRCRAFT PARKING	4-15
4.3.2	AIRCRAFT HANGARS.....	4-17
4.3.3	FIXED-BASE OPERATOR / TERMINAL FACILITIES	4-19
4.3.4	VEHICLE PARKING REQUIREMENTS	4-22



Table of Contents (continued)

4.4	Support Facilities	4-23
4.4.1	AIR TRAFFIC CONTROL TOWER.....	4-23
4.4.2	CITY OF PEMBROKE PINES FIRE STATION	4-24
4.4.3	BCAD AIRPORT ADMINISTRATION AND MAINTENANCE FACILITIES.....	4-24
4.4.4	AIRCRAFT FUEL STORAGE.....	4-24
4.4.5	AIRPORT POLICE AND SECURITY	4-25
4.4.6	UTILITIES	4-25
4.5	Airport Facility Requirements Summary.....	4-26
4.5.1	AIRFIELD IMPROVEMENTS.....	4-26
4.5.2	GENERAL AVIATION AND SUPPORT FACILITIES.....	4-26
5.	Alternatives Definition and Evaluation.....	5-1
5.1	Planning Considerations	5-2
5.1.1	GOALS AND OBJECTIVES.....	5-2
5.1.2	APPROACH AND METHODOLOGY.....	5-3
5.2	Airfield Enhancements	5-3
5.2.1	ELIMINATED ASEG RECOMMENDATIONS.....	5-5
5.2.2	HOT SPOT REMEDIATION	5-5
5.2.3	OTHER RUNWAY INCURSION MITIGATION MEASURES.....	5-13
5.2.4	OTHER AIRFIELD DESIGN STANDARDS COMPLIANCE INITIATIVES.....	5-17
5.2.5	OTHER AIRFIELD ENHANCEMENTS	5-17
5.2.6	ELIMINATION OF HELIPAD DEVELOPMENT FROM PRIOR MASTER PLAN.....	5-18
5.2.7	RECOMMENDED AIRFIELD ENHANCEMENTS COSTS.....	5-23
5.3	General Aviation / Fixed-Base Operator Development Alternatives.....	5-23
5.3.1	LAND USE CONSIDERATIONS.....	5-23
5.3.2	TENANT PLANNED DEVELOPMENT.....	5-39
5.3.3	AIRCRAFT STORAGE AND PARKING DEVELOPMENT ALTERNATIVES.....	5-47
5.4	Aviation Support Facility Alternatives.....	5-47
5.4.1	AIR TRAFFIC CONTROL TOWER	5-48
5.4.2	BCAD AIRPORT ADMINISTRATION AND MAINTENANCE FACILTIES	5-53
5.4.3	ELECTRICAL VAULT REPLACEMENT	5-59



Table of Contents (continued)

5.5	Landside Alternatives.....	5-63
	5.5.1 EAST SIDE LANDSIDE ACCESS.....	5-63
	5.5.2 AIRPORT ROAD REALIGNMENT.....	5-64
	5.5.3 SEPARATED SHARED-USE PATH (BIKE PATH).....	5-64
5.6	Airport Development Plan	5-73
6.	Environmental Overview	6-1
	6.1 Introduction.....	6-1
	6.2 Environmental Considerations – Master Plan Update Projects	6-7
	6.2.1 AIR QUALITY	6-15
	6.2.2 BIOLOGICAL RESOURCES.....	6-15
	6.2.3 DEPARTMENT OF TRANSPORTATION ACT, SECTION 4(F).....	6-16
	6.2.4 HAZARDOUS MATERIALS, SOLID WASTE, AND POLLUTION PREVENTION	6-17
	6.2.5 HISTORICAL, ARCHITECTURAL, ARCHAEOLOGICAL, AND CULTURAL RESOURCES	6-17
	6.2.6 NOISE AND COMPATIBLE LAND USE	6-17
	6.2.7 WATER RESOURCES	6-18
	6.3 Environmental Strategy.....	6-19
	6.3.1 MASTER PLAN UPDATE PROJECTS WITH ENVIRONMENTAL CLEARANCE	6-19
	6.3.2 NATIONAL ENVIRONMENTAL POLICY ACT REQUIREMENTS FOR MASTER PLAN UPDATE PROJECTS	6-19
	6.3.3 STATE ENVIRONMENTAL REQUIREMENTS FOR MASTER PLAN UPDATE PROJECTS.....	6-20
	6.3.4 LOCAL ENVIRONMENTAL REQUIREMENTS FOR MASTER PLAN UPDATE PROJECTS	6-20
	6.4 Recycling, Reuse, and Waste Reduction Plan.....	6-22
	6.4.1 BACKGROUND	6-22
	6.4.2 PLAN TO MINIMIZE SOLID WASTE	6-23
7.	Capital Improvement Program Implementation Plan.....	7-1
	7.1 Introduction.....	7-1
	7.2 Potential Funding Sources	7-2
	7.2.1 FEDERAL AVIATION ADMINISTRATION	7-2
	7.2.2 FLORIDA DEPARTMENT OF TRANSPORTATION	7-3
	7.2.3 LOCAL FUNDING	7-4



