

# GUIDEBOOK FOR AIRPORT MASTER PLANNING



2019 - 2020



FDOT Aviation Office

## PREFACE

<b>GUIDEBOOK OVERVIEW</b> .....	<b>2</b>
What’s New.....	2
Purpose of the Guidebook .....	2
The Florida Philosophy of Airport Master Planning.....	2
Guidebook Structure and Use .....	2

## PART 1 – MASTER PLANS: SETTING THE STAGE AIRPORT MASTER PLANS

<b>AIRPORT MASTER PLANS</b> .....	<b>3</b>
Introduction.....	3
Setting the Stage .....	3
Airport Master Plans.....	3
FAA Coordination.....	3
FDOT Coordination .....	3
<b>Types of Airport Master Plans</b> .....	<b>3</b>
Master Plans .....	3
Airport Layout Plan Updates.....	4
<b>Products of an Airport Master Plan</b> .....	<b>4</b>
Master Plan Document .....	4
Airport Layout Plan Drawing Set .....	4
Capital Improvement Plan .....	4
Final Deliverables.....	5
<b>Standardization of Products</b> .....	<b>5</b>
<b>Relationship to Funding</b> .....	<b>5</b>
<b>Relationship to Other Planning Efforts</b> .....	<b>5</b>
Strategic Plans.....	5
Business Plans .....	5
Marketing Plans/Analysis .....	5
Compatible Land-Use Plans .....	5
Sustainability Plans.....	5
Asset Management .....	5
Financial Plans.....	5
Terminal Area Plans.....	5
System Plans.....	5
Additional Planning Efforts .....	5

## STATE/FEDERAL GUIDELINES AND REGULATORY REQUIREMENTS

Federal Master Plan Guidance .....	6
State/FDOT Guidelines and Guidance .....	7
Additional FAA Guidance and Regulation.....	7
Security Guidance and Regulation .....	7

## PART 2 – MASTER PLANS: DEVELOPING THE VISION

### SCOPE DEVELOPMENT

Introduction.....	9
Using this Chapter.....	9
<b>Initial Needs Determination</b> .....	<b>10</b>
Introduction.....	10
Items to Address in the Scope .....	10
Determining the Appropriate Type of Study.....	10
<b>Pre-Planning</b> .....	<b>10</b>
Introduction.....	10
Purpose of the Project .....	10
Desired Outcome .....	11
Goals and Objectives.....	11
Budget .....	11
<b>Application for Federal and State Funding</b> .....	<b>11</b>

Funding Process and Timeline .....	11
FAA Funding .....	11
FDOT Funding .....	11
<b>Consultant Selection</b> .....	<b>12</b>
<b>Scoping Process</b> .....	<b>12</b>
Introduction.....	12
Request for Qualifications/Proposals .....	12
Airport Considerations.....	12
Project Considerations .....	12
Grant Assurances .....	12
Stakeholder and Public Involvement.....	13
Existing Conditions and Data Availability .....	14
Forecasts.....	14
Environmental Conditions.....	14
Airport Layout Plans.....	14
Schedules .....	15
Deliverables.....	15
Summary.....	15

## PART 3 – MASTER PLANS: PRODUCT DEVELOPMENT

<b>SECTION 1: OVERVIEW OF TRADITIONAL MASTER PLAN WORK ELEMENTS</b> .....	<b>17</b>
<b>Master Plan Work Elements</b> .....	<b>17</b>
Public Involvement Program (PIP).....	17
Environmental Considerations .....	17
Existing Conditions .....	17
Aviation Activity Forecasts .....	17
Facility Requirements.....	17
Development and Evaluation of Alternatives .....	17
Airport Layout Plans.....	17
Facilities Implementation Plan.....	17
Financial Feasibility Analysis .....	17
Final Documentation .....	17
<b>SECTION 2: STAKEHOLDER &amp; PUBLIC INVOLVEMENT PROGRAM</b> .....	<b>18</b>
<b>Purpose</b> .....	<b>18</b>
<b>PIP Requirements</b> .....	<b>18</b>
Grant Assurances .....	18
Florida Sunshine Law.....	18
<b>Types of Public Involvement</b> .....	<b>18</b>
<b>PIP Timing</b> .....	<b>18</b>
<b>Stakeholder Identification</b> .....	<b>19</b>
Role and Purpose of Stakeholder and Public Involvement.....	19
<b>Methods and Techniques for Stakeholder and Public Involvement</b> .....	<b>19</b>
Committees.....	19
Public Information Meetings .....	19
Meeting Organization.....	20
<b>Tools for PIP Communication</b> .....	<b>20</b>
Communication Methods .....	20
Distribution of Information .....	20
Challenges of Communication.....	20
Documentation of PIP in Master Plan.....	20
PIP.....	20

<b>SECTION 3: ENVIRONMENTAL CONSIDERATIONS</b> .....	<b>21</b>
<b>Federal and State Environmental Processes</b> .....	<b>22</b>
FAA Guidance.....	22
NEPA Process.....	22
State Guidance.....	23
State Environmental Requirements for Non-NPIAS Airports .....	23
Federal and State Statutory Requirements.....	23

<b>Additional Considerations</b> .....	<b>23</b>
Project Identification.....	23
Permits .....	23
<b>Emerging Trends in Environmental Considerations</b> .....	<b>24</b>
Sustainability.....	24
Recycling .....	24
Wildlife Management .....	24
<b>Environmental Documentation in a Master Plan</b> .....	<b>24</b>
<b>SECTION 4: EXISTING CONDITIONS</b> .....	<b>25</b>
<b>Airport Background</b> .....	<b>25</b>
<b>Inventory and Description of Existing Facilities</b> .....	<b>25</b>
Airfield and Airspace.....	25
Weather Conditions.....	25
Commercial Passenger Terminal Facilities.....	25
General Aviation Facilities.....	25
Air Cargo Facilities .....	26
Support Facilities .....	26
Access, Circulation, and Auto Parking.....	26
Utilities .....	26
Other.....	26
<b>Regional Setting and Land Use</b> .....	<b>27</b>
<b>Environmental Overview</b> .....	<b>27</b>
<b>Socioeconomic Data</b> .....	<b>27</b>
<b>Historical Aviation Activity</b> .....	<b>27</b>
<b>Airport Financial Data</b> .....	<b>28</b>
<b>Compliance and Other Considerations</b> .....	<b>28</b>
Compliance.....	28
Documentation Guidelines.....	28
<b>SECTION 5: AVIATION FORECASTS</b> .....	<b>29</b>
<b>Forecast Purpose</b> .....	<b>29</b>
<b>Steps in the Forecast Process and Approvals</b> .....	<b>29</b>
Review Previous Airport Forecasts.....	29
Identify Aviation Forecast Indicators.....	29
Collect Data .....	30
Select Forecast Methods .....	30
Apply Forecast Methods and Evaluate Results.....	30
Compare Forecast Results with the FAA’s Terminal Area Forecasts .....	30
Coordinate with Agencies to Approve Forecasts.....	30
<b>Forecast Elements and Data Resources</b> .....	<b>30</b>
Passenger Enplanements .....	33
Peak Period Forecasts .....	33
Automobile Traffic (Landside Transportation) .....	33
Air Cargo .....	34
Airport Master Plan Forecast Elements and Resources – Summary.....	34
<b>Forecast Methodologies</b> .....	<b>34</b>
Regression Analysis .....	34
Linear Trend or Trend Line Analysis.....	34
Share Analysis .....	34
Exponential Smoothing.....	34
Comparison with Other Airports.....	34
Survey Techniques .....	34
Cohort Analysis.....	35
Choice and Distribution Models .....	35
<b>Specific Forecasts and Documentation Examples</b> .....	<b>35</b>
Based Aircraft Forecast.....	35
Aircraft Operations Forecast.....	36
Passenger Enplanement Forecast .....	36
Peaking Characteristics Forecast .....	36
Air Cargo Forecast .....	37



<b>SECTION 6: FACILITY REQUIREMENTS</b> .....	<b>38</b>	<b>SECTION 9: FACILITIES IMPLEMENTATION PLAN</b> .....	<b>55</b>	Figure 26. Sample Inner Approach Surface Profile .....	52
Emerging Trends .....	38	Project Attributes .....	55	Figure 27. FAA ALP Submittal and Review Process .....	53
Sustainability .....	38	Scheduling .....	56	Figure 28. Facilities Implementation Plan .....	55
NextGen .....	38	Documentation .....	56	Figure 29. Financial Feasibility Analysis .....	59
Personal Use of Technology .....	39	Joint Automated Capital Improvement Program .....	58		
Economics .....	39	<b>SECTION 10: FINANCIAL FEASIBILITY ANALYSIS</b> .....	<b>59</b>	<b>LIST OF TABLES</b>	
Emergency Planning .....	39	Funding Sources .....	59	Table 1. FAA Airport Master Plan Guidance for Federally Obligated Airports .....	6
Regional Access/Multi-Modal .....	39	Federal .....	59	Table 2. FDOT/State of Florida Airport Master Plan Guidance .....	7
Unmanned Aircraft Systems .....	39	State .....	60	Table 3. Additional FAA Airport Master Plan Guidance for Federally Obligated Airports .....	7
<b>Airport Facility Planning</b> .....	<b>39</b>	Metropolitan Planning Organization (MPO) .....	60	Table 4. Security Guidance and Regulations for Airport Master Planning .....	7
Airfield Capacity .....	39	Local .....	61	Table 5. Airport Master Plan and ALP Elements .....	10
Airport Design Standards .....	39	Private .....	61	Table 6. Environmental Categories .....	22
Runway Analysis .....	40	<b>Financial Feasibility Analysis</b> .....	<b>61</b>	Table 7. Runway Geometry .....	26
Pavement Strength .....	42	Airport Sponsor Financial Structure .....	61	Table 8. Land Use Information .....	27
Pavement Maintenance .....	42	Components of Analysis .....	61	Table 9. Historical Based Aircraft .....	28
Taxiway System .....	43	Pro Forma Cash Flow Analysis .....	61	Table 10. Aviation Demand Indicators .....	29
Instrument Approaches .....	43	Sensitivity Analysis .....	62	Table 11. Summary of Based Aircraft Forecasting Methods for Leesburg International Airport .....	35
Heliports .....	43	Benefit/Cost Analysis .....	62	Table 12. Aircraft Operations Forecast for Okeechobee County Airport .....	36
Airspace and Obstructions .....	44	Return on Invest (ROI) and Internal Rate of Return (IRR) .....	62	Table 13. Peak Operations for DeFuniak Springs Airport .....	36
<b>General Aviation Facility Planning</b> .....	<b>45</b>	<b>Documentation</b> .....	<b>62</b>	Table 14. Air Cargo Forecast for Tampa International Airport (in tons) .....	37
<b>Commercial Airport Facility Planning</b> .....	<b>46</b>	<b>APPENDICES</b> .....	<b>63</b>	Table 15. Runway Design Codes .....	39
<b>Other Potential Topics</b> .....	<b>47</b>	Appendix 1: Documents Referenced in this Guidebook .....	63	Table 16. Licensed Airports Minimum Landing Area Dimensions .....	41
Air Traffic Control Tower (ATCT) .....	47	Appendix 2: Relationship to Other Planning Efforts .....	65	Table 17. Licensed Airports – Landing and Surface Areas .....	41
Air Cargo .....	47	Appendix 3: State, Federal, and Regulatory Requirements and Guidelines .....	67	Table 18. Pavement Condition Index .....	42
Maintenance and Rehabilitation of Facilities .....	47	Appendix 4: Airport Sponsor Checklist .....	71	Table 19. Licensed Airports – Landing and Surface Areas .....	44
Surplus Property .....	47	Appendix 5: Airport Inventory and Data Survey .....	73	Table 20. Part 77 Surface Dimensions .....	44
Utilities .....	47	Appendix 6: Emerging Trends .....	77	Table 21. Primary Element Topics .....	49
Space Travel .....	47	Appendix 7: Other Potential Topics .....	78	Table 22. Safety Critical Projects – Activities that Must Immediately Comply at All Airports .....	51
Americans with Disabilities Act (ADA) Compliance .....	47	Appendix 8: Acronyms .....	79	Table 23. Example of a Project Attribute Sheet .....	55
Through-the-Fence (TTF) Operations .....	47			Table 24. Basic CIP Example .....	57
Energy .....	47			Table 25. Robust CIP Example .....	58
Cyber Security .....	47				
Safety Management System (SMS) .....	47				
Snow Removal Equipment and Deicing .....	47				
<b>Documentation</b> .....	<b>47</b>				
<b>SECTION 7: ALTERNATIVES DEVELOPMENT</b> .....	<b>48</b>	<b>LIST OF FIGURES</b>			
<b>Analysis Process</b> .....	<b>48</b>	Figure 1. Florida Airports Planning Process Flowchart .....	3		
Step 1 – Determine Primary and Secondary Elements .....	48	Figure 2. Scope Development Process Flowchart .....	9		
Step 2 – Identify Preliminary Primary Element Alternatives .....	48	Figure 3. Pre-Planning Effort .....	10		
Steps 3 & 4 – Screen Alternatives for Intermediate List of Primary Element Alternatives .....	48	Figure 4. FAA Project Funding Schedule .....	11		
Steps 5 & 6 – Quantitative Analysis for Short List of Primary Element Alternatives .....	48	Figure 5. Airport Master Planning Process .....	17		
Steps 7 & 8 – Combine and Analyze Primary Element Alternatives .....	48	Figure 6. Environmental Overview .....	21		
Step 9 – Select Preferred Primary Element Alternative .....	48	Figure 7. The NEPA Process .....	22		
Step 10 – Identify Alternatives for the Secondary Elements .....	48	Figure 8. Non-Federal Environmental Process .....	23		
Steps 11 & 12 – Evaluate and Select Recommended Alternatives for Secondary Elements .....	48	Figure 9. Existing Conditions Overview .....	25		
Step 13 – Prepare Refined Recommended Alternative .....	48	Figure 10. Aviation Forecast Overview .....	29		
<b>Identifying Alternatives</b> .....	<b>48</b>	Figure 11. Based Aircraft Resources .....	31		
<b>Evaluating Alternatives</b> .....	<b>49</b>	Figure 12. Sample Operational Fleet Mix Graphic .....	32		
<b>Selecting Recommended Alternative</b> .....	<b>50</b>	Figure 13. Passenger Enplanement Forecast for Jacksonville International Airport .....	36		
<b>Documentation</b> .....	<b>50</b>	Figure 14. Facility Requirements Overview .....	38		
<b>SECTION 8: AIRPORT LAYOUT PLANS</b> .....	<b>51</b>	Figure 15. Aircraft Dimension .....	40		
Computer-Aided Drafting and Design (CADD) Standards .....	51	Figure 16. Taxiway Design Group Measurements .....	40		
Airports GIS (AGIS) .....	51	Figure 17. Key Design Elements .....	40		
Narrative Report .....	51	Figure 18. SAMPLE WIND Rose .....	41		
ALP Drawing Set .....	51	Figure 19. Visual Representation of PCI Ratings from the SAPMP Update .....	42		
ALP .....	52	Figure 20. FAA Defined Safety Areas and Imaginary Surfaces .....	45		
ALP Submittal and Approval Process .....	53	Figure 21. Three-Dimensional Part 77 Surfaces .....	45		
Updates to the ALP .....	54	Figure 22. Nested T-hangar Design .....	45		
		Figure 23. Alternatives Analysis Process Example .....	48		
		Figure 24. Airport Layout Plan Process .....	51		
		Figure 25. Sample Inner Approach Surface Profile .....	52		

## CHANGE LOG FOR THE 2019–2020 GUIDEBOOK FOR AIRPORT MASTER PLANNING

The following items represent material changes from the 2018 Guidebook for Airport Master Planning:

No.	Description of Material Changes	Location in Document	Rationale	Date of Change	No.	Description of Material Changes	Location in Document	Rationale	Date of Change
1	Added reference to ARP Standard Operating Procedure 11.00 Consultant Fee Analysis	Page 7, Table 3	Clarification on Master Plan scoping process	11/13/19	12	Added clarification that critical aircraft criteria (i.e. > 500 annual operations) exclude touch-and-go operations	Page 32, 3 <sup>rd</sup> column	Clarification of forecasting procedure	11/13/19
2	Added reference to TSA Security Guidelines for General Aviation Airport Operators and Users.	Page 7, Table 4	Clarification on airport security guidance	11/13/19	13	Added ACRP references for daily/hourly peak period activity and for planning terminal facilities.	Page 33, 3 <sup>rd</sup> column	Clarification of forecasting procedure	11/13/19
3	Added language on Independent FEE Estimate (IFE) requirement for federally funded master plan projects.	Page 12, 2 <sup>nd</sup> column	Clarification of contracting requirements	11/13/19	14	Added ACRP reference for planning air cargo facilities	Page 34, 1 <sup>st</sup> column	Clarification of information	11/13/19
4	Added reference to identifying critical aircraft as an important forecasting task.	Page 14, 2 <sup>nd</sup> column	Clarification of forecasting process	11/13/19	15	Updated FAA Aerospace Forecasts to latest version	Page 35, 2 <sup>nd</sup> column	Updated data	11/13/19
5	Added clarification for submitting Airport Layout Plans through the FAA OE/AAA website	Page 14, 3 <sup>rd</sup> column	Modification of policy	11/13/19	16	Added ACRP reference for planning and incorporating NextGen capabilities	Page 39, 1 <sup>st</sup> column	Clarification of NextGen guidance	11/13/19
6	Added new resources for incorporating sustainability and recycling programs into airport master plans	Page 24, 2 <sup>nd</sup> column	Clarification of information	11/13/19	17	Added ACRP reference for addressing Unmanned Aircraft Systems (UAS) at airports	Page 39, 2 <sup>nd</sup> column	Clarification of UAS guidance	11/13/19
7	Updated Florida airport classification info per FAA's 2019–2023 NPIAS Report	Page 25, 2 <sup>nd</sup> column	Updated data	11/13/19	18	Updated NOAA resources for obtaining wind data and wind analysis tools	Page 41, 1 <sup>st</sup> column	Updated data	11/13/19
8	Identified inconsistencies exist between 2016 amendment to Chapter 333, F.S. and FDOT Airport Compatible Land Use Guidebook	Page 27, 2 <sup>nd</sup> column	Updated data	11/13/19	19	Added requirement for justifying eligibility for wildlife management fence projects	Page 46, 1 <sup>st</sup> column	Modification of policy	11/13/19
9	Added ACRP references for guidance on airport passenger surveys and aircraft operation counts	Page 28, 2 <sup>nd</sup> column	Clarification of information	11/13/19	20	Incorporated additional and updated FAA Advisory Circulars, ACRP Reports, Standard Operating Procedures, CFRs, and Orders as applicable	Page 63, Appendix 1	Updated data	11/13/19
10	Added ACRP reference for aviation forecasting	Page 29, 2 <sup>nd</sup> column	Clarification of information	11/13/19	21	Incorporated additional and updated state and federal resources applicable	Page 64, Appendix 1	Updated data	11/13/19
11	Deleted "Number of Student Pilots" and "Number of Hours Flown" as key indicators of aviation demand	Page 29, Table 10	Updated data	11/13/19	22	Add and update hyperlinks to reference documents	Throughout document	Clarification of information	11/13/19



**Part 1**  
**Master Plans: Setting the Stage**

The Florida Department of Transportation (FDOT) Aviation Office, through Chapter 332, Florida Statutes, developed this Guidebook to assist airport owners/sponsors, operators, and consultants in developing effective and attainable Airport Master Plans. It is of the highest importance to FDOT that this Guidebook be utilized to help the state meet its airport improvement needs in a logical and cohesive manner.

A structured and measured approach is critical so that improvement recommendations resulting from a master planning process support the airport’s role as defined in the Florida Aviation System Plan (FASP). These improvement recommendations ultimately become the foundation of the FDOT Joint Automated Capital Improvement Program (JACIP), which is used to program airport development grants.

Chapter 332, F.S. states: “It shall be the duty, function, and responsibility of the Department of Transportation to plan airport systems in this state. In carrying out this duty and responsibility, the department may assist and advise, cooperate, and coordinate with the federal, state, local, or private organizations and individuals in planning such systems of airports, and to promote the further development and improvement of air routes, airport facilities, and landing fields and protect their approaches and to stimulate the development of aviation commerce and air facilities.”

Various factors cause an airport to reassess, update, or develop a Master Plan. When an airport decides to begin the master planning process, the owner/sponsor should utilize this Guidebook to develop a comprehensive planning program that can best meet the needs of the airport and will result in a useful and cost-effective product. While planning report elements and graphic requirements are defined in this Guidebook, airport facilities serving different roles and accommodating different levels of activity will not necessarily require the same planning products or level of study. Because each airport’s Master Plan is based on the characteristics present at the individual airport, this Guidebook presents information in a manner that allows airports to select the information/components specific to their Master Plan.

**Florida Specific Information!**

Look for helpful Florida specific information here!



As such, this Guidebook should be looked at as a menu of planning tasks and products which can be individually selected to meet comprehensive airport planning needs and requirements. It has been designed to help the user better understand the planning process, the role of stakeholders, the components of the plan, and the approval process. This last consideration is critical as Master Plans must ultimately be submitted to FDOT for final review and

approval to ensure projects resulting from the Master Plan are eligible for state funding. In addition, Federal Aviation Administration (FAA) review and approval are typically required to ensure projects resulting from the Master Plan are eligible for Federal funding. This Guidebook provides references and checklists that users can apply to research a specific planning related subject in detail and ensure appropriate steps have been completed.

It should be noted that for the remainder of this Guidebook, all references to FDOT are referencing the FDOT Aviation Office and all references to the FAA are referencing the FAA’s Orlando Airports District Office (ADO). Additionally, links providing access to the documents referenced throughout this Guidebook are provided in **Appendix I**.

**What’s New**

This Guidebook was developed to present the most up-to-date thinking on airport master planning in Florida. Since the last version of this document was updated in 2018, there have been changes to Federal and State guidance, regulations and several draft Advisory Circulars released for public comment.

**Purpose of the Guidebook**

A Master Plan is the framework of an airport’s conceptual short-, medium-, and long-term facility development requirements and strategy based on current and future conditions of the airport and aviation industry, based on a variety of factors considered during the development of the plan. This plan is documented and approved by the local governmental agency or authority, which owns and/or operates the airport, referred to as the sponsor. A Master Plan provides the data and the justification upon which the plan is based in a narrative format and illustrates the ultimate development concepts as an Airport Layout Plan (ALP) drawing. Airport Master Plans are regularly updated to support preservation, development, expansion, and modernization of existing airports, as well as to justify construction of additional airports needed to accommodate growth in demand for aviation services on a local, regional and national basis.

This Guidebook is intended to provide guidance in the development, preparation, and use of Airport Master Plans in Florida. Step-by-step instructions carry the user through the preparation of the scope of services for the actual development of the plans. This Guidebook is the standard by which all Florida airport master planning documents will be produced.

**Therefore, all Florida Airport Master Plans should be consistent with this Guidebook.**

The sponsor is ultimately responsible for approving the Airport Master Plan and Airport Layout Plan based on the contents of the plan and accuracy of the data.

**The Florida Philosophy of Airport Master Planning**

Florida’s philosophy of airport master planning is to encourage effective airport planning while reducing costs by:

- Only updating the information in the necessary elements when needed
- Focusing on computer-based rather than paper-based Airport Master Plan information

This philosophical approach to airport master planning is consistent with the current state of the industry as reflected in all levels of aviation planning. As such, employment of technological resources is prudent given the need to keep critical airport information up-to-date, as well as to utilize public monies appropriately and efficiently.

FDOT’s philosophy on Airport Master Planning is provided in **FDOT Procedure No:725-040-100 (series), Airport Master Plans**.

The FDOT philosophy of airport master planning allows an airport manager to focus on critical issues in a timely manner without carrying the burden of managing an unnecessarily large planning project.

Traditionally, this type of update could prove to be a time-consuming endeavor, whereby the airport could lose funding support due to any delay. However, by utilizing the FDOT approach, an airport manager or staff can typically enact the update and obtain FDOT district office approval more quickly. While it is understood that this process would take longer if the ALP itself had to be altered and approved, even this additional level of effort could be completed in a reasonable timeframe, possibly by airport staff alone,

if the required effort was kept at a minimum. FDOT coordination should take place to determine the minimum necessary steps before any are by-passed to ensure proper procedures are followed.

Within this master planning philosophy, FDOT generally views the individual planning elements as separate modules that can be added, deleted, and changed individually at any time as long as the necessary justification is shown for any added projects. Consideration of the impact to the entire Master Plan from changing individual elements should be given, ensuring that the overall Master Plan still remains generally valid. Thus, the Airport Master Plan itself is not a static document, but in fact becomes a continuing, dynamic process that is always evolving and is easy to update as necessary.

**Guidebook Structure and Use**

This Guidebook was developed as a singular reference for Florida airports completing an airport master plan, which is intended to augment the existing resources provided by the FAA. This Guidebook provides Florida-specific information related to the additional requirements of FDOT, State Statutes, Administrative Codes, and other state agencies that are applicable to Florida airports beyond FAA guidance. To support the inclusion of Florida-specific information, call-out boxes have been added throughout the Guidebook to highlight Florida-specific information that is pertinent to and required as part of the master planning process.

The remainder of this Guidebook is divided into three parts: Part 1 – Master Plans: Setting the Stage, Part 2 – Master Plans: Developing the Vision, and Part 3 – Master Plans: Product Development. Because it is understood that different users of this Guidebook have different levels of interest or use, this section provides high level information on what components different users may need. In general terms, each part includes the following information:

- **Part 1 – Master Plans: Setting the Stage**
  - Introduces basic information on Master Plans as well as summarizes state and Federal guidance on Master Planning. Users who are unfamiliar with airport master plans or the airport master planning methods should use this chapter to gain a better understanding of the overall process behind them.
  - Provides high level information on the master planning process, types of master plans, as well as other types of planning efforts that should be considered when completing a master plan.
  - Provides information on the various types of FDOT and FAA resources that are available for master planning efforts.
- **Part 2 – Master Plans: Developing the Vision**
  - Details the beginning steps of a Master Plan, including pre-planning and scoping.
  - Provides detailed information on the scope development process, including the initial planning effort that must go into it.
  - Acts as a resource for users at all experience levels, either as a step-by-step guide or high-level review related to the master plan scoping process.
- **Part 3 – Master Plans: Product Development**
  - Walks users through all of the Master Plan elements and allows them to select the information that will be useful in developing a Master Plan.
  - Contains all the traditional elements of a master plan and provides useful information on what should be included in each section as well as the process to complete each section.
  - Serves as a reference for users at all experience levels to ensure that master plans are developed in accordance with FDOT guidance.

### Introduction

Planning for the future of an airport is the fundamental responsibility of any airport sponsor. Generally, airport planning has been described as the use of an organized strategy for the future management and development of airport policies, facility designs and configurations, financial allocations and revenues, environmental considerations, and organizational structures. The development of a comprehensive and attainable Airport Master Plan is a primary responsibility of a sponsor. This Guidebook lays the foundation for the development of each phase of a Master Plan and provides information on coordination throughout the process.

### Setting the Stage

At the most comprehensive level, airport planning guides the development of airports within the local, state, and national airport system. Structurally, airport planning in Florida is classified in the following manner:

- National Plan of Integrated Airport Systems (National System Plan)
- Florida Aviation System Plan (State System Plan)
- Airport Master Plans (Individual Airport Plan)

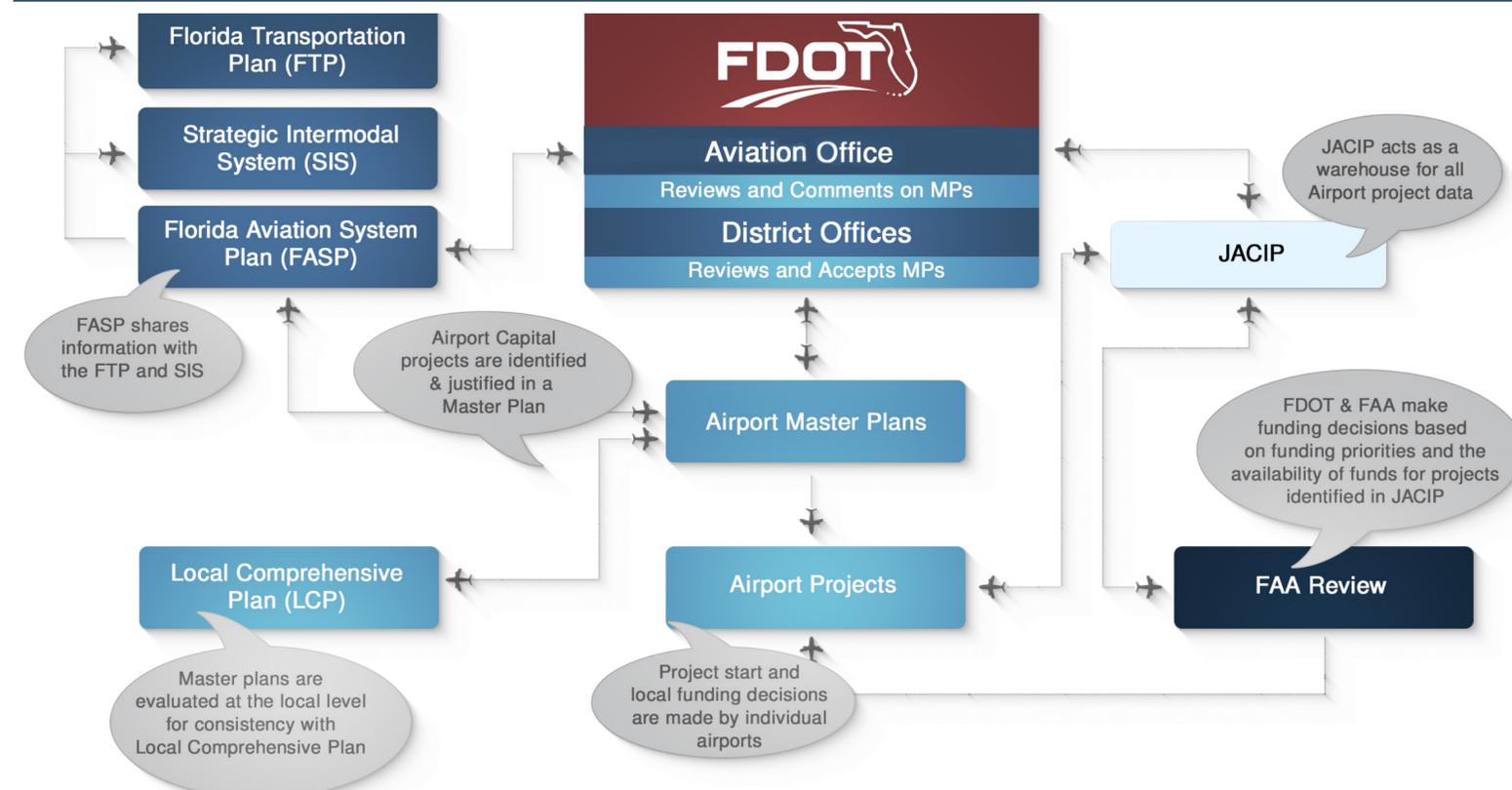
Under this structure, Master Plans are the most localized form of airport planning in Florida. However, the relationship between Master Plans, the national system plan and the state system plan—and their funding mechanisms—must be understood. To clarify this relationship, Part 1 of this Guidebook is divided into the following two sections:

- Airport Master Plans
- State/Federal Guidelines and Regulatory Requirements

Together, these sections provide the framework for the preparation of a Master Plan. Furthermore, Figure 1 displays the interrelated connectivity between airport master plans, the FAA, FDOT, and local governments. It also highlights how airport master plan recommendations are programmed for project funding.



**FIGURE 1. FLORIDA AIRPORTS PLANNING PROCESS FLOWCHART**



### Airport Master Plans

At its core, an Airport Master Plan is a comprehensive analysis of an airport that ultimately illustrates the short-, medium-, and long-term development plans to meet the future aviation demand requirements in a safe, sustainable, and cost-effective manner. The elements of a Master Plan vary in complexity and level of detail, depending on the size, function, issues, opportunities, and conditions of the individual airport. A successful Airport Master Plan is presented in a professional format that effectively communicates the research, process, and justification from which the final development plan was created to the airport stakeholders.

### FAA Coordination

For federally obligated airports, extensive coordination with the FAA and its local Airports District Office (ADO) in Orlando is critical for any Airport Master Plan project. Though the FAA is only responsible for approving the scope of work, aviation forecasts, critical aircraft, and the ALP, utilizing the FAA as a resource throughout the process helps to ensure planning consistency and compliance with current standards. The FAA does not fund projects that are not shown on the ALP. Therefore, FAA approval of the ALP is critical. It is recommended that FAA approval is obtained during the scoping process to ensure the project begins and ends with the appropriate information. Suggestions for FAA coordination and required approvals are provided throughout this Guidebook.

### FDOT Coordination

Coordination with FDOT is imperative at all stages of the master planning process. Beginning prior to the scoping effort and through final documentation FDOT is responsible for reviewing all deliverables of a Master Plan and ultimately conditionally accepting the plan. FDOT's approval is critical. FDOT is unlikely to fund projects not justified through an approved master plan or ALP.

Coordination with both FAA and FDOT throughout the planning process is key to ensuring a successful and appropriate Master Plan scope and project. This guidance affords greater control of the process, ensuring a higher quality product for the end users. Thus, regardless of the source of funding, both the FAA and FDOT should be consulted prior to beginning the Master Plan scoping process to confirm that an appropriate scope of work is developed. More information on this coordination effort is provided in **Part 2 – Master Plans: Developing the Vision** (page 11).

### Types of Airport Master Plans

Based on each individual airport's situation and needs, a Master Plan can take a variety of forms. Because of this, the elements of a Master Plan vary in complexity and level of detail, depending on the size, function, issues, opportunities, and constraints of the individual airport. This section introduces the two primary types of Master Planning studies an airport can develop; these include:

TYPES OF AIRPORT MASTER PLANS	
Master Plans	ALP
Master Plan Updates Comprehensive "From Scratch" Master Plans	ALP Updates with Narrative ALP "Pen and Ink" Changes

### Master Plans

**FAA Advisory Circular (AC) 150/5070-6B Airport Master Plans**, defines the different types of master plans as:

"Master planning studies that address major revisions are commonly referred to as "Master Plans," while those that change only parts of the existing document and require a relatively low level of effort tend to be known as "Master Plan Updates." In common usage, however, the distinction refers to the relative levels of effort and detail of master planning studies."

For the purposes of this section, Master Plan Updates and Comprehensive "From Scratch" Master Plans are considered the same; however, it is the intent of this Guidebook to provide the guidance necessary for an airport to determine the appropriate type of study that is needed at their airport. In most instances, a Master Plan will include at least some form of the following sections:

- Public Involvement
- Environmental Considerations
- Existing Conditions
- Aviation Forecasts

- Facility Requirements
- Alternatives Evaluation
- Airport Layout Plans (as described below, these can also be completed as a stand-alone project)
- Facilities Implementation Plan
- Financial Feasibility Analysis



A Master Plan study always includes a technical report and an ALP drawing set, in addition to many supplemental deliverables. In terms of elements of the technical report, an Airport Master Plan should contain those listed above, which are discussed in detail in **Part 3 – Master Plans: Product Development** (page 19).

#### Master Plan Update

A Master Plan Update is the most common form of Master Plan. Many airports have completed a Master Plan within the last five to seven years that still reflects similar conditions at the airport. As such, basic data and information such as facility inventory, regional ground access, or ALP data from previous studies can be reviewed and updated for current conditions rather than collecting “from scratch,” which reduces the

costs associated with data collection tasks. A Master Plan Update should still include all the “traditional” master planning components described in Part 3 – Master Plans: Product Development, but benefits from using sections or information from previous studies.

#### Comprehensive “From Scratch” Master Plans

A Comprehensive “From Scratch” Master Plan is conducted at an airport that has not previously completed a Master Plan or that has an existing Master Plan that is out-of-date and no longer reflects the conditions at the airport. A “new” Master Plan document should only be completed by new airports or airports that have never completed a previous Master Plan. In this instance, all data collection and development need to be completed. It is likely that most comprehensive “from scratch” Master Plans have components that must be redone entirely, while others may be able to update limited sections from the previous Master Plan or Master Plan Update.