Table of Contents (continued)

7.3	Project Sequencing	7-4
	7.3.1 NEAR-TERM PROJECTS	7-5
	7.3.2 INTERMEDIATE-TERM PROJECTS.....	7-10
	7.3.3 LONG-TERM PROJECTS	7-13
7.4	Project Timing Considerations	7-13
7.5	Rough Order of Magnitude Costs	7-19
7.6	Capital Improvement Program	7-20
8.	Airport Layout Plan Drawing Set	8-1
8.1	Cover Sheet.....	8-2
8.2	Airport Data Sheet.....	8-2
8.3	Existing Airport Layout Plan.....	8-4
8.4	Future Airport Layout Plan	8-5
8.5	Airport Airspace Plans and Runway Profiles.....	8-5
8.6	Runway Centerline Profiles	8-7
8.7	Runway Inner Approach Surfaces	8-8
8.8	Departure Surfaces.....	8-9
8.9	On-Airport Land Use Plan	8-9
8.10	Off-Airport Land Use Plan.....	8-10
8.11	Airport Property Map	8-10

List of Appendices

- Appendix A: Stakeholder Engagement and Public Outreach Program
- Appendix B: Airfield Safety Enhancement and Geometry Study - Environmental Inventory
- Appendix C: Airfield Safety Enhancement and Geometry Study - Forecasts and FAA Approval Letter
- Appendix D: Wind Analysis Weather Data
- Appendix E: Airfield Safety Enhancement and Geometry Study - Runway and Taxiway Analysis
- Appendix F: Preliminary Conceptual Hangar and Apron Layouts
- Appendix G: Capital Improvement Program Project Sheets
- Appendix H: Airport Layout Plan Review Checklist
- Appendix I: Aeronautical Market Assessment

List of Tables

Table 2.1-1: Annual Aircraft Operations (December 2014 through November 2015).....	2-4
Table 2.1-2: Based Aircraft at the Airport (2016).....	2-5
Table 2.1-3: HWO Wind Coverage.....	2-6
Table 2.2-1: Runway Design Codes	2-13
Table 2.2-2: Runway Characteristics.....	2-14
Table 2.2-3: Approach and Departure Reference Codes	2-14
Table 2.2-4: Taxiway Characteristics	2-15
Table 2.2-5: Airport Navigational Aids	2-21
Table 2.2-6: Airfield Capacity Estimates: Previous Airfield Capacity Studies.....	2-21
Table 2.2-7: Runway Use Configurations	2-25
Table 2.2-8: Current Instrument Approach and Standard Arrival and Departure Procedures.....	2-26
Table 2.2-9: Airspace Obstructions—Runway 1L-19R	2-27
Table 2.2-10: Airspace Obstructions—Runway 1R-19L	2-28
Table 2.2-11: Airspace Obstructions—Runway 10L-28R.....	2-30
Table 2.2-12: Airspace Obstructions—Runway 10R-28L.....	2-32
Table 2.3-1: Traffic Count Information for Pines Boulevard, University Drive, and Pembroke Road.....	2-49
Table 2.3-2: 7-Day Counts Summary at SW 77th Way by Hour (Vehicles per Hour)	2-50
Table 2.3-3: 24-Hour Classification Counts Summary	2-51
Table 2.3-4: Turning Movement Counts at N. Airport Road and SW 77th Way	2-52
Table 2.3-5: Turning Movement Counts at W. Airport Road and Senator Howard C Forman Road	2-52
Table 2.3-6: Turning Movement Counts at Island Drive and S. Airport Road	2-53
Table 2.4-1: Fixed-Base Operator Facility Inventory	2-79
Table 2.4-2: Fixed-Base Operator Aircraft Parking and Storage	2-80
Table 2.4-3: FBO Fuel Storage Capabilities	2-80
Table 2.4-4: FBO Automobile Parking Positions	2-81
Table 2.4-5: Aircraft Storage Facilities	2-103
Table 2.8-1: On-Airport Land Uses.....	2-121
Table 3.2-1: HWO Historical and Forecast Based Aircraft.....	3-3
Table 3.2-2: HWO Historical and Forecast Aircraft Operations.....	3-4
Table 4.1-1: Operations and Based Aircraft Demand Projections	4-3
Table 4.2-2: Annual Service Volume Weighted Hourly Capacity.....	4-4
Table 4.2-3: Allowable Crosswind Components Per Runway Design Code	4-6
Table 4.2-4: North Perry Airport Wind Coverage.....	4-7
Table 4.2-5: Runway Separation Standards Compared	4-12
Table 4.3-1: Aircraft Hangar Requirements ^{1/}	4-18
Table 4.3-2: Fixed-Base Operator Terminal Space (Square Feet)	4-19