#### Airport Layout Plan Updates

In terms of a master planning study and the associated level of effort required to address particular issues, an ALP Update may be an appropriate alternative to a full Airport Master Plan Update. This is particularly true whenever the fundamental assumptions of the previous Master Plan (e.g. major changes in airport activity, improvements that have had unanticipated consequences, etc.) have not changed.

#### ALP Update with Narrative

An ALP drawing set is the principle deliverable of all Airport Master Plan efforts because maintaining a current ALP is a legal requirement for any airport that receives federal or state funding assistance. Generally, airports with less than 50 based aircraft, an ALP Update with a narrative report is recommended instead of a full Master Plan. Typically, an ALP Update involves fewer elements than that of a full Master Plan study, but does include the elements below as defined by FAA [AC 150/5070-6B, Airport Master Plans](#):

- Basic aeronautical forecasts
- Identification of the basis for the proposed items of development
- Rationale for unusual design features and/or modifications to FAA Airport Design Standards
- Summary of the various stages of airport development and layout sketches of the major items of development in each stage

\*(Note that if additional steps are required to complete the ALP Update, a full Master Plan study is likely more appropriate.)

The narrative report accompanying the ALP drawing set would provide some of these details, such as forecasts, as the details would not be illustrated in the ALP drawing set. A narrative report typically includes the following sections:

- Airport activity forecast that supports the need for the proposed development
- Airport reference code (ARC and also referred to as the “design” aircraft) and Runway Design Code (RDC) on which the proposed development is based
- Rationale for the proposed development (e.g. runway length)
- Rationale for any modifications of standards (including an alternatives analysis)
- Development schedule for each stage of development, i.e. 5-, 10- and 20-year plan. (This schedule should be based on activity levels, not just the years these levels are forecast to occur)

The FAA’s [Standard Operating Procedure \(SOP\) 2.00](#) establishes procedures for the FAA’s review and approval of ALPs. It is recommended that this SOP be followed whenever an airport is making modifications to their ALP along with coordination with the FAA to ensure all applicable components will be included. More information on ALPs can be found in **Part 2 – Master Plans: Developing the Vision** (page 11) as well as in **Part 3 – Master Plans: Product Development** (page 19).

#### ALP “Pen and Ink” Changes

Almost all Florida airports have FAA-approved ALPs on file; therefore, in most instances, ALPs are completed as ALP Updates. In some cases, informal revisions to an ALP are appropriate. These revisions, called “pen and ink” changes, are based on small changes such as a new T-hangar or to update an ALP based on as-builts following construction. “Pen and ink” changes are most commonly minor modifications to individual sheets of the ALP, and do not represent a major change in the information or conditions depicted in the ALP. “Pen and ink” changes, however, are still required to be reviewed, coordinated, and approved through FDOT and the FAA and will require some type of supporting documentation based on the scale of the change.

#### Products of an Airport Master Plan

The products of the master planning process vary with the complexity of the effort. However, most Master Plans include the following deliverables described below. (Note that these deliverables are described in detail in Part 3 – Master Plans: Product Development.)

#### Master Plan Document

The overall Master Plan document contains the primary technical report that reflects the results of the analyses conducted during the development of the Master Plan. The Master Plan document generally contains the standard Master Plan components including inventory, aviation forecasts, alternatives analysis, and capital improvement plan. For complex studies, interim reports could be produced to facilitate coordination with various government agencies, tenants, users, the public, and other interested parties. Additionally, a summary or executive report is often beneficial to bring together pertinent facts, conclusions, and recommendations for a streamlined review by the public and other stakeholders. Such a report is an excellent place to highlight the economic benefits that flow from the airport to the communities it serves.

#### Airport Layout Plan Drawing Set

Other than the overall document itself, the ultimate deliverable of an airport Master Plan effort is the ALP drawing set. The ALP depicts existing airport facilities and proposed developments as determined from the planners’ review of the aviation activity forecasts, facility requirements, and alternatives analysis. This plan set can vary in the number and types of sheets included depending on the complexity and requirements of the airport. The individual ALP sheet depicting proposed development at the airport is approved and signed by the airport sponsor and the FAA. When implementing projects on an airport, they must be consistent with a current, approved ALP. This requirement is fully explained in Assurance No: 7 – *Consistency with Airport Master Plan and Airport Layout Plan* found in Section D of Exhibit E Aviation Program Assurances ([FDOT Form 725-000-02](#)).

#### Capital Improvement Plan

The Capital Improvement Plan (CIP) includes all projects proposed as part of the master planning effort, including those not eligible for federal and state funding (ex: maintenance and building repair). The realistic CIP is of the utmost importance as it flows into the planning module of the [FAA’s System of Airport Reporting \(SOAR\)](#) for the airport, as well as the FDOT Joint Automated Capital Improvement Program (JACIP), which is used to program airport development grants.

Airport sponsors are required by Assurance No: 8 – *Airport Financial Plan of Exhibit “E” Aviation Program Assurances* to develop and maintain a cost-feasible financial plan to accomplish the proposed improvements in an Airport Master Plan.

### Final Deliverables

Beyond the standard paper deliverables of the Master Plan technical report and ALP drawing set, electronic copies of all deliverables must be delivered in appropriate formats for future use. Formats could include those used for publication on internet resources, for use in CAD and/or Geographic Information System (GIS) programs, and for use in various other technological applications.

### Standardization of Products

While developing a Master Plan, planners should consider the potential additional costs and inefficiencies of overly creative approaches to a study. The potential inefficiencies that can result from the lack of consistency in approach of deliverables are of particular concern, as multiple airport Master Plan efforts are conducted within Florida every year. It is important to understand that each one of these Master Plan projects must be managed by airport staff, developed by a consultant, and reviewed by FDOT and the FAA. Furthermore, the cost estimates must be entered into the FAA and FDOT capital improvement programs, as well as the statewide Florida Aviation System Plan database, in order to estimate future Florida airport funding needs. As such, any additional effort required for this multi-layered process due to an overly creative planning approach likely results in increased and unnecessary costs.

Therefore, it is anticipated that cost savings can be realized if Master Plan deliverables are standardized as proposed by this Guidebook. A consistency of approach to products affords the airport, its consultants, the reviewing agencies, and the database managers the ability to anticipate the order and format of data resulting from the Master Plans, allowing all to recognize and take advantage of potential efficiencies.

### Relationship to Funding

The FAA and FDOT make planning grants available to airport owners/sponsors for airport planning studies. It is important that the airport owner/sponsor work closely with the FAA and/or the FDOT to ensure that the airport-planning project is justified, that the scope of work reflects the actual planning requirements of the airport, and that the proper steps for securing funding are taken.

Regardless of the funding source (federal, state, or local), the airport owner/sponsor should schedule a meeting with the FDOT and FAA to discuss the project’s justification, goals, and any special issues that need to be addressed. This meeting allows the owner/sponsor, FDOT, and the FAA to work as a team to verify the justification and outline a preliminary scope of work specific to the individual project needs and characteristics of the airport.

To assist in understanding the funding process, FDOT developed the [Florida Aviation Project Handbook](#) to help airports better understand the funding of airport projects in Florida. The primary funding mechanism for planning studies in Florida is the Florida Aviation Grant Program, while Federal funding is provided through the Airport Improvement Program (AIP).

### Relationship to Other Planning Efforts

A relationship to other planning efforts and dynamic discipline that can encompass all elements of aviation facilities and operations. As such, airport planning is a continuing effort that should be coordinated and integrated in order to ensure that multiple efforts support each other in an efficient and effective manner. Though system plans are briefly introduced, this Guidebook focuses on planning at the individual airport level. Strategic planning is the primary guide for all other planning efforts as it drives the long-term vision of the airport and is supported by all subsequent planning efforts. These planning studies and their relationship/correlation to the Master Plan effort are discussed below.

It should be noted that the integration of these different planning studies form a chain of influence. For instance, a Master Plan affects a financial plan through the recommended development, which affects the business plan through the expected cash flow. This interrelatedness of planning activities highlights the importance of understanding how these documents correlate with each other. It is important to recognize that all levels of airport planning play a critical role within their respective areas of analysis. Therefore, they must be thoughtfully integrated in order to ensure the overall success of these multi-layered planning initiatives. Below is a listing of other planning efforts that should be considered when developing an airport master plan or ALP update. More detailed information on these plans is available in [Appendix 2](#).



### Strategic Plans

Airport strategic planning provides a long-term framework that guides an airport towards achieving its future goals.

### Business Plans

An airport business plan lays out the goals and objectives of the airport sponsor that are not directly related to facility requirements as in the Master Plan, but can inform facility-related needs.

### Marketing Plans/Analysis

Marketing plans are developed by airports as a way to promote the facilities and services that are available at an airport.

### Compatible Land-Use Plans

Land-use planning can encompass both on- and off-airport applications. While on-airport land-use planning is typically addressed within the context of an Airport Master Plan, off-airport land-use planning has become a critical component of an airport’s long-term growth and sustainability strategy.

### Sustainability Plans

Sustainability planning integrates sustainability into an airport’s long-range plan. Guidelines on sustainability practices are available on the [ACRP website](#).

### Asset Management

Systematic and coordinated activities and practices through which an organization optimally and sustainably manages its assets and asset systems, their associated performance, risks and expenditures over their lifecycles for the purposes of achieving its organizational strategic plan.

### Financial Plans

Financial planning within the airport spectrum can encompass a wide array of analyses, ranging from a proposed project’s cost-benefit analysis to the financial sustainability and economic impact of an entire airport system.

### Terminal Area Plans

The terminal area is the interface between landside and airside operations for aircraft passengers.

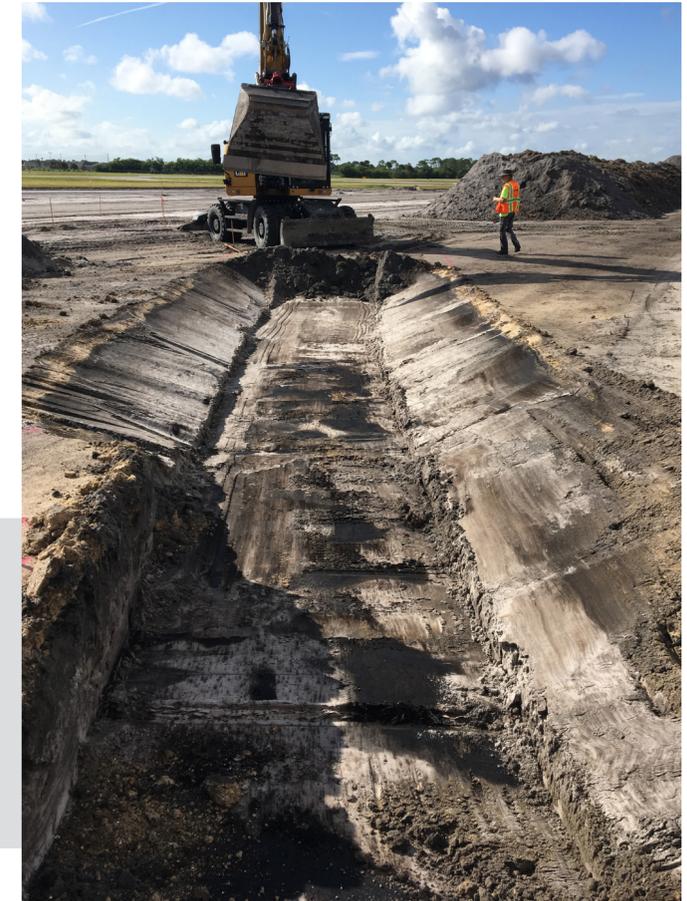
### System Plans

An airport system plan is a representation of the aviation facilities and service required to meet the needs of a metropolitan area, region, state or country.

### Additional Planning Efforts

- Environmental Impact Studies
- Project Feasibility Studies
- Land Acquisition Studies
- Wildlife Hazard Studies
- Site Selection Studies
- Stormwater and Drainage Plans
- Pavement Maintenance Management Plans
- Municipal Codes, Ordinances, and Zoning Regulations

This list of plans and studies is not all inclusive; other documents may also affect the master planning process and should be explored as applicable.



# PART 1 – MASTER PLANS: SETTING THE STAGE

## STATE/FEDERAL GUIDELINES AND REGULATORY REQUIREMENTS

Federal and state regulatory requirements and guidelines play a significant role in the development of the Florida Aviation System. In an effort to support airport development that is both safe and compatible with the local community, federal and state agencies participate in airport development and provide regulatory guidance to airport sponsors. In many cases, both FAA and FDOT policies and procedures are complementary. The following paragraphs briefly summarize the relationship between these two agencies.

The FAA typically reviews all elements of a Master Plan to ensure that sound planning techniques have been applied. Currently, the key Master Plan components that the FAA evaluates and formally approves are the Forecasts of Aviation Demand, Selection of Critical Aircraft, and the Airport Layout Plan (ALP). This is affirmed through a federal statute related to ALPs. Title 49 of the United States Code (USC), specifically **49 USC 47107(a)(16)**, obligates an airport sponsor to **“keep up to date, at all times, a layout plan of the airport.”**

All airport development at federally obligated airports must be implemented in accordance with the FAA and sponsor-approved ALP. Additionally, proposed development must be shown on an ALP to be eligible for AIP funding. FAA conditional approval of the ALP indicates that existing facilities and proposed development depicted in the ALP conforms to the FAA airport design standards in effect at the time of the approval and that the FAA finds the proposed development to be safe and efficient. Specifically, Section 3-17 of **FAA Order 5100.38C AIP Handbook** states:

*“49 USC § 47107(a)(16) requires that the sponsor must maintain a current airport layout plan (ALP). It also prohibits the sponsor from altering the airport unless the ADO has determined that the project will not adversely affect the safety, utility, and efficiency of the airport. Per FAA policy, the ADO must not program a project that needs to be added to an FAA approved ALP until the sponsor submits a revised ALP and it receives FAA approval. Therefore, for projects not shown on the approved ALP that are expected to have a significant impact on aeronautical or airport operations, the ADO must advise the sponsor to complete an ALP Update for FAA review and approval.”*

At the state level, Chapter 332, F.S. defines the duties and responsibilities of FDOT. **Section 332.007(5)** is a key provision within Chapter 332 which directly parallel to FAA funding requirements:

*“Only those projects or programs provided for in this act that will contribute to the implementation of the state aviation system plan, that are consistent with and will contribute to the implementation of any airport master plan or layout plan, and that are consistent, to the maximum extent feasible, with the approved local government comprehensive plans of the units of government in which the airport is located are eligible for the expenditure of state funds in accordance with fund participation rates and priorities established herein.”*

Similar to the FAA AIP Handbook, FDOT Procedure **725-040-040 Aviation Program Management** states *“to be eligible for FDOT funding, the airport sponsor must have an **FDOT approved Master Plan and airport layout plan** that has been developed in accordance with FDOT Procedure **725-040-100, Airport Master Plans.**”*

The FDOT Airport Master Plan Procedure provides additional guidance related to Master Plan projects; however, the key element within this procedure states **“the Guidebook is the standard in which all master planning documents will be produced.”** Thus, this Guidebook update not only addresses changes in both federal and state requirements and guidelines, it also complies with the Airport Master Plan procedure.

Additionally, the **Florida Aviation System Plan (FASP)** is the statewide planning document that prescribes the recommended growth plan for all Florida airports to support future aviation demand. Thus, when developing a Master Plan, these documents must be reviewed in order to have an understanding of the state requirements for developing an Airport Master Plan.

Though much more is discussed in subsequent sections, understanding how FAA and FDOT requirements parallel and augment each other validates that **close coordination with both agencies is not only a requirement, but imperative for the success of any Master Plan.** Florida’s airports also have a luxury few others do: all of the airports are under one FAA ADO and the Orlando ADO services no other states. This unique relationship provides the airports in Florida, FDOT, and the Orlando ADO with an environment that allows all to work together towards common goals without the distraction of adjacent priorities or program development concerns.

Thus, this section of the Guidebook summarizes and synthesizes state and Federal guidance as well as provides tips to consider during the development of a Master Plan or ALP Update. Counties, cities, authorities, and municipalities may also provide local guidance that can be utilized, although that is addressed on an airport-by-airport basis.

### Federal Master Plan Guidance

Federal guidance provides the technical basis for all airport development. Typical guidance is provided in the form of FAA Advisory Circulars, or ACs. It is important to note that compliance with many ACs is mandatory for federally obligated airports through Grant Assurance 34 – Policies, Standards, and Specifications. The documents shown in Table 1 should all be referenced both prior to and during the development of an Airport Master Plan. As shown, Table 1 provides a summary of the Federal Master Plan Guidance, as well

as suggestions on the individual sections of a Master Plan where the guidance should be utilized. More information on each of the documents or resources shown in Table 1 can be found in Appendix 3 and the most current version of the FAA documents referenced can be accessed at:

**FAA Advisory Circulars**  
**FAA Standard Operating Procedures**  
**Order 5100.38D AIP Handbook**

**CFR Part 77**  
**Aviation Forecasts**  
**Sustainability/Recycling**

TABLE 1. FAA AIRPORT MASTER PLAN GUIDANCE FOR FEDERALLY OBLIGATED AIRPORTS	
Document	Master Plan Sections that Should Consider Document
<b>AC 150/5070-6B: Airport Master Plans</b>	• All sections
<b>AC 150/5300-13A: Airport Design</b>	• Facility Requirements • Alternatives This AC provides design standards that will assist in understanding facility requirements and developing suitable alternatives recommendations.
<b>AC 150/5060-5: Airport Capacity and Delay</b>	• Facility Requirements • Alternatives • ALP This AC allows airports to understand what capacity issues exist (or are anticipated) and recommends suggestions for mitigating deficiencies.
<b>Standard Operating Procedure (S.O.P.) No. 2.00: FAA Review and Approval of Airport Layout Plans (ALPs)</b>	• ALP • Narrative Report
<b>S.O.P. No. 3.00: FAA Review of Exhibit 'A' Airport Property Inventory Maps</b>	• ALP
<b>S.O.P. 8.00: Runway Safety Area Determination</b>	• ALP • Narrative Report
<b>Order 5100.38D: Airport Improvement Handbook</b>	• All sections
<b>14 CFR Part 77: Safe, Efficient Use, and Preservation of the Navigable Airspace</b>	• Facility Requirements • Alternatives • ALP Part 77 provides height notification requirements for proposed objects surrounding an airport.
<b>Forecasting Aviation Activity by Airport</b>	• Aviation Forecasts
<b>FAA Recycling, Reuse and Waste Reduction at Airports: A Synthesis Document</b>	• Environmental • Existing Conditions This document provides baseline information to assist in identifying sustainability programs at an airport.

## State/FDOT Guidelines and Guidance

Just as federal guidance provided by the FAA provides the basis for all airport development, Florida Statutes provide the basis for all development within Florida. In most instances FAA and FDOT guidance will be complimentary; however, there are regulations specific to Florida that are provided through Florida Statutes and Florida Administrative Code. The following is a summary of the related airport planning and development documents. As shown, **Table 2** provides a summary of the state regulations and FDOT procedures and guidance as well as suggestions on the individual sections of a Master Plan for which the guidance should be utilized. More information on each of the documents or resources shown in **Table 2** can be found in **Appendix 3** and can be accessed at: <http://www.fdot.gov/aviation/flpub.shtm>.

**TABLE 2. FDOT/STATE OF FLORIDA AIRPORT MASTER PLAN GUIDANCE**

Document	Master Plan Sections that Should Consider Document
<b>Florida Statute 332: Airports and Other Air Navigation Facilities</b>	<ul style="list-style-type: none"> <li>All sections</li> </ul>
<b>Airport Master Plans</b> FDOT Topic No. 725-040-100-i Last Update: 2016	<ul style="list-style-type: none"> <li>All sections</li> </ul> <p>This document provides information on the review and approval process that FDOT follows during a Master Plan.</p>
<b>Aviation Program Management</b> FDOT Topic No. 725-040-040-k Last Update: 2012	<ul style="list-style-type: none"> <li>As Needed</li> </ul>
<b>Exhibit E: Aviation Program Assurances</b> FDOT Form 725-000-02 and Public Transportation Grant Agreement FDOT Form No. 725-000-01	<ul style="list-style-type: none"> <li>As Needed</li> </ul>
<b>Florida Aviation System Plan 2035</b> Last Update: 2017 Next Update: 2023	<ul style="list-style-type: none"> <li>Existing Conditions</li> <li>Aviation Forecasts</li> <li>Alternatives</li> </ul> <p>FASP 2035 helps an airport understand their role within the regional and state aviation system. All recommendations in a Master Plan must be in accordance with the FASP.</p>
<b>Florida Statute 333: Airport Zoning</b>	<ul style="list-style-type: none"> <li>Public/Stakeholder Involvement</li> <li>Environmental</li> <li>Existing Conditions</li> <li>Alternatives</li> <li>ALPs</li> </ul> <p>Chapter 333 helps airports understand the limitations of land uses and intensities of land surrounding their airport and requires airport protection zoning.</p>
<b>Florida Administrative Code 14-60: Airport Licensing, Registration, and Airspace Protection</b>	<ul style="list-style-type: none"> <li>Existing Conditions</li> <li>Alternatives</li> <li>Facility Requirements</li> <li>ALPs</li> </ul> <p>Rule 14-60 provides airport standards that ensure safe airport operation by allowing airport to compliance with current state licensing standards.</p>
<b>Florida Statute 163: Intergovernmental Programs</b>	<ul style="list-style-type: none"> <li>Public/Stakeholder Involvement</li> <li>Existing Conditions</li> <li>Alternatives</li> <li>ALPs</li> </ul> <p>Chapter 163 identifies how airport planning relates to local planning efforts and the interrelatedness of various local plans.</p>

## Additional FAA Guidance and Regulation

In addition to the primary FAA resource documents, the following documents are also recommended to be reviewed based on the scope of a Master Plan. **Table 3** provides a summary of the additional Federal Master Plan Guidance as well as suggestions on the individual sections of a Master Plan where the guidance should be utilized. More information on each of the documents or resources shown in **Table 3** can be found in **Appendix 3** and the current version of these FAA ACs can be accessed at: [www.faa.gov/regulations\\_policies/advisory\\_circulars/](http://www.faa.gov/regulations_policies/advisory_circulars/).

**TABLE 3. ADDITIONAL FAA AIRPORT MASTER PLAN GUIDANCE FOR FEDERALLY OBLIGATED AIRPORTS**

Document	Master Plan Sections that Should Consider Document
<b>AC 150/5075-7: The Airport Planning System Process</b>	<ul style="list-style-type: none"> <li>As needed</li> </ul>
<b>AC 150/5100-14E: Architectural, Engineering, and Planning Consultant Services for Airport Grant Projects</b>	<ul style="list-style-type: none"> <li>Scoping</li> </ul>
<b>AC 150/5300-16A: General Guidance and Specifications for Aeronautical Surveys: Establishment of Geodetic Control and Submission to the National Geodetic Survey</b>	<ul style="list-style-type: none"> <li>Existing Conditions</li> <li>ALPs</li> </ul> <p>This AC will be helpful if an aeronautical survey is needed as part of a Master Plan.</p>
<b>AC 150/5300-17C: Standards for Using Remote Sensing Technologies in Airport Surveys</b>	<ul style="list-style-type: none"> <li>Existing Conditions</li> <li>ALPs</li> </ul> <p>Though this AC does not specifically relate to Master Plans, its information may be helpful if a survey is needed.</p>
<b>AC 150/5300-18B: General Guidance and Specifications for Submission of Aeronautical Surveys to NGS: Field Data Collection and Geographic Information System (GIS) Standards</b>	<ul style="list-style-type: none"> <li>Existing Conditions</li> <li>ALPs</li> </ul> <p>For airports completing AGIS or any aeronautical survey, this AC is helpful in understanding the standards.</p>
<b>AC 150/5300-19: Airport Data and Information</b>	<ul style="list-style-type: none"> <li>Existing Conditions</li> <li>Facility Requirements</li> <li>Alternatives</li> </ul> <p>Though this AC does not specifically relate to Master Plans, its information may be helpful during development.</p>
<b>AC 150/5325-4B: Runway Length Requirements for Airport Design</b>	<ul style="list-style-type: none"> <li>Existing Conditions</li> <li>Forecasting</li> <li>Facility Requirements</li> <li>Alternatives</li> <li>ALPs</li> </ul> <p>Airports that are recommending lengthened or new runways must reference this AC.</p>
<b>AC 150/5100-20: Guidance on the Extraction of Oil and Gas on Federally Obligated Airports</b>	<ul style="list-style-type: none"> <li>As needed</li> </ul>
<b>ARP Standard Operating Procedure 11.00 Consultant Fee Analysis</b>	<ul style="list-style-type: none"> <li>Scoping</li> </ul>
<b>The Brooks Act: Public Law 92-582 Qualification Based Selection</b>	<ul style="list-style-type: none"> <li>As needed</li> </ul>

## Security Guidance and Regulation

In the years following September 11, 2001, numerous laws were passed to enhance security at all airports in the United States. The following four resources provide for numerous aspects of airport security. For any airport completing a Master Plan, use of these resources is suggested. As shown, **Table 4** provides guidance and standards related to airport security and the respective sections of a Master Plan in which the guidance should be addressed. More information on each of the documents or resources shown in **Table 4** can be found in **Appendix 3**.

**TABLE 4. SECURITY GUIDANCE AND REGULATIONS FOR AIRPORT MASTER PLANNING**

Document	Authority	Master Plan Sections that Should Consider Document
<b>Florida Statute 330 Regulation of Aircraft, Pilots, and Airports</b>	State of Florida	<ul style="list-style-type: none"> <li>Existing Conditions</li> <li>Facility Requirements</li> </ul>
<b>Recommended Security Guidelines for Airport Planning, Design, and Construction</b>	TSA	<ul style="list-style-type: none"> <li>Existing Conditions</li> <li>Facility Requirements</li> </ul>
<b>Checkpoint Design Guide (CDG)</b>	TSA	<ul style="list-style-type: none"> <li>Existing Conditions</li> <li>Facility Requirements</li> </ul>
<b>Aviation Security Advisory Committee Guidance</b>	TSA	<ul style="list-style-type: none"> <li>Existing Conditions</li> <li>Facility Requirements</li> </ul>
<b>Title 49 Code of Federal Regulations, Part 1542 Airport Security</b>	Federal Government	<ul style="list-style-type: none"> <li>Existing Conditions</li> <li>Facility Requirements</li> </ul>
<b>Title 49 Code of Federal Regulations, Part 1540 Civil Aviation Security: General Rules</b>	Federal Government	<ul style="list-style-type: none"> <li>Existing Conditions</li> <li>Facility Requirements</li> </ul>
<b>Security Guidelines for General Aviation Airport Operators and Users</b>	TSA	<ul style="list-style-type: none"> <li>Existing Conditions</li> <li>Facility Requirements</li> </ul>



## Part 2

# Master Plans: Developing the Vision

# PART 2 – MASTER PLANS: DEVELOPING THE VISION

## SCOPE DEVELOPMENT

### Introduction

A well-defined scope is critical to the definition and success of any Airport Master Plan. This chapter takes into account the varying goals and objectives of every airport's Master Plan by providing guidance for all airports, regardless of size or desired outcome. Throughout the scoping development process, airports should coordinate with the FAA, FDOT, and relevant stakeholders to identify airport needs and understand how to address them within the Master Plan. This chapter provides the tools necessary for an airport to begin identifying their needs as well as understand how to address those needs in the scoping process.

The three primary components of this chapter are summarized below:

Needs Determination	Pre-Planning	Scope Development
<ul style="list-style-type: none"> <li>Provides a general overview of items to consider before scoping a Master Plan</li> <li>Includes items to consider when determining needs to be addressed during the development process</li> </ul>	<ul style="list-style-type: none"> <li>Helps airports determine specific elements or tasks and consider the general level of effort needed relative to the scope for the Master Plan</li> <li>Discusses how to gather input from relevant stakeholders, determine the desired outcome of the study, and form an estimated budget</li> <li>Discusses the steps in selecting a consultant to perform the study, including the development of Request for Qualifications (RFQ) or Proposals (RFP)</li> </ul>	<ul style="list-style-type: none"> <li>Provides detailed information on how Master Plan elements can be incorporated into a scope based on the needs of the individual airport</li> <li>References information in the respective Master Plan Elements Chapter and allows flexibility when developing sections of a scope</li> </ul>

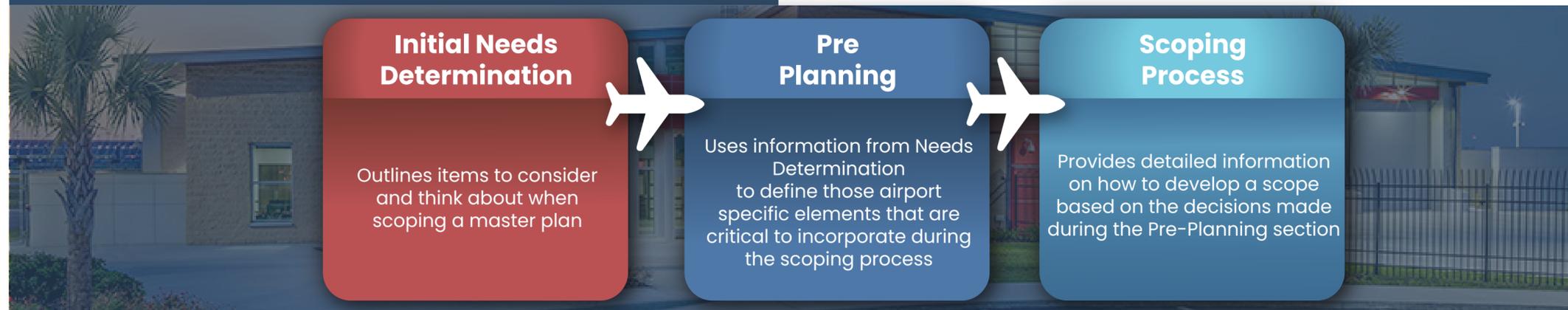
### Using this Chapter

The information contained in this chapter is divided into three distinct components to guide users through the scoping process. Each component builds on previous information, as shown in **Figure 2**.

A more detailed listing of the scope development process is identified in Steps 1 through 5 below. These steps guide users through the entire scoping process and convey the overall order of events that should transpire during the scoping process. Individual sections identified below are referenced as appropriate throughout this chapter.

The information in this Scope Development section was developed to be evaluated with the associated Master Plan Work Element information provided in **Part 3 – Master Plan: Product Development**. As such, information presented herein makes reference to its associated element, as needed. FDOT has certain requirements that must be followed throughout the master planning process. These requirements are detailed in *FDOT Procedure No: FDOT Aviation Office*. These requirements, outlined in **Appendix 4**, include information on the roles and responsibilities of the airport sponsor, FDOT District Office, FDOT Aviation Office, and the FAA, if required. Prior to beginning any Master Plan, the airport sponsor should meet with FDOT to understand the requirements of the entire master planning process.

**FIGURE 2. SCOPE DEVELOPMENT PROCESS FLOWCHART**



**ALTHOUGH INDIVIDUAL MASTER PLAN SCOPING EFFORTS WILL DIFFER FROM AIRPORT TO AIRPORT, THE FOLLOWING STEPS REPRESENT THE TYPICAL PROCESS FOR SCOPING A MASTER PLAN:**

Step 1	Step 2	Step 3	STEP 4	Step 5
Needs Determination and Project Justification	Pre-Planning: Desired Outcomes and Purpose of the Project	Schedule a Project Justification and Scope Meeting with FDOT and the FAA	Requesting Funding from the FAA and FDOT	Approvals and Issuance of Grants
See Initial Needs Determination (page 12).	See the Purpose of the Project and Desired Outcome (pages 12).	The airport sponsor should meet with the FDOT and FAA to discuss the purpose, goals, and special planning issues anticipated for the study. This allows the airport, FAA, and FDOT to verify the justification of the study and ensure project needs are addressed in a preliminary scope. The airport sponsor should use feedback from this meeting to develop an estimated budget range and project schedule.	The JACIP process is the official method of requesting funding through the FAA and FDOT (detailed in Application for State and Federal Funding). The following items should be included in the request and justification discussions with these agencies: <ul style="list-style-type: none"> <li>Statement of project needs, desired outcome, and any special issues</li> <li>Scope of work (see Scoping Process)</li> <li>Project schedule</li> <li>Cost estimates and requested funding sources</li> </ul>	Once a project has been approved, funding is typically provided to the airport in a planning grant from the FAA and/or a JPA from FDOT. It is important to note that once the grant has any funding activity, the airport sponsor is held to certain grant assurances. These assurances, or obligations, require the airport sponsor to maintain and operate the facilities safely and efficiently. Grant approval also triggers a Notice to Proceed (NTP), which means the airport may move forward with the desired project. It should be noted that the costs for work performed prior to the execution of the applicable state grant are not reimbursable from FDOT.



Per FDOT Procedure No: 725-040-100

Information on using this checklist is provided throughout this chapter with the header:

### FDOT COMPLIANCE CHECKLIST ITEM

In the fiscal year that the project is programmed, a project justification and scope meeting between the respective District Office, the FAA, FDOT, and the airport sponsor will be held. The purpose of this meeting will be to establish a preliminary scope of work, and to develop cost estimates for the project.

In this meeting, the sponsor should be prepared to provide a well-organized rationale to support the planning effort which includes the goals of the effort and the issues that the study is intended to resolve.

A complete checklist of steps that must be followed during a Master Plan is provided in Appendix 4, this checklist will ensure compliance with the FDOT Airport Master Planning Procedure.

## Initial Needs Determination

### Introduction

The Initial Needs Determination introduces the scoping process and identifies the “big picture” items to consider when developing a Master Plan scope. The information in this section is general in nature and was developed to provide planners and airport representatives with a starting point for the scoping process. **The Initial Needs Determination is the basis for scope development and is comprised of the following information:**

- **Items to Address in the Scope**
  - Identifies items/issues that could be the impetus for a Master Plan or update
- **Determining the Appropriate Type of Study**
  - Identifies study types to address the airport’s items/issues through stakeholder engagement and existing document review



### FDOT COMPLIANCE CHECKLIST ITEM!

FDOT provides checklist items that must be completed as part of the *Initial Needs Determination and Project Justification* phase of a Master Plan.

These checklist items can be found in:

**Appendix 4, Project Justification and Scope Meeting.**

This information describes the process(es) airports can follow to select an appropriate Master Plan that accomplishes the established goals.

### Items to Address in the Scope

Every Airport Master Plan should be considered a unique project with a scope of work tailored to the individual airport being examined. Designing a Master Plan scope that appropriately addresses an airport’s particular requirements and areas of interest requires an in-depth understanding of all potential considerations and issues. Considerations start by examining existing planning documentation for the airport—whether it be a previous Master Plan or the current approved ALP—to determine the continued validity or extent of change that may be needed. Though nearly all Florida airports have received some form of planning services, their documents may be outdated. **The list below introduces several issues and considerations that could be the impetus for an Airport Master Plan:**

- Capacity demands: landside and airside
- Landside changes:
  - Terminal structures
  - Facility development
  - Access
- Changes to FAA, FDOT, or other regulatory standards or requirements
- Deficiencies or modifications of standards that exist or may likely exist in the future
- Land use development or plans within and around the airport property

- Planned approaches
- State and federal compliance considerations
- Through-the-fence activities
- Anticipated major projects
- Change in airspace

This broad list of items may not reflect several unique conditions some airports face. It is recommended that this list be used as a starting point to determine if an Airport Master Plan is needed. Any number of the items listed above could trigger the need for an Airport Master Plan or update and it is likely that more than one of these items are relevant to most airports. Once an airport understands all the issues and considerations that should be addressed in its Master Plan, the scoping process can begin. As an airport begins this process, **FAA AC 150/5070-6B, Airport Master Plans** indicates that entities involved must answer two important questions:

- What type of study should be conducted?
- What level of detail should be assigned to the individual elements of the study?

Answering these two questions allows an airport to scope a project that best addresses its needs and appropriately budgets the time and resources necessary for the individual components of the selected plan.

### Determining the Appropriate Type of Study

For each airport, the type of study selected should address the specific needs identified previously. As defined in **FAA AC 150/5070-6B, Airport Master Plans**, Airport Master Plans and ALP Updates generally contain the elements identified in **Table 5.**

**TABLE 5. AIRPORT MASTER PLAN AND ALP ELEMENTS**

Master Plans	Airport Layout Plan Updates
Public involvement	Basic aviation forecasts
Existing conditions	Basis for development
Environmental considerations	Rationale for modifications to standards
Aviation forecasts	Summary of stages of development
Facility requirements	Sketches of development in each stage
Alternatives development	
Facilities implementation plan	
Financial feasibility analysis	

Coordination with FDOT, the FAA, and stakeholders is key to identifying the most suitable study. It is recommended that the airport involve both the FAA and FDOT as early as possible in the process to ensure all requirements are addressed. Involving non-governmental stakeholders (tenants, FBOs, etc.) adds airport-specific feedback and accounts for local issues.