List of Tables (continued)

Table 4.3-3: Peak Month and Peak Day Forecast	4-20
Table 4.3-4: Peak Operations Forecast.....	4-20
Table 4.3-5: Fixed-Base Operator Terminal Space Requirements	4-21
Table 4.3-6: Vehicle Parking Demand (sq. ft.)	4-22
Table 4.3-7: City of Pembroke Pines Parking Requirements Based Upon Proposed Tenant Development	4-23
Table 4.4-1: Fuel Storage Requirements	4-25
Table 4.5-1: General Aviation Facility Requirements Summary ^{1/}	4-27
Table 4.5-2: General Aviation Facility Deficiency Summary ^{1/}	4-28
Table 4.5-3: Aviation Support Facility Requirements ^{1/}	4-29
Table 5.2-1: Validation of Airfield Safety Enhancement and Geometry Study Recommendations	5-4
Table 5.2-2: Helipad Development Alternative Rough Order of Magnitude Cost	5-18
Table 5.2-3: Recommended Airfield Enhancements Rough Order of Magnitude Cost.....	5-24
Table 5.3-1: Land Use Option Comparison (Acres).....	5-39
Table 5.3-2: Tenant Expansion Net Increase (Square Feet)	5-47
Table 5.4-1: Air Traffic Control Tower Rough Order of Magnitude Cost	5-48
Table 5.4-2: BCAD Administration and Maintenance Building Rough Order of Magnitude Cost.....	5-59
Table 5.4-3: Electrical Vault Replacement Rough Order of Magnitude Cost	5-59
Table 5.5-1: Separated Shared-Use Path (Bike Path) Rough Order of Magnitude Cost.....	5-69
Table 5.6-1: Airport Development Plan Rough Order of Magnitude Cost.....	5-73
Table 5.6-1: Airport Development Plan Rough Order of Magnitude Cost.....	5-71
Table 6.2-1: Potential Environmental Issues Associated with Master Plan Update Projects	6-8
Table 6.2-2: Broward County Endangered and Threatened Species.....	6-15
Table 6.3-1: Identification of Projects Potentially Eligible for Categorical Exclusion	6-21
Table 6.4-1: Plan to Minimize Solid Waste	6-24
Table 7.5-1: Capital Improvement Program Rough Order of Magnitude Costs (2018 Dollars)	7-21
Table 7.6-1: Capital Improvement Program Funding Sources.....	7-22
Table 8.5-1: North Perry Airport – 14 CFR Part 77 Imaginary Surfaces by Runway End	8-7
Table 8.6-1: North Perry Airport – Summary of Runway Elevations	8-8



List of Exhibits

Exhibit 1.2-1: Airport Master Plan Goals and Objectives.....	1-3
Exhibit 1.3-1: Airport Master Plan Process	1-4
Exhibit 1.4-1: Airport Master Plan Stakeholder Involvement	1-8
Exhibit 2.1-1: Airport Environs	2-3
Exhibit 2.2-2: Airfield Layout	2-8
Exhibit 2.2-3: Airfield Safety Enhancement and Geometry Study Proposed Airfield Improvements	2-9
Exhibit 2.2-4: Airfield Safety Enhancement and Geometry Study Master Plan Baseline Conditions	2-11
Exhibit 2.2-5: Taxiway Pavement Condition	2-17
Exhibit 2.2-6: Movement and Non-movement Areas.....	2-19
Exhibit 2.2-7: Runway Use Configurations	2-23
Exhibit 2.2-8: Airspace Obstructions - Runway 1L-19R	2-35
Exhibit 2.2-9: Airspace Obstructions - Runway 1R-19L.....	2-37
Exhibit 2.2-10: Airspace Obstructions - Runway 10L-28R	2-39
Exhibit 2.2-11: Airspace Obstructions - Runway 10R-28L	2-41
Exhibit 2.3-1: Existing On-Airport Roadway System	2-45
Exhibit 2.3-2: Roadway Traffic Count Locations at HWO.....	2-47
Exhibit 2.3-3: W. Airport Road and SW 77th Way (North Entry to the Airport)	2-55
Exhibit 2.3-4: W. Airport Road and Senator Howard C Forman Road (West Entry to the Airport)	2-57
Exhibit 2.3-5: S. Airport Road and Island Drive (South Entry to the Airport)	2-59
Exhibit 2.3-6: Public Transportation Systems Serving HWO	2-63
Exhibit 2.4-1: Fixed-Base Operator and General Aviation Facilities	2-65
Exhibit 2.4-2: North Perry Central Facilities	2-69
Exhibit 2.4-3: Hollywood Aviation Facilities.....	2-71
Exhibit 2.4-4: Bobby's Landing Facilities.....	2-75
Exhibit 2.4-5: Pelican Flight Training Facilities	2-77
Exhibit 2.4-6: Wayman Flight Training Facilities	2-83
Exhibit 2.4-7: Broward County Mosquito Control Facilities	2-87
Exhibit 2.4-8: Van Wagner Aerial Media Facilities	2-89
Exhibit 2.4-9: Helicopters, Inc. Facilities	2-91
Exhibit 2.4-10: Diversified Aviation NP Facilities	2-95
Exhibit 2.4-11: North Perry Aerospace CCO, LLC Facilities	2-97
Exhibit 2.4-12: North Perry Aviation, Inc. Facilities.....	2-99
Exhibit 2.4-13: Broward County Apron	2-101
Exhibit 2.5-1: Airport Support Facilities.....	2-105
Exhibit 2.5-2: Aircraft Rescue and Firefighting Station	2-107
Exhibit 2.5-3: Airport Administration and Maintenance Facilities	2-111