## Pre-Planning

### Introduction

Once the Needs Determination process is complete, the airport then moves into the Pre-Planning process. Since each airport’s master planning efforts are unique, this section highlights the steps that should be followed to effectively pre-plan a scope of work that suits the airport. Information provided in **FAA AC 150/5070-6B, Airport Master Plans** is primarily referenced to provide cohesive direction for airport master planning. Specific information and details related to master planning in Florida are included, as applicable.

This section was developed with the following steps:

- Purpose of the Project
- Desired Outcome
- Budget
- Application for Funding
- Approvals
- Consultant Selection

The following subsections lay out the Pre-Planning process, after which the airport sponsor should be prepared to develop a scope that addresses its needs.

### Purpose of the Project

The airport sponsor should cultivate a project purpose to justify developing or updating a master planning study. This purpose should be broad enough to encompass the entire project but also focus on the specific issues the Master Plan must address.

At this stage, the airport sponsor has data from the Initial Needs Determination regarding the issues that triggered the need for a Master Plan. The airport sponsor should engage stakeholders to formulate priorities, establish what is most important, and address the airport’s existing and projected needs. **Figure 3** graphically shows the collaborative process that occurs when identifying key items for a Master Plan.

**FIGURE 3. PRE-PLANNING EFFORT**

### Airport Priority Item Identification



### Florida Specific Information!



Per FDOT, the airport sponsor must provide the following items to the FDOT District Office before the issuance of a planning grant:

1. Type of study
2. Statement of project needs, goals and objectives, and identified special issues
3. Proposed scope of work
4. A copy of the completed FAA ARP SOP 2.00 (include ARP SOP 3.00 if applicable)
5. Project schedule
6. Cost estimates and requested state funds

Meetings between the airport sponsor, the FAA, and FDOT representatives, as well as airport tenants and stakeholders, provide an opportunity to review potential needs and deficiencies associated with the proposed Master Plan. During this process, the airport sponsor should prioritize what is needed to comply with safety requirements, design standards, and state licensing standards. Non-essential items should be acknowledged, but based on funding and resources they may not be prioritized as part of the Master Plan. It is recommended that airport sponsors

document the justification for not including elements as part of the Master Plan, as questions may arise later.

As an example, the Tampa International Airport (TPA) Master Plan Update Pre-Planning effort led to the development of multiple focus areas, two of which are included below:

- Prepare new airport activity projections taking into consideration the impact of the economic recession, consolidations in the airline industry and actions to enhance international service at TPA.
- Evaluate facility capacity with a specific focus on terminal and passenger processing facilities.

Understanding information and documentation that is still valid and what needs to be updated is essential in the scoping process. Each airport (and consultant project team) should develop the project purpose in a way that is most beneficial to the airport.

### Desired Outcome

An Airport Master Plan must establish desired outcomes and identify associated goals and objectives to provide overall direction. The desired outcome of a project is the long-term overall goal that the airport sponsor is trying to achieve through developing a Master Plan. The associated goals and objectives are the intermediate steps necessary to achieving the desired outcome. It is anticipated that the desired outcome and goals and objectives may be updated during the scoping process as well as during Master Plan development. The desired outcome should solidify an airport's role in the community and ensure the services being provided to the national airport system continue to be realized. For example, a *Tampa International Airport Master Plan Update* stated:

This "Master Plan Update was undertaken to take a refocused look at TPA with the emphasis on maximizing the capacity and longevity of the existing main terminal facilities while ensuring that the high level of service which TPA is known for is not diminished."

The desired outcome simply outlines what the airport sponsor wishes to achieve through the Master Plan process. Stakeholders and the airport sponsor should utilize previously completed work and information to ensure that the desired outcome is realistic and meets the needs of the airport identified within the project purpose.

### Goals and Objectives

Formulating project goals and objectives to achieve the desired outcome is the next step. Generally, part of scope development, a tiered goal framework is an important part of designing any planning study. Defining goals and objectives begins with the airport sponsor, FDOT, the FAA, and other stakeholders acknowledging key items associated with the purpose of the project and creating measurable steps to achieve them within the planning horizon. The goals are likely broad, long-term principles that the airport can accomplish to meet the needs established within the Purpose of the Project. Generally speaking, goals should represent realistic and ideal airport conditions. Once an airport sponsor has identified goals and established a framework, objectives should then be established. Objectives are specific, tangible, and short-term statements designed to achieve established goals. It is not uncommon to have multiple objectives for each goal.

Using this tiered approach, the airport sponsor has clear direction in which to utilize resources and move toward the desired future. The *Fort Lauderdale Executive Airport*

*Strategic Business Plan and Master Plan Update* developed seven goals. An example of one goal and the associated objective is:

#### Goal:

- Provide an airport that promotes safety as its most important objective

#### Associated Objective:

- Coordinate with the FAA, aviation industry, and legislative leaders to enhance safety training and standards to minimize runway incursions and aircraft accidents

The goals and objectives development process require a comprehensive understanding of the approximate effort and information desired from the master planning process. It is critical that the goals are realistic and feasible for the airport sponsor to implement.

### Budget

Establishing a budget estimate for the development of the Master Plan is one of the most important aspects of the scoping process. Typically, an Airport Master Plan scope weighs the needs and desires of the airport sponsor against any budgetary constraints. As such, the first stage of budgeting should be addressed by reviewing Pre-Planning. For airport sponsors that have not recently completed a Master Plan, estimating the budget can be difficult as costs and requirements change over time and prior planning budgets may not be relevant. Coordinating with FDOT and the FAA as well as airport peers regarding similar studies and budgets helps an airport sponsor account for current requirements and trends in master planning and provides a range within which to work. It is also recommended that a well-defined scope be developed prior to any budget submittals for pre-applications or other processes.

When developing a budget estimate, state and Federal compliance concerns should be given priority over other desired but not required components. Continually coordinating with the FAA and FDOT helps identify these components and ensure they are addressed appropriately. Where applicable, coordination with local governments that are assisting in funding will also be necessary. It is important to note that Federal planning grants cannot be amended to cover increased project costs. This emphasizes the significance of certifying that the estimated budget reflects the anticipated scope that is required and also certifying what is desired by the airport.

To support this process, close attention must be paid to the balance between scope, fees, and budget in order to set the stage for a successful study and allow the primary project stakeholders to develop a budget that meets all goals and objectives. Better planning at this phase will help to confirm that the scope is sufficient enough to complete the tasks that are required and desired by the airport as well as minimize deviation from the scope during implementation.

### Application for Federal and State Funding

#### Funding Process and Timeline

Another important step in the scoping process is applying for funding to develop the Master Plan. In Florida, project funding is programmed through the JACIP—a continuous process through which Florida public airports, the FAA, and FDOT program the airport capital improvement funds for both the FAA and the FDOT work programs. It is required that each public-use airport sponsor update the JACIP each year and whenever a Master Plan is approved. To formally secure project funding, the airport owner/sponsor must specifically request an appropriation through the JACIP process. Note that both the FAA and FDOT have adopted this mechanism as the official method by which funding requests for either agency are made. Complete instructions for using JACIP are available

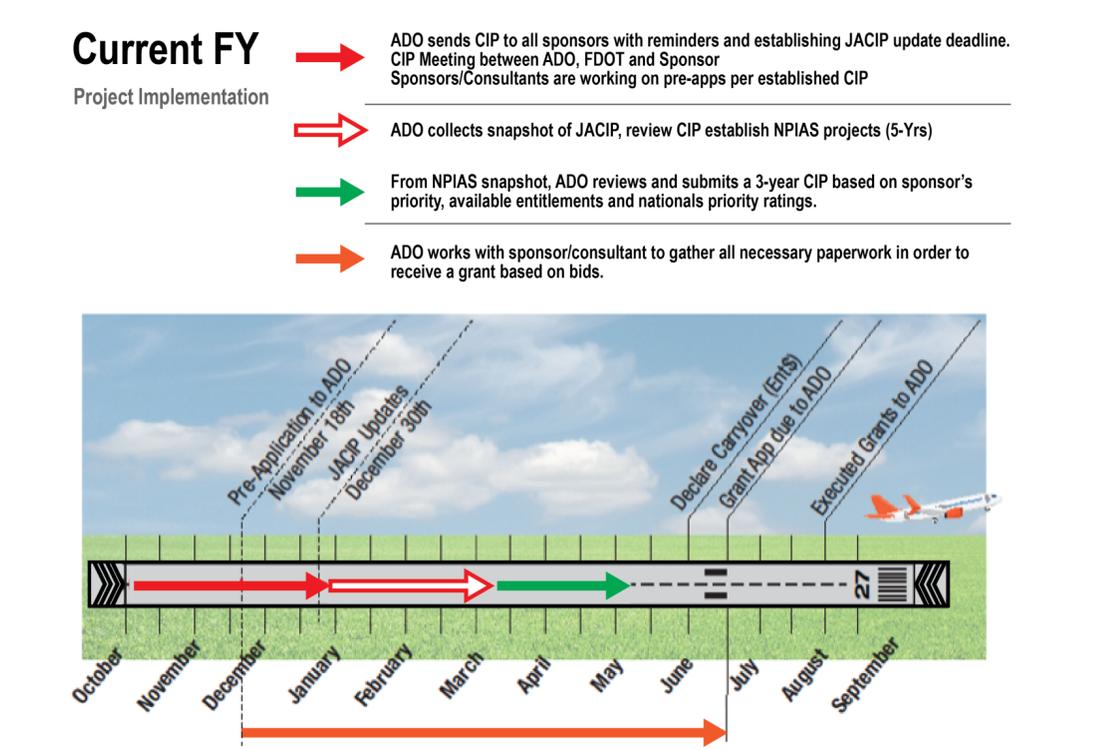
from FDOT and in Facilities Implementation section of this Guidebook. Airports pursuing funding from FDOT are encouraged to consult the most recent version of *The Florida Aviation Project Handbook*, found at the FDOT Aviation Office [Documents and Publication website](#).

### FAA Funding

The FAA AIP provides grants to public agencies and in some cases to private entities for the planning and development of public-use airports within the NPIAS. A public-use airport must meet current eligibility requirements for FAA funding. Airport sponsors should visit the [FAA Airport Improvement Program website](#) and review the [AIP Handbook - Order 5100.38D](#) to determine project eligibility for federal funding. An example of the FAA's funding process and timeline is provided in **Figure 4**. More detailed information on the process and scheduled of both FAA and FDOT funding is provided in Part 3, Section 10 Financial Feasibility Analysis of this Guidebook.

Per [FAA AC 150/5070-6B Airport Master Plans](#), the point at which a sponsor submits a Master Plan grant application to the FAA varies with the individual study; therefore, the FAA should be involved in the overall process as early as possible. The FAA can advise a sponsor on the best strategy for obtaining funding and assist with questions pertaining to eligibility of the elements included in the proposed scope of work.

**FIGURE 4. FAA PROJECT FUNDING SCHEDULES**



### FDOT Funding

The FDOT is able to provide an aviation grant program through [Section 332.003-332.007, F.S.](#) to airports that are publicly owned, and open for public use. Privately owned airports are not eligible to receive funding. These statutes allow the FDOT to provide grants to provide a safe, cost effective, and efficient statewide aviation

system. Financial assistance for Florida airports can be provided for those facilities that meet the criteria listed in the *Florida Aviation Project Handbook*. Other funding sources may be identified and applied for, but it is very likely each has a different process than the steps listed above.



**FDOT COMPLIANCE CHECKLIST ITEM!**

FDOT provides checklist items that must be completed *prior to receiving funding from FDOT*. These checklist items can be found in: **Appendix 4, FDOT Scope Review and Approval**

### Consultant Selection

Typically, airport owners/sponsors contract a consultant to perform the master planning study. The current version of **FAA AC 150/5100-14E, Architectural, Engineering and Planning Consultant Services for Airport Grant Projects**, as well as Section III of the Airport Consultant Council’s **Improving the Quality of Airport Projects: ACC/FAA Best Practices** both provide excellent guidance for consultant selection. Prior to undertaking the consultant selection process, it is recommended that the airport sponsor have a thorough understanding of the issues that led to developing a planning study and coordinate with the FAA and FDOT to ensure the AC is being followed properly. At this stage in the planning process, the airport should have the study’s goals and objectives clearly in place. This increases the efficiency of the scoping negotiations with the consultant. This information should be provided in the Request for Qualifications (RFQ) or Request for Proposal (RFP) that the airport sponsor ultimately issues.

### Scoping Process

#### Introduction

An accurate scope of work (SOW) can be established using the information gathered during the Needs Determination and Pre-Planning phases. This section provides detailed information on how each Master Plan element can be incorporated into the scope based on the needs of each airport. This section references information from the Needs Determination and Pre-Planning sections as well as the applicable Master Plan Elements chapter. The following sections outline how a unique scope should be developed to meet the needs of each airport.

FDOT Topic No: **725-040-100** provides the steps required during the project justification and scoping portion of a Master Plan.

#### Request for Qualifications/Proposals

While each airport and situation is unique, there is a basic framework of RFQs and RFPs to help ensure a successful plan is developed. The airport sponsor should assemble an unbiased team/panel to review and conduct consultant evaluations following a public advertisement of the RFQ or RFP. The qualifications of a submitting firm or team of firms should be judged on experience with similar work, staff professional credentials, and the ability to complete the study within the time specified. Research of the prospective consultant is highly recommended; ask to see similar master planning documents or

other work that may give some indication of the qualifications. Sponsors should also remember to adhere to any Disadvantaged Business Enterprise (DBE) requirements.

**Section 287.055, F.S.**, know as the **Consultant’s Competitive Negotiation Act (CCNA)** adopted by Florida Legislature in 1973, requires state government agencies and municipalities to select consulting firms based on qualification rather than on a “lowest” bid basis. The qualification-based selection can reduce cost escalations during the project and basis work on competence, track record, availability, and competitive wages.

When possible, the airport sponsor should keep the RFP/RFQ process as simple as possible. The more complex the process, the more the overall cost of the project increases for both the airport and any prospective consultants. The level of effort can be tailored for the size of the airport, the operating characteristics, the region, the available resources, and many other factors.

While a basic SOW should be developed, the RFQ/RFP process does not require a detailed SOW; the sponsor may request the consultant develop the SOW once selected. The RFQ/RFP may state the additional specific topics the airport would like to review such as sustainability, administration and planning policies, tenants and user leases, or additional assessments that need to be completed such as an energy or recycling audit.

Following the development of the SOW and prior to entering negotiations with a consultant, an Independent Fee Estimate (IFE) is required per Section 2.13 of **FAA AC 150/5100-14E, Architectural, Engineering and Planning Consultant Services for Airport Grant Projects**. Although the process for developing an IFE may vary based on the value of the scope and the airport sponsor’s familiarity with the scope, all contracts anticipated to be greater than \$100,000 require a detailed IFE, FAA **ARP SOP 11.00 Consultant Fee Analysis** provides additional guidance on performing a cost analysis to satisfy this requirement.

#### Airport Considerations

Each airport has different considerations and concerns that should be addressed through the master planning process, including issues and timing of planning efforts. Below is a description of these considerations.

##### Issues to Address:

- The Initial Needs Determination phase identified issues that airports face; these issues should be discussed with the FAA and FDOT during the Pre-Planning component. By accurately identifying these issues, airports can be confident an appropriate scope is being developed for the planning study.
- It is recommended that airports continue to coordinate with the FAA, FDOT, and other stakeholders throughout the master planning process to confirm the project is appropriately developed.



#### Timing of Previous Planning Efforts:

- As part of the scoping process, airports should be cognizant of existing available data, historical planning documentation, and other resources that may be available during the master planning process. In many cases, airports can use archived data from prior studies. It is important to gather this information and determine its relevance to the existing conditions of the airport or its desired outcome. Older planning studies may no longer accurately portray the current conditions at the airport but may indicate the types and level of information previously considered in the master planning process.
- Airports should also be looking to the future by identifying planning documents that could be developed during the master planning process. In some cases, an airport may have essential studies such as business plans, environmental documentation, or others that are out of date or are planned to be updated in the near future (less than five years) that should be considered for inclusion into the scope for the Master Plan (examples provided in **Part 1 – Master Plans: Setting the Stage**).

#### Project Considerations

Based on all the previous information collected, the airport can determine the appropriate type and level of analysis needed in each Master Plan element. As previously stated, the information below is explicitly linked to its corresponding Master Plan Work Element section. Where applicable, section references are made to provide users with concise, easy to use guidance.

This section covers the individual project considerations that each airport needs to identify during the scoping process, including the scale and intensity of individual Master Plan components. Additional information is also provided on compliance with FAA and FDOT grant assurances as well as utilizing **FAA Standard Operating Procedures (SOPs)**.

This section includes the following subsections:

- Grant Assurances
- Stakeholder and Public Involvement
- Data Availability
- Aviation Forecasts
- Environmental Considerations
- Airport Layout Plans
- SOP Checklists
- Schedules
- Manpower and Effort Requirements
- Deliverables

#### Grant Assurances

Both the FAA and FDOT have grant assurances that require the recipients to maintain and operate the facilities safely and efficiently and in accordance with specified conditions. Grant assurances must be followed when accepting funds from the respective agency. Below is an overview of the grant assurances provided by the FAA and FDOT related to master planning.

##### FAA Airports Grant Assurances

The FAA developed four sets of **federal grant assurances** related to airports to confirm safety and compliance with grant agreements. These include assurances on the **Aviation Block Grant Program, Airport Sponsors, Non-Airport Sponsors Undertaking Noise Compatibility Program Projects**, and **Planning Agency Sponsors** (a subsection of Airport Sponsors assurances). Since Florida does not participate in the Block Grant Program, assurances related to this are not appropriate or addressed. Additionally, for the purposes of this Guidebook, information from the Non-Airport

Sponsors Undertaking Noise Compatibility Program Projects grant assurances will also not be addressed.

Airports must comply with these FAA assurances that are automatically included in the grant agreement once an offer is accepted. As such, it is important to pay special consideration to these when developing the scope of a Master Plan.

Accepting funds is an agreement to comply with all applicable federal laws, regulations, executive orders, policies, guidelines, and requirements related to the grant agreement of the project. The terms of these grant agreements last throughout the useful life of the facilities developed but cannot be longer than 20 years from the date of acceptance of a grant offer of federal funds for the project. These assurances typically last 20 years, but their lifespan may depend on the type of recipient, useful life of the facility, and other conditions. Grant assurances are indefinite when federal funds are used to acquire land for the airport.

#### Grant Reminder!

Acceptance of grant assurances must be submitted as part of the project application (under the provisions of Title 49, U.S.C., Subtitle VII).

There are 39 assurances applicable under FAA grants, which include topics such as Federal legislation, construction inspection and approval, hazard removal and mitigation, and compatible land use. For airport master planning projects there are 12 assurances that apply per FAA's 'Airport Improvement Program Assurances for Airport Sponsors' document, unless otherwise stated in the grant agreement. These assurances can also be found in FAA's **Assurances - Planning Agency Sponsors** document; those related to airport master planning are as follows:

- |   |   |
|---|---|
| 1. General Federal Requirements                               | 18. Planning Projects                       |
| 2. Responsibility and Authority of the Sponsor                | 25. Airport Revenues                        |
| 3. Sponsor Fund Availability                                  | 30. Civil Rights                            |
| 5. Preserving Rights and Powers                               | 32. Engineering and Design Services         |
| 6. Consistency with Local Plans                               | 33. Foreign Market Restrictions             |
| 13. Accounting System, Audit, and Record Keeping Requirements | 34. Policies, Standards, and Specifications |

Under FAA's **Assurances - Planning Agency Sponsors**, sponsors, both public agency sponsors and private sponsors have the authority to apply for grants, finance projects, and implement projects. As stated previously, sponsors are required to comply with these 12 assurances while the project/program is receiving FAA assistance. A sponsor's responsibilities include ensuring consistency of a project with local plans and ensuring there is an accurate system for audit and recordkeeping. Moreover, a sponsor's duties in carrying out planning projects also include:

- Executing the project in accordance with the approved program
- Providing progress reports and annual or special financial and operation reports
- Providing documentation
- Managing public viewing of project documents

- Granting the Secretary power of staffing for consultants, subcontractors, and employees
- Preserving Rights and Powers

More information can be found on the [FAA grant assurances website](#).

#### Florida Specific Information!

FDOT Grant Assurances are provided in Exhibit 'E' of FDOT Public Transportation Grant Agreement Exhibits  
(Form No: 725-000-02)



#### FDOT Airport Grant Assurances

Similar to FAA's grant assurances, FDOT has released its own set of grant assurances named *Exhibit E Program Specific Terms and Conditions - Aviation Program Assurances* that are a part of all statewide aviation financial assistance agreements. These assurances are meant to protect airports and include the terms and conditions of FDOT's grant agreements,

which apply throughout the duration of the project and cannot be longer than 20 years (from the date of acceptance of the grant agreement); however, there is no limit on the duration regarding Exclusive Rights and Airport Revenue so long as the property is used as a public airport and with respect to real property acquired with funds provided by the State of Florida. The assurances applicable under FDOT grants include topics such as consistency with local government comprehensive plans, consistency with airport master plans and ALPs, airport financial plans, general airport planning projects, and land acquisition projects. Complying with these assurances also extends to property acquired with project funds, which are not subject to time limits.

The sponsor is responsible to certify the following for the grant agreement:

1. Holds a good title (Assurance #2)
2. Ensure safety of aerial approaches (Assurance #4)
3. Maintain an up-to-date ALP (Assurance #7)
4. Sufficient funds are available for costs not covered by grant (Assurance #8)
5. Revenue will be expended for airport and airport-related facilities' capital and/or operating costs (Assurance #9)
6. Airport availability under fair and reasonable terms (Assurance #12)
7. Compliance of regulation for management and operations (Assurance #14)
8. No exclusive rights (Assurance #17)

#### Stakeholder and Public Involvement

Just as every master planning effort is different, every public involvement effort must be tailored to the individual airport. It is the airport sponsor's responsibility to understand the public involvement requirements within the region, as well as FAA and FDOT guidance and requirements, as the minimums and expectations may vary. In most cases, the airport must, at a minimum, provide notice to the public regarding the plan and allow for comment on the plan's recommendations. Each airport should create a Public Involvement Program (PIP) to scale the public involvement efforts based upon the identified requirements, the complexity of the project, and the perceived demand for information. Less complex projects may only necessitate participation from the airport, the FAA, and FDOT, while larger or complex projects may require input from many different sources. Identifying the appropriate stakeholder involvement needs, level of effort, and time constraints within the scoping process is essential to a successful Master Plan.

To increase consistency with the stakeholder process, a PIP should be developed and incorporated into the scope. Airports must include a PIP within the master planning process to ensure compliance with grant assurances 6 through 9 of FAA's Airports Planning Agency Sponsors Assurances document.

Airports should reference FAA **AC 150/5050-4, Citizen Participation in Airport Planning** for guidance in public involvement with airport planning and the incorporation of a PIP. Florida airports should also understand FDOT's view on public involvement in FDOT **Topic No. 000-525-050, Public Involvement**, which recognizes the importance of PIPs and using outreach techniques adapted to the local conditions when providing transportation facilities.

It is recommended that, for public outreach, the scope should include at a minimum one coordination meeting with the sponsor, FAA, and local stakeholders such as City/Commission official(s), state officials, and Public Representative(s); and one public outreach meeting. In conjunction with the initial local coordination meeting and public outreach meeting, a PIP can be expanded to meet airport-specific needs and desires.

Information and examples on how to conduct meetings and the different types of meetings associated with Master Plans is discussed in detail within the **Stakeholder and Public Involvement Chapter of the Master Plan Work Elements section** (page 15).



## Existing Conditions and Data Availability

A successful master planning process must take into account the existing conditions and available data for the airport and its surroundings. The scoping process should address existing and available documentation, facilities inventory, conditions at the airport, and any recognized or known data deficiencies. The scoping document should acknowledge that the airport sits within a community and tailor the proposed planning efforts to meet the identified needs.

For more information on what should be included within master planning project regarding existing conditions, consult the Existing Conditions Chapter and FAA [AC 150/5070-6B, Airport Master Plans](#) which outlines typical existing conditions information that should be included and evaluated in the scoping for an Airport Master Plan. Generally, airports should scope for the collection and/or review of following existing information at a minimum:

- Inventory and Data Collection Process
- Airport History and Background
- Inventory Elements
- Airport and Surrounding Land Use
- Socioeconomic Data
- Aviation Activity
- Inventory of Financial Data

Airports with well-defined existing conditions information and documentation benefit from a reduced planning effort because much of this information can be referenced and noted in the scoping process and then ultimately used in the Master Plan.

If airport activity has been following the FAA Terminal Area Forecast (TAF), identified by the FAA to be within 10-percent in the five-year forecast period and 15-percent in the 10-year forecast period, new forecasts may not be needed unless significant demographic or economic changes in the community are anticipated. If substantial changes are anticipated that will change the forecast by 10-percent or more, approval will be required from the FAA.

## Forecasts

Per FAA [AC 150/5070-6B, Airport Master Plans](#), the short-term forecast (1 to 5 years) should support a capital improvement program, the intermediate-term (6 to 10 years) forecast should support a realistic assessment of needs, and the long-term (11 to 20 years) forecast should support a concept-oriented statement of needs in any forecast horizon. When developing aviation forecasts in the Master Plan, the airport should consider activities or data that may impact the specific forecasting needs. For example, if airport activity has been following the FAA Terminal Area Forecast (TAF), identified by the FAA to be within 10% in the five-year forecast period and 15% in the 10-year forecast period, new forecasts may not be needed unless significant demographic or economic changes in the community are anticipated. If substantial changes are anticipated that will change the forecast by 10-percent or more, approval will be required from the FAA. More information is provided in [Section 5 Aviation Forecasts](#) (page 31).

If the need for new forecasts is evident, these forecasts must be compared to the most recently published FAA TAF. Selecting appropriate forecast methods varies based on the needs of an individual airport. As stated in FAA [Order 5090.3C, Field Formulation](#)

## of the National Plan of Integrated Airport Systems (NPIAS), forecasts should be:

- Realistic
- Based on the latest available data
- Reflect the current conditions at the airport
- Supported by information in the study
- Provide an adequate justification for the airport planning and development

Individual airports should review the Aviation Forecast chapter to identify the intensity of the forecasting process that is needed accurately justify the recommendations of the Master Plan for purposes of appropriately scoping the forecast element. Additionally, identification of the critical aircraft is also an important part of the forecasting process. Approval of the critical aircraft is tied to the approval of the forecast. Therefore, it is important the scope also includes an existing and future critical aircraft analysis.

When scoping the forecast, it is suggested that the FAA's Office of Aviation Policy and Plans (APO-110), [Forecasting Aviation Activity by Airport](#), dated April 2001, be used to help determine what approaches to include within the scope. The [FAA Operations and Performance Data](#) website, provides some historical traffic counts, forecasts of aviation activity, and delay statistics, but not for all airports.

Forecasts are one of the two sections of a Master Plan that are reviewed by the FAA (with the second being the ALP). As such, sensitivity to the effort associated with responding to the multiple reviews and comments should also be included in the scope.

## Environmental Conditions

It is paramount to the success of master planning efforts that the environmental conditions and considerations are identified early and clearly within the scoping process. Potential environmental impacts related to development alternatives and potential permitting requirements should be thoroughly outlined within the project scope. It is important to note that in Change 2 of FAA [AC 150/5070-6B Airport Master Plans](#), environmental analyses are handled differently than in prior versions. Change 2 suggests including environmental conditions in the inventory section as well as throughout all sections of a Master Plan, not just as a stand-alone element. This will affect scoping since environmental conditions should not necessarily be a stand-alone chapter or element but should be woven throughout the master planning document in places such as inventory, alternatives, and possibly the implementation plan.

Airports are encouraged to review existing environmental studies and determine if the documentation is still representative of the conditions at the airport. It is important that airports include environmental-related provisions from the [FAA Modernization and Reform Act of 2012](#) within the scope, which outlines the recycling and waste management requirements at airports. Airports should be cognizant that some level of sustainability planning should be considered in the Master Plan document. Recycling and sustainability elements within a Master Plan should be coordinated with both the FAA and FDOT to ensure the necessary components are included in the scope and the budget.



When addressing existing environmental studies or considering creating additional documents, airports must understand the required process based on the funding source of their Master Plan. Federally-funded airports should consult the [National Environmental Policy Act \(NEPA\)](#), while state-funded master plans should consult the FDOT [Project Development and Environmental \(PD&E\) Manual](#). It should be noted that the FDOT PD&E guidance should only be used if the project is 100-percent state funded. When scoping a Master Plan, the airport sponsor should consult the FAA, FDOT, and local authorities to ensure that the applicable Federal, state, and local environmental policies are followed.

More in-depth information on environmental studies and the actions that may trigger the analysis is explained within the Environmental Considerations section (page 23) of **Part 3 – Master Plans: Product Development**.

## Airport Layout Plans

An ALP is a scaled drawing (or set of drawings), in paper and/or electronic form, that depicts the existing and proposed land and facilities necessary for the operation and development of an airport. The drawing(s) provides a graphic representation and tabular data of the existing conditions and long-term development plan for an airport. The ALP is a valuable tool for documenting and describing airport development needs. As such, it intended to be a living tool and should be updated with each infrastructure improvement that is implemented to accurately reflect current conditions.

Additionally, all airport development at federally-obligated airports must be done in accordance with an FAA-approved ALP. For a development project to be eligible for Federal AIP funding, that project must also be shown on an approved ALP. FAA approval of the ALP indicates that the existing facilities and proposed development depicted in the ALP conforms to FAA airport design and safety standards in effect at the time of the approval.

When scoping the preparation of an ALP, either as part of a Master Plan or an ALP Update, the airport sponsor, FDOT, and the FAA must come to agreement on the format, content, and level of detail to be included in the drawings. The FAA's [ARP Standard Operating Procedure 2.00](#) provides a description of the FAA and sponsor roles in preparing, reviewing, and approving an ALP. An important step in obtaining FAA approval is submitting the ALP into the [FAA Obstruction Evaluation/Airport Airspace Analysis \(OE/AAA\) website](#) in accordance with [ARP SOP 9.1 FAA Aeronautical Study, Coordination and Evaluation](#). ARP SOP 2.00 also provides a detailed checklist of mandatory and



optional items to be included in the drawings. This checklist should be used to help guide the scoping process.

#### Considerations when Scoping an ALP

- **If the ALP is being prepared independent of a master planning effort, what type of supporting narrative is to be provided?**
- **Which drawing sheets will be prepared?**
  - Required versus optional sheets
- **How should the drawing sheets be formatted?**
  - Are completely new drawings being prepared or are existing ones being updated?
    - If being updated, are the previous formats compatible with current software programs?
  - Will the sheets be prepared for electronic (eALP) or paper format (not particularly relevant currently, but may become more so when the FAA's eALP program is finalized)?
  - Though full eALPs are not yet a requirement, the FAA requires that new surveys be done to eALP standards, adding to the cost of the effort.
  - Color or black and white?
  - Sheet size – consider storage and production requirements.

- Does the ALP set need to coordinate with or link to any local municipality or sponsor CAD or GIS systems?
  - If so, what are the standards or format requirements?
- **What will be used as the base mapping for the drawing set and who will provide it?**
  - Will new or existing aerial mapping and photogrammetry be used?
  - Are there any recent as-built survey data that needs to be incorporated into the base mapping?
  - Do PACS and SACS need to be established at the airport?
- **Is an airspace obstruction analysis being performed?**
  - What are the data sources going to be?
    - If new aerial mapping and photogrammetry is being obtained, confirm adequate survey extents and time of year (e.g., leaves on versus leaves off), known obstacles, FAA digital obstacle file, recent flight checks, photo slope surveys, recent removal or lighting actions, etc.
  - What are the Airports GIS (AGIS) standards to be met and who will have access to the [FAA Obstruction Evaluation/Airport Airspace Analysis \(OE/AAA\) website](#) to upload data per [ARP SOP 9.1 FAA Aeronautical Study, Coordination and Evaluation?](#) (AGIS is further explained in the ALP section of Part 3–Master Plans: Product Development)
  - Is there any data in the FAA's [Surface Analysis Visualization \(SAV\) tool](#) that can be used?
- **Is a Property Map or Exhibit 'A' being prepared?**
  - An Exhibit 'A' is needed to support FAA-funded land acquisitions and is prepared to a higher level of detail and with additional information than a Property Map. Guidance contained in [FAA AC 150/5100-17, Land Acquisition and Relocation Assistance for Airport Improvement Program Assisted Projects](#) and [FAA SOP 3.00](#) should be used to scope the preparation of an Exhibit 'A' Property Inventory Map.
  - Is a boundary survey needed?
  - Is title and deed research needed?
  - Are there any navigation easements owned by the airport and where can that data be found?
  - Are there any encumbrances or right-of-way easements on airport property? Major utility easements, highway?
- **Are noise contours being developed for depiction on land use drawings?**
- **For the airport data tables, do Pavement Condition Numbers (PCN) need to be calculated? And if so, who is responsible for preparing them?**
  - PCN is required for Part 139 airports and for any runway work, at any airport, where that runway work is funded with AIP or PFC monies

- **What is the ALP review and submittal process going to be?**
  - Depending on the complexity, it is sometimes helpful to have an in-person work session with the FAA community planner and/or program manager to review the preliminary ALP draft prepared during the Master Plan.
  - Following meeting with the FAA and upon FAA and FDOT concurrence, will the drawing set be submitted in paper copies or uploaded to the FAA OE/AAA web portal for Lines of Business Review?
  - Will an airspace review be needed? If the ALP is only depicting as-built conditions, an airspace review and narrative report are not necessary ([SOP 2.00, Section 2](#)).
  - Determine the quantity and type (hard copies or electronic) of drawing sets to be produced and distributed at each submission point.

#### Schedules

Developing a realistic project schedule is significant as the schedule should establish deadlines for meeting planning process milestones and include timelines for completing technical products, conducting coordination efforts, and establishing formal and informal document review periods. An effective schedule should also clearly indicate decision points beyond which work should not proceed without airport owner/sponsor, FDOT and/or FAA approval, such as FAA review and approval of the Master Plan forecast.