List of Exhibits (continued)

Exhibit 2.5-4: Federal Aviation Administration Facilities and Equipment	2-113
Exhibit 2.6-1: Non-Aeronautical Tenants and Facilities.....	2-117
Exhibit 2.7-1: Existing On-Airport Utilities Infrastructure	2-119
Exhibit 2.8-1: On-Airport Land Use.....	2-123
Exhibit 2.8-2: Off-Airport Land Use	2-127
Exhibit 3.2-1: Based Aircraft Forecast.....	3-3
Exhibit 3.2-2: Aircraft Operations Forecast.....	3-5
Exhibit 4.2-1: All Weather – Windrose.....	4-8
Exhibit 4.2-2: Visual Flight Rules – Windrose	4-9
Exhibit 4.2-3: Instrument Flight Rules – Windrose	4-10
Exhibit 4.2-4: Taxiway Geometry Concerns.....	4-13
Exhibit 4.3-1: Existing North Apron Area	4-16
Exhibit 4.3-2: Existing South Apron Area (Western Portion).....	4-16
Exhibit 4.3-3: Existing South Apron Area (Eastern Portion).....	4-17
Exhibit 5.2-1: Airfield Safety Enhancement and Geometry Study Recommendations Not Carried Forward	5-7
Exhibit 5.2-2: Hot Spot Remediation	5-11
Exhibit 5.2-3: Other Airfield Enhancements (Non-Hot Spot Mitigation).....	5-15
Exhibit 5.2-4: Potential Areas for Helipad Sites.....	5-19
Exhibit 5.2-5: Potential Helipad Development Concept	5-21
Exhibit 5.3-1: Potential Development Areas	5-27
Exhibit 5.3-2: Potential Future Land Use Plan – Option 1A	5-31
Exhibit 5.3-3: Potential Future Land Use Plan – Option 1B	5-33
Exhibit 5.3-4: Potential Future Land Use Plan – Option 2A	5-35
Exhibit 5.3-5: Potential Future Land Use Plan – Option 2B	5-37
Exhibit 5.3-6: Preferred Future Land Use Plan	5-41
Exhibit 5.3-7: Proposed Expansion and Redevelopment Plan - Bobby's Landing Leasehold	5-43
Exhibit 5.3-8: Proposed Facility Expansion – Wayman Aviation Leasehold	5-45
Exhibit 5.4-1: Proposed Air Traffic Control Tower Location.....	5-49
Exhibit 5.4-2: Air Traffic Control Tower Line-of-Sight	5-51
Exhibit 5.4-3: Alternative 1 – Construct Supplemental Building	5-55
Exhibit 5.4-4: Alternative 2 – Construct Enlarged Replacement BCAD Maintenance Building	5-57
Exhibit 5.4-5: Electrical Vault Relocation	5-61
Exhibit 5.5-1: East Side Access Road – Airport Road Extension.....	5-65
Exhibit 5.5-2: Previously Proposed Airport Road Realignment (Not Recommended).....	5-67
Exhibit 5.5-3: Separated Shared-Use Path (Bike Path)	5-71
Exhibit 5.6-1: Airport Development Plan	5-75



List of Exhibits (continued)

Exhibit 5.6-2: Master Plan Update Conceptual Rendering.....	5-77
Exhibit 5.6-3: Representative Shared-Use Path Rendering	5-79
Exhibit 6.1-1: Proposed 20-Year Development Plan Projects.....	6-3
Exhibit 6.1-2: Preferred Land Use Plan	6-5
Exhibit 6.2-1: Environmental Considerations.....	6-13
Exhibit 7.3-1: Near-Term Projects.....	7-7
Exhibit 7.3-2: Intermediate-Term Projects	7-11
Exhibit 7.3-3: Long-Term Projects.....	7-14