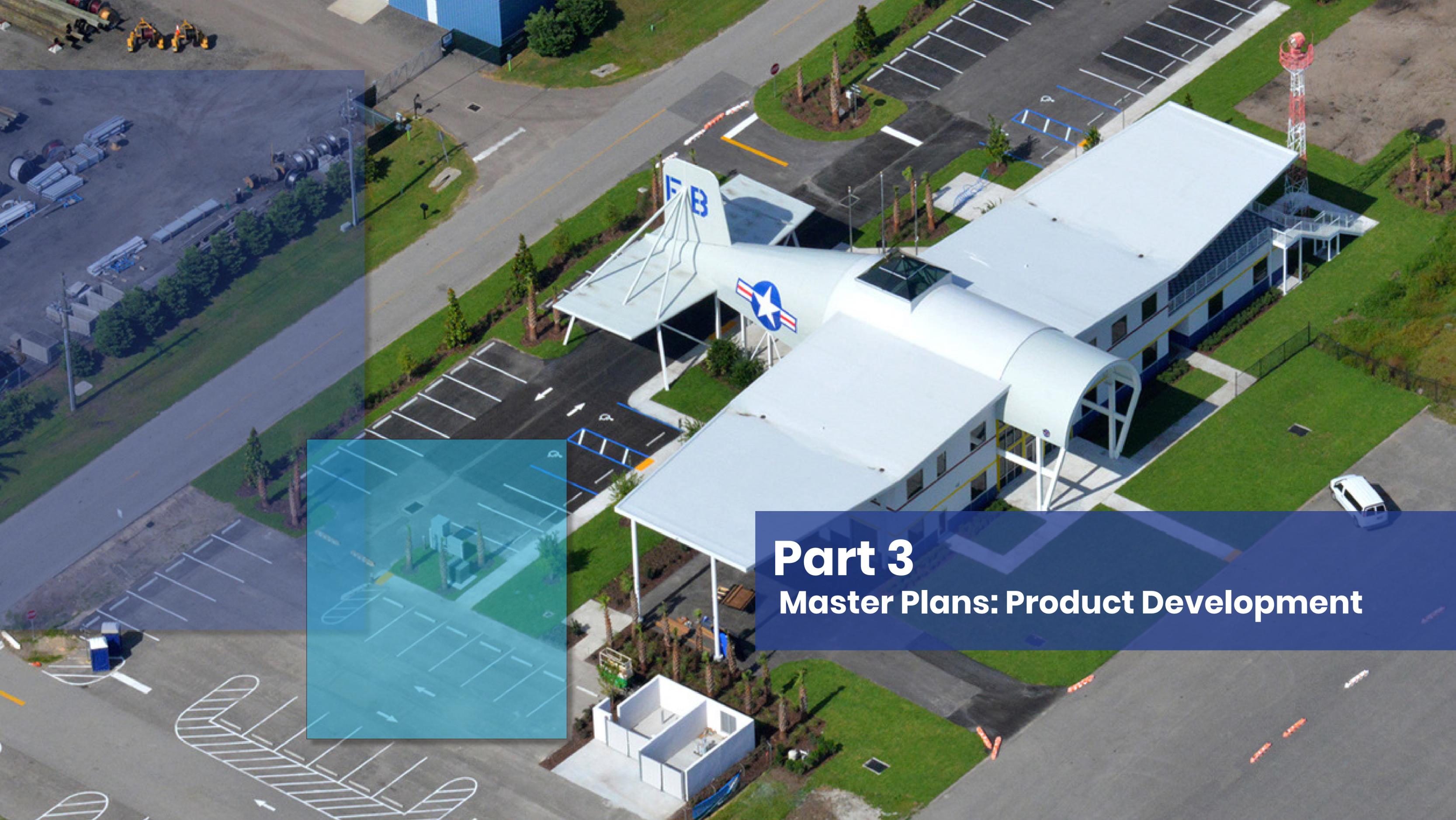
#### Deliverables

The project scope should specifically identify the draft and final work products of the master planning process. Additionally, the general level of detail should be described, including the number, type, and format of electronic and paper reports, drawings, and files. FAA [AC 150/5070-6B Airport Master Plans](#) highlights the following deliverables for the master planning process. The exact products developed vary based on the complexity of the needs at an airport; however, deliverables noted below should be considered:

- **Technical Report** – Contains the results of the analyses conducted during the development of the Master Plan.
- **Executive Summary** – Summarizes pertinent facts, conclusions and recommendations for public review.
- **ALP Drawing Set** – Contains a graphical representation of the proposed development in the Master Plan and is typically produced as a separate set of full-sized drawings.
- **Webpage** – public-access webpage with general information about the governmental unit involved and specific information regarding the airport or airports operated by the sponsor.

#### Summary

Ultimately, the scoping effort lays the foundation for successful Master Plan development. Integrating key stakeholders (FAA, FDOT, local interest groups) early in the process will help to ensure that Federal and state requirements are being followed and that the goals of the airport and community are being met. Utilizing the methodology described in this chapter will ultimately help the airport sponsor understand all of the issues that need to be addressed as part of their master plan study.



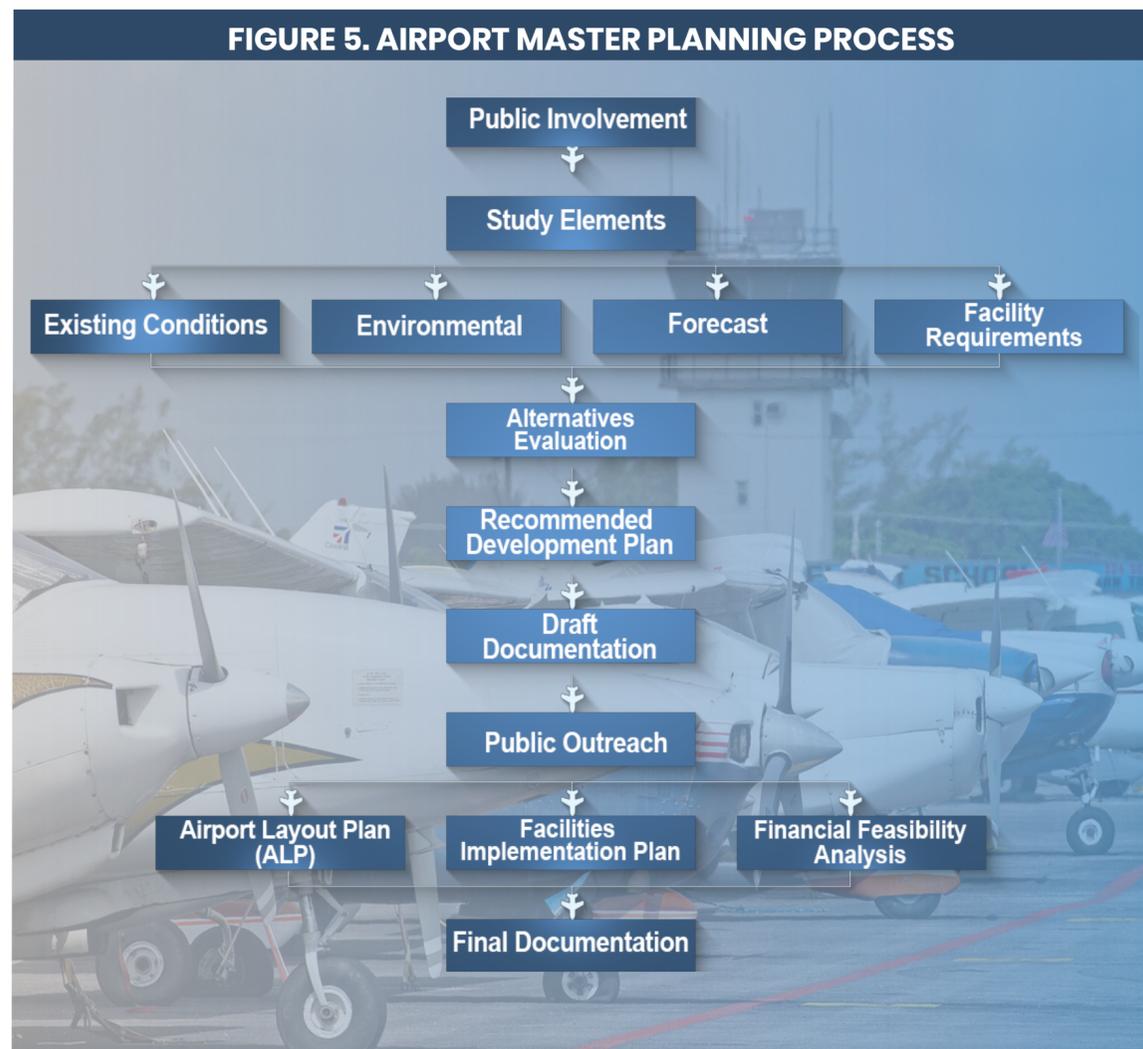
**Part 3**  
**Master Plans: Product Development**

### Master Plan Work Elements

This Master Plan Guidebook was developed to enhance *FAA AC 150/5070-6B, Airport Master Plans* by providing additional guidance and resources, including Florida-specific information. This Guidebook is a more singular reference for Florida airports conducting a Master Plan, because there are additional requirements of FDOT, State Statutes, Administrative Codes and other state agencies that are applicable to Florida airports beyond the FAA guidance.

Every airport's characteristics, issues, opportunities, and role are unique, so the traditional master planning elements, topics and complexity of the overall plan will vary. It is expected that each plan will be tailored to the specific circumstances of the airport, including any that may not be addressed in this Guidebook. The plan will provide more value to the future development of the airport and funding agencies if it elaborates on the specific challenges and opportunities the airport faces.

**Figure 5** illustrates the overall airport master planning process. It begins with determining what type of study is needed and involving interested parties, to conducting the research and analyses, obtaining stakeholder input, and developing the final documentation of the Report, ALP, and CIP. A summary of the Master Plan Work Elements included in this Guidebook is provided in the following paragraphs is discussed in detail in each associated section.



### Public Involvement Program (PIP)

A Public Involvement Program (PIP) is intended to encourage information sharing and collaboration between the airport sponsor and the stakeholders. This section introduces the key stakeholders, methods of public input, types of public involvement, as well as numerous other methods for properly implementing a PIP. It should be noted that the FAA requires some degree of public participation or input, but highly recommends a more robust program to obtain a greater understanding of the opportunities and constraints of the airport and support by the stakeholders.

### Environmental Considerations

Consideration of environmental factors in airport master planning helps the sponsor evaluate airport development alternatives and provides information that will help expedite subsequent environmental processing. This section introduces the requirements and standards related to both state and Federal environmental regulations and provides an overview of documenting and incorporating environmental analysis into the overall Master Plan. While the Master Plan is not intended to conduct the full NEPA or FDOT PD&E process, the information collected and analyses conducted during the Master Plan will identify and help expedite subsequent environmental processes, permits, and approvals that may be needed.

### Existing Conditions

One of the initial elements of an Airport Master Plan is a thorough inventory of existing airport conditions to establish the baseline for the study's analysis and recommendations. Identifying airside, landside, and surrounding airport facilities and their conditions is critical to evaluating facility requirements and opportunities based on existing and forecasted demand. This section discusses collecting and compiling the data of pertinent topics from various sources into a usable format for use in the planning process.

### Aviation Activity Forecasts

Forecasts are the basis for deciding what facilities will be needed in each timeframe. Thus, reliable forecasts are necessary to provide justification for the funding and development of new infrastructure and policies. Based on historical data collected in the inventory process, a baseline forecast for the 20-year planning horizon can be established. Planners apply the appropriate methodology to the baseline, compare to other forecasts for reasonableness, and submit the forecasts to the FAA for approval. This section introduces sources for aviation activity data and describes elements to be forecasted, methodologies, and documentation of the recommended forecasts.

### Facility Requirements

Facility requirements assess what additional facilities will be required beyond the existing airport infrastructure to accommodate forecasted aviation activity as well as to meet Federal, state, and local regulations, including FAA design standards, and incorporate impacts from emerging trends and stakeholder input. This analysis culminates in a summary of deficiencies and opportunities that is used to develop the recommended development plan. This section highlights the emerging trends that may impact the airport, Federal and state design standards that must be met, and resources to assist in the analysis.

### Development and Evaluation of Alternatives

The alternatives development and evaluation process identifies and describes alternatives for resolving the deficiencies identified in the facility requirements section. As there is typically more than one solution available, the alternatives must be evaluated to arrive at the most appropriate development recommendation. The ultimate goal of analyzing alternatives is to identify and evaluate all of the alternatives that are designed to meet the current and future needs of all airport users as well as keeping within the strategic vision of the airport sponsor. This section provides guidance on developing and evaluating the alternatives using specific criteria to determine the final recommended development plan.

### Airport Layout Plans

The ALP illustrates existing and proposed development at the airport. It is approved by the airport sponsor, FDOT, and the FAA. The ALP consists of a series of drawings, known as an ALP Drawing Set. It depicts existing and proposed airport facilities based on either a Master Plan's analysis of needs determined by reviewing the forecasts, facility requirements, and alternatives evaluation, or through other evaluations. This section reviews the drawings included in the drawing set and the approval process.

### Facilities Implementation Plan

A facilities implementation plan translates the recommended development plan into a series of projects that comprise the Capital Improvement Plan (CIP). Based on all of the information that is gathered throughout the life of the project, including considerations from the public as part of the stakeholder outreach process, the facilities implementation plan consolidates that information and identifies how and when projects will be completed. The complexity of the plan depends on the size, type, and role of airport. In some cases, a very simple plan capturing required items may be all that is needed, whereas other situations may call for a more detailed and comprehensive plan information. This section introduces the key steps in developing a CIP from gathering information on the individual projects to scheduling the projects to sharing the plan with funding sources to secure future funding.

### Financial Feasibility Analysis

The purpose of the financial feasibility task is to ensure the projects identified in the CIP can be implemented with anticipated funding. The financial feasibility analysis identifies funding sources based on the airport's financial position and role and provides a plan for funding projects in the short- and long-term. This step is important to ensure the CIP is realistic as it demonstrates an ability to fund the local share of the project. This section discusses potential funding sources and different types of analysis that may be completed to ensure the projects can be funded and add value to the airport.

### Final Documentation

The project scope should specifically identify the draft and final work products of the master planning process. The exact products developed varies based on the complexity of the needs at an airport, but it is recommended that deliverables include Working Papers, a Technical Report, Executive Summary, Airport Layout Plan Drawing Set, Webpage, and Public Information Kit.

### Purpose

Establishing a Public Involvement Program (PIP) within a Master Plan can be critical to the success of the planning process. In this context, the public refers to all individuals who have contact with or an interest in the airport and its functions, often referred to as stakeholders. The stakeholders may include tenants, employees, FDOT, the FAA, local governments, community members, and many other groups. It is anticipated that every airport will create a unique stakeholder list and PIP to meet their specific needs.

Regardless of the intensity of the public interest or the required level of participation, each airport should create a PIP as part of the Master Plan. Each PIP will address and include the public throughout the master planning process to involve the appropriate stakeholders. One critical element of an effective PIP is providing clear and concise information to the interested parties. In many instances, those affected by changes at an airport may have limited knowledge about airports and how airports operate (this is especially true for GA airports). In these instances, the PIP should focus on purposefully distributing information to these groups to provide an understanding of the goals and the processes of the Master Plan being developed.

### PIP Requirements

An airport's level of public involvement should strive to reflect the size of the airport and the community interest in the airport's Master Plan.

In FAA AC 150/5070-6B, *Airport Master Plans*, the FAA states:

*“Most planning studies will fall between the minimal requirements of a small airport study and extensive public involvement required of a large complex study. The FAA, the airport sponsor and the consultant may be the only participants as long as they coordinate with appropriate local officials, stakeholders, and ensure citizen participation through public information sessions.”*

FDOT also provides guidance on their prioritization of public involvement which is summarized in FDOT Topic No. 000-525-050, Public Involvement. It states:

*“The Department recognizes the importance of involving the public in information exchange when providing transportation facilities and services to best meet the state's transportation challenges. Therefore, it is the policy of the Florida Department of Transportation to promote public involvement opportunities and information exchange activities in all functional areas using various techniques adapted to local area condition and project requirements.”*

The anticipated level of public involvement needed for the project should be determined early in the planning process. However, regardless of the public involvement process selected, the process does not require a formal public hearing. A public hearing may be required during subsequent environmental studies.

### Grant Assurances

Upon accepting federal funds, an airport is obligated to a set of grant assurances, highlighted in the FAA document *Assurances: Airport Sponsors*. In total, there are 39 grant assurances with which airports must comply. Of these, three grant assurances are specifically related to stakeholder and public involvement; these are:

#### FAA Grant Assurances for Public Involvement

##### Grant Assurance #7 – Consideration of Local Interest

Ensures that the sponsor has given fair consideration of the communities in or near where the project may be located.

##### Grant Assurance #8 – Consultation with Users

Ensures that the sponsor, in making a decision to undertake any airport development project under Title 49, United States Code, has undertaken reasonable consultations with affected parties using the airport at which project is proposed.

##### Grant Assurance #9 – Public Hearings

In projects involving the location of an airport, an airport runway, or a major runway extension, it has afforded the opportunity for public hearings for the purpose of considering the economic, social, and environmental effects of the airport or runway location and its consistency with goals and objectives of such planning as has been carried out by the community and it shall, when requested by the Secretary, submit a copy of the transcript of such hearings to the Secretary.

More information on Grant Assurances can be found at: [www.faa.gov/airports/aip/grant\\_assurances/](http://www.faa.gov/airports/aip/grant_assurances/).

There are also 24 FDOT Aviation Program Assurances that are used as part of the Public Transportation Grant Agreements between FDOT and airports. Though none of FDOT's grant assurances are specifically related to public involvement, they do cover topics including materials available for public review and public open access to governmental proceedings.

### Florida Sunshine Law

Florida Statutes Chapter 286.011, *Public Meetings and Records; Public Inspection; Criminal and Civil Penalties*—commonly known as the “Florida Sunshine Law”—is an important component of the Master Plan PIP. The “Florida Sunshine Law” states:

*“All meetings of any board or commission of any state agency or authority or of any agency or authority of any county, municipal corporation, or political subdivision, except as otherwise provided in the Constitution, including meetings with or attended by any person elected to such board or commission, but who has not yet taken office, at which official acts are to be taken are declared to be public meetings open to the public at all times, and no resolution, rule, or formal action shall be considered binding except as taken or made at such meeting. The board or commission must provide reasonable notice of all such meetings.”*

The Sunshine Law is one of the most expansive public records laws in the U.S. Since public-use airports in Florida are typically owned and/or operated by city or county governments or by airport authorities created under statutes of the state, airport meetings are subject to the “Florida Sunshine Law.” As such, any gathering—whether formal or casual—of two or more members of the same public or governmental entity where they discuss a subject that could reasonably be considered to come before that entity for action is considered to be a meeting.

Most meetings conducted as part of a Master Plan PIP are subject to the provisions of the statute because they are advisory in nature. If the committees were only to conduct fact-finding activities including gathering and reporting information, they would be exempt. If the planning team is asking for opinions and soliciting advice during meetings, the “Florida Sunshine Law” applies.

Public agencies are also permitted to adopt reasonable procedures with respect to the orderly conduct of public meetings. For example, agencies are allowed to restrict the amount of time each individual speaks. When there are many people wishing to speak, the agency is allowed to request that a representative from each side speak rather than everyone present. More information on the “Florida Sunshine Law” can be found at: [www.leg.state.fl.us/statutes/](http://www.leg.state.fl.us/statutes/).

### Types of Public Involvement

A Public Involvement Process (PIP) can be simple or complex, usually depending on the size of the airport and the interest of the community. Simple programs can even take the form of a webpage on an airport website that keeps the community informed. Although this simple form of public involvement doesn't involve face-to-face interaction, it is vital that the webpage provides ample information and allows for the public to comment and discuss. More complex PIPs can involve multiple committees and hired consultants to address the public. A schedule of public meetings to inform the community and facilitate open discussion is recommended for more complex plans. Large public involvement forums and meetings can take place at other public venues such as transportation plan updates or other meetings.

An airport should determine how extensive a PIP needs to be based on the airport size, scope of change, and anticipated public interest. However, all plans should provide stakeholders with adequate opportunities to provide input. Of importance for this process is determining the ways in which information will be both distributed and received as part of this process. Understanding how the information will flow between an airport, the public, and interested parties will help when determining the type of PIP necessary for a project.

### PIP Timing

The PIP should be integrated and initiated in the master planning process as early as possible. Early involvement helps identify key concerns and enhances communication between the public and the planning team, which can improve the focus and, ultimately, results of the master planning process. Many airports are vital to the communities in which they are located, and the public may distrust the planning team, the plan's results, and the airport if not actively invited to or involved in the process. Though it is

### Florida Specific Information!



Since public-use airports in Florida are typically owned and/or operated by city or county governments or by airport authorities created under statutes of the state, airport meetings are subject to the “Florida Sunshine Law.”

unlikely that every concern voiced will be eliminated, obtaining input from the public before recommendations are developed affords the planning team the opportunity to mitigate the concerns, garner broader support, and develop a more successful project.



### Stakeholder Identification

Each airport will have its own list of stakeholders and the involvement will vary based on the scale of project being conducted. Below is a list of typical stakeholder representatives that may be involved within the airport master planning process:

- Airport Sponsor Agency (each sponsor must be a public agency and meet the requirements of 14 CFR 152.103[a][3])
- FDOT personnel (any FDOT personnel authorized to review, comment, and implement Airport Master Plan development through the aviation work program)
- FAA personnel (any FAA employee with insight into AC 150/5070-6B)
- Air Traffic Control tower staff
- Interested groups (any group interested in the Airport Master Plan, ex: homeowner associations, developers, tourism boards, etc.)
- Resource agencies (Transportation Security Administration, elected officials, etc.)
- Metropolitan Planning Organizations
- Economic development agencies
- Local agencies (Public Works Department, Planning Department, etc.)
- Users and tenants
- General public

Each master planning project will have different issues to address and therefore needs to engage different stakeholder groups. It should be noted that additional stakeholder groups should be included throughout the planning process as they are identified.

Stakeholders should understand that their participation in the planning process is advisory in nature and that their involvement does not mean they have decision-making authority. It is the airport sponsor and planning team's responsibility to ensure the appropriate message is conveyed at the beginning of the PIP and throughout the study as necessary.

### Role and Purpose of Stakeholder and Public Involvement

#### Identification of Issues

One of the most important outcomes of a PIP is the development and identification of key issues affecting the airport and its stakeholders. The public should be made aware of the anticipated direction and ultimate goal of the Master Plan early in the master planning process. Using the methods, tools, and techniques identified in the Methods and Techniques for Stakeholder Involvement and Tools for PIP Communication sections will help the project team understand how the proposed Master Plan will affect the public. The concerns that the public voice early in the process will ultimately help determine policy decisions, influence technical criteria and standards, and help identify alternatives. An effective PIP program will help create an airport master planning project that meets the needs of the airport and its stakeholders.

#### Review and Comments

When appropriate, stakeholders should be afforded the opportunity to review and comment on Master Plan deliverables. Since this may lead to additional work for the project team, a clear understanding of how the comments will be addressed must be noted during the scoping process. Giving stakeholders this review opportunity ensures the conditions are accurately portrayed and provide meaningful and understandable results. Identifying potential solutions and corrections that are realistic for the airport should remain a primary focus of the review. Comments allow stakeholders to present their issues or ideas that the airport should strive to address.

#### Application to Other Master Plan Elements

The PIP process, when implemented effectively, provides insight regarding the issues and concerns of the affected community. The information obtained as part of the PIP process should then be considered in the development of the facility requirements and alternatives development elements. It is likely that as the project progresses, new information will arise that causes the alternatives development process to refine and reprioritize some of the elements. Allowing for development to be an iterative process will ultimately provide more flexibility to the project team when developing the Master Plan.

### Methods and Techniques for Stakeholder and Public Involvement

There are various methods to employ when distributing and receiving input from the public. The method used will depend on how interested the public is in the Master Plan, the practices and policies of the airport sponsor, the complexity of the Master Plan, and the budget. A balance must be struck between the need for public involvement and the costs associated with the process. Complex master plans may necessitate larger stakeholder groups, but it is important to ensure the discussions remain focused and meaningful. All public meetings should be held in a manner consistent with Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority and Low-Income Populations*. This Order requires each Federal agency to identify and address "the disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations." A selection of tools and techniques that can be used during a Master Plan are discussed on the following sections.

### Committees

The two most common forms of committees formed as a part of a Master Plan are a Technical Advisory Committee (TAC) and a Citizens Advisory Committee (CAC). Depending on the size and complexity of the Master Plan, it may be beneficial to combine the committees into a single group. The roles of each of the committees should be clearly defined and carefully explained at the beginning of the program.

- **Technical Advisory Committee:** Will review and advise on the technical merit of the Master Plan and verify technical accuracy of documentation. Comprises:
  - Stakeholders with a high level of technical knowledge about airports and airport operations
  - Review documents for technical accuracy
  - Major stakeholders in the airport's operation
- **Citizens Advisory Committee:** Bring a consensus of opinion from their respective constituencies to the Master Plan project team and ensure public concerns are considered and addressed. Comprises:
  - Stakeholders who can interact with the planning team and take information back to their constituents
  - Review documents to ensure public concerns are considered and addressed
  - Representatives from all stakeholders

### Public Information Meetings

There are several types of public information meetings that can be implemented into a master planning process. An "open house" and the "formal public hearing" are two of the more popular choices, along with workshops.

- **Open House:** Informal events that provide the public with an opportunity to interact with airport staff, ask questions, and offer comments on the plan in a more informal setting
  - Airport should provide relevant information, maps, and data
- **Formal Public Hearing:** Formal events held specifically to obtain public testimony or comment on a proposed action or decision
  - Held to obtain input on a variety of proposed actions including environmental impact statements, permits, plans, and proposals
  - Hearing is recorded and an official transcript of the meeting is made publicly available
  - Not mandatory in a Master Plan, but should be considered for more complex plans
- **Workshops:** Include a small group of stakeholders and addresses a narrowly-defined topic
  - Usually short and task-focused

For additional information on public involvement techniques, refer to the Federal Highway Administration's (FHWA's) Public Involvement Techniques for Transportation Decision-Making website.

### Meeting Organization

Meetings can be organized in a myriad of ways and may include some of the following techniques:

- **Visioning:** This process allows the group to develop long-term goals for the planning process and identify how airports should address those goals. This step usually occurs at the beginning of the Master Plan study.
- **Brainstorming:** This allows the group to generate ideas and identify issues within the planning process. This technique is an effective tool for reducing conflict and allows multiple groups to share their opinions. This technique should be implemented in various stages of the master planning process including—but not limited to—alternatives, funding, and implementation strategies.
- **Facilitation:** Regardless of the meeting method selected, having a facilitator present is critical to ensuring all groups have their opinions heard and keeping the meeting on time.

### Tools for PIP Communication

#### Communication Methods

When possible, the planning team should use alternative communication methods to ensure stakeholders have an opportunity to participate in the planning process. Some examples of communication methods include:

- **Computer Presentation:** Display data, images, and in some cases allow for interactive experiences
- **Interactive Television:** Using a cable service to reach meeting members
- **Information Gathering Survey:** Both online and paper alternatives
- **Live Polling:** Surveys held during stakeholder meetings offer near instant data gathering
- **Teleconferencing/Video Conferencing:** Can reach stakeholders unable to meet face-to-face
- **Visualization:** Includes mapping exercises, visual preference surveys, and 3D visualization
- **Newsletters:** Provide summary information to stakeholders unable to attend meetings
- **Websites/Social Media:** Reaches a different demographic of the public and allows for efficient feedback, allows for more frequent updates to information



### Distribution of Information

Information should be distributed throughout the airport master planning process to disclose findings to those directly involved in the master planning process and those interested in learning about the project. Stakeholders should be given the opportunity to provide their contact information so they may receive projects updates. Typical methods of information distribution include:

Printed Materials	Webpage	Social Media
<ul style="list-style-type: none"> <li>• Pamphlets, brochures, information packets, press releases, newspaper articles and advertisements, and general information packets</li> <li>• Can be made available at the airport as well as at local governmental offices</li> </ul>	<ul style="list-style-type: none"> <li>• Provides citizens with information on upcoming meetings as well as draft deliverables</li> <li>• Provides a method for distributing information to a large number of people</li> <li>• Can be included as an additional page on the airport/municipal website</li> <li>• Can be developed as a stand-alone page dedicated to the Master Plan (Ex: Wordpress.com)</li> <li>• Can include electronic access to any or all printed materials for greater accessibility</li> </ul>	<ul style="list-style-type: none"> <li>• Facebook™, Twitter™, and Instagram™ accounts can be used to provide information about the planning process and meeting times</li> <li>• Social media can also allow for constant public input that the project team may address</li> </ul>

### Challenges of Communication

One of the challenges of effectively communicating with stakeholders is the complex nature of airports and airport operations. In many instances, the public is not familiar with how an airport functions or even what role an airport plays in a community. Therefore, as part of any successful PIP, complex technical components of the Master Plan must be presented in a way that individuals or groups who are unfamiliar with airports can

understand. In many instances, the best way to distribute this information is through small group or one-on-one meetings with established members of the community. This allows the information to come from a trusted source and may make concerned parties more open to the process. Below are examples of ways to communicate technical information to the public effectively:

- **Use the TAC and CAC to distribute important information**
  - The TAC and CAC are likely to be integrated with the local community and should understand the different groups and entities that may be a challenge to communicate with. Utilizing their knowledge of the issues that are important to the community will allow the PIP to be developed so that pertinent information can be distributed based on the interests of different groups
- **Meet with leaders of community groups**
  - Meeting with community leaders allow their constituents to be able to hear information from people they are familiar with and trust. If it is anticipated that members of the community will be opposed to certain airport development, scheduling meetings with the leaders of those communities provides an opportunity to distribute information at a smaller scale and allows for the information to be distributed back to the community from people they are familiar with. Holding these meetings early in the process will allow the concerns of the community to be incorporated into the Master Plan and will also increase the trust the community has in the master planning process
- **Meet with key stakeholders**
  - If it is likely that a group is going to oppose any portion of a Master Plan, meeting with them early in the process and getting their input will help in the group feeling that their concerns are being heard. Once the concerns are documented, alternatives can be developed, to the extent feasible, that will accommodate and mitigate the components of the Master Plan that they oppose.

### Documentation of PIP in Master Plan

#### Key Issues

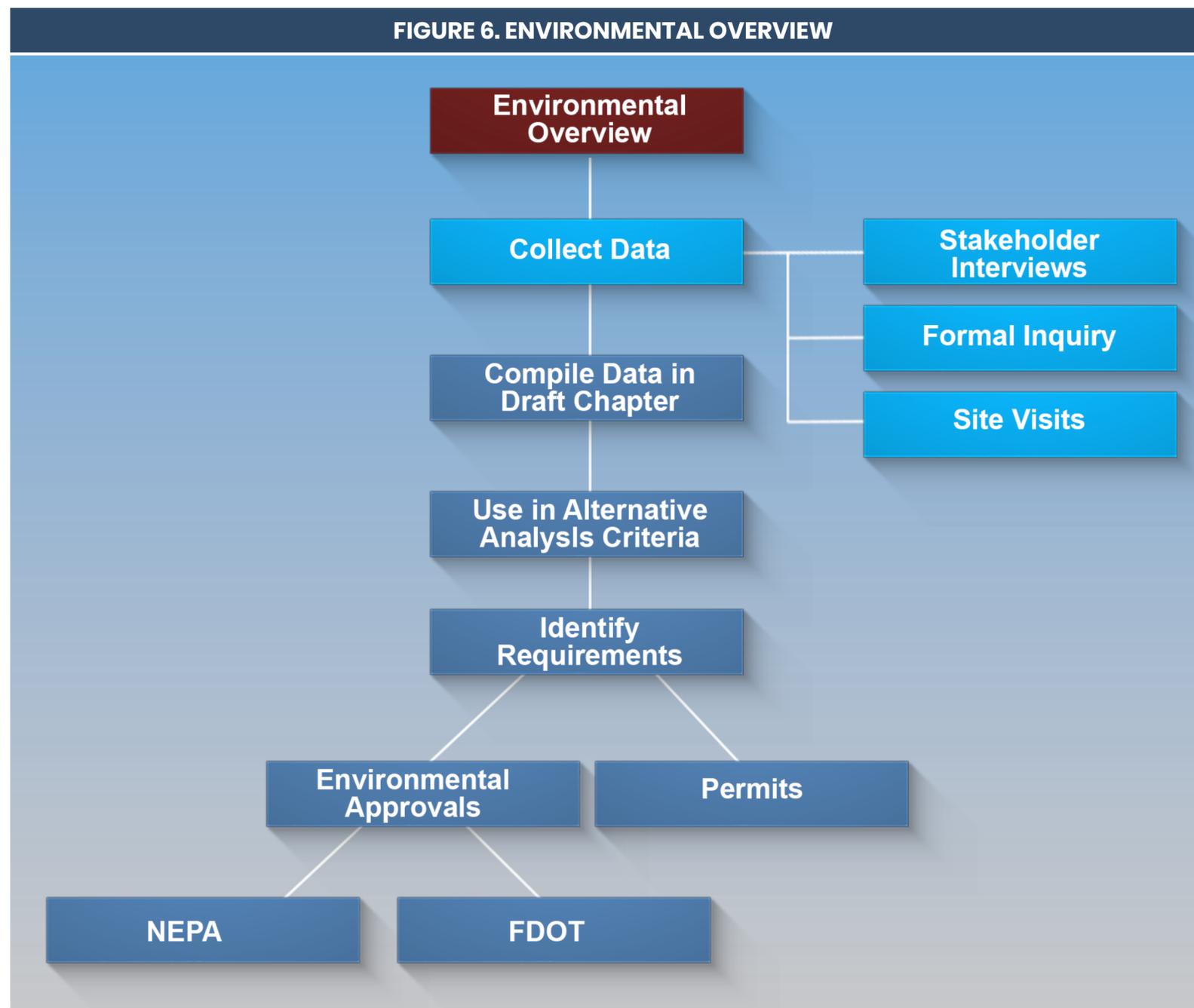
As mentioned above, stakeholder groups and public meetings should be utilized early and often in the master planning process to ensure all issues are identified and mitigated, to the extent feasible. Key issues addressed during the master planning process should be presented to the public in a manner that is clear and accessible. The information gathered throughout the planning process should be thoughtfully and thoroughly documented within the PIP so that those who participate are able to see their input reflected in the plan.

#### PIP

The PIP should be documented within the appendix of the completed Master Plan document. This should include—but is not limited to—meeting minutes, committee lists, flyers, newsletters, and advertisements used during the PIP. The appendix will then serve as the official record of the PIP throughout the planning process.

An important element of an Airport Master Plan is identifying and documenting environmental issues that can affect existing airport facilities as well as proposed short- and long-term developments. These considerations are important because state and federal requirements can play a major role in how these issues are addressed or considered. As shown in **Figure 6**, environmental considerations must be identified and assessed to help the airport sponsor thoroughly evaluate development alternatives and expedite subsequent environmental processing. Of importance is understanding the differences in environmental processes for projects that are funded by the FAA or FDOT. Both of these processes are further described in this section. Another important consideration is that any environmental considerations identified during the master planning process should set the stage for future state and Federal environmental processes that may be needed. It is not the intent of the Master Plan to include the full NEPA or FDOT PD&E process; rather, the information collected during the Master Plan should identify and set the stage for understanding what future environmental processes may be needed.

**FIGURE 6. ENVIRONMENTAL OVERVIEW**



Prior to beginning an Airport Master Plan, it is important for the airport (and its consultant) to understand what environmental issues may be present at an airport. To the extent feasible, this information should be understood during the scoping and budgeting process to ensure that the Master Plan budget allows for the proper environmental analysis to be completed. In the event that the environmental analysis outgrows the context of the master planning scope, a more detailed environmental study may be required for the airport. Understanding the environmental issues that are present at an airport early in the master planning process will help to ensure that proper emphasis is given to documenting environmental issues.

Utilizing existing maps of the airport area, available documents, aerial photography and online resources, planners can establish a general overview of sensitive environmental resources both on and around the airport. Areas within the Master Plan that benefit from the inclusion of environmental considerations include:

- An inventory (overview) of the airport’s environmental setting
- Potential environmental impacts of airport development alternatives
- Environmentally-related permits that may be required for recommended development projects

The importance of environmental planning to the FAA is highlighted in AC 150/5070-6B, which recommends the master planning process consider the needs of subsequent environmental review processes:

*“The master plan should include thoroughly supported project justifications and thorough documentation of alternatives that meet the planning need and are reasonable and feasible (environmentally as well as technically); and should note any effects of the airport development alternatives on sensitive environmental resources.”*

In the past, Airport Master Plans typically provided a general environmental overview as a stand-alone component of—or subsequent to—an alternatives analysis. Due to the sensitivities and limitations to potential airport developments, the FAA now recommends that planners develop each chapter of the Master Plan with environmental considerations in mind and incorporate them into the appropriate chapters, such as existing conditions and alternatives development and evaluation.

Understanding the environmental issues that are present at an airport early in the master planning process will help to ensure that proper emphasis is given to documenting environmental issues.

Five primary resources to utilize when examining environmental considerations for Airport Master Plans are provided below.

### Environmental Considerations Resources

#### FAA Order 1050.1F, Environmental Impacts: Policies and Procedures

- Should be examined to ensure compliance with NEPA and regulations issued by the Council on Environmental Quality (CEQ). The requirements in this Order apply to, but are not limited to, Federal actions such as grants, loans, contracts, leases, construction and installation actions, procedural actions, research activities, rule making and regulatory actions, certifications, licensing, permits, plans submitted to the FAA by state and local agencies for approval, and legislation proposed by the FAA.

#### FAA Order 5050.4B, National Environmental Policy Act (NEPA) Implementing Instructions for Airport Actions

- This document is a companion to Order 1050.1F and should be consulted as a guide to help planners identify potential environmental impacts specific to the study airport that should be considered as planning continues. Note: this order is currently being updated to incorporate the changes to FAA Order 1050.1F from version 1050.1E.

#### FDOT Project Development and Environment (PD&E) Manual – Non-Federal Projects

- This chapter of the manual should be referenced for any project that receives no federal funding. This manual defines the type of documentation required for non-Federal projects, including State Environmental Impact Reports (SEIR), Non-Major State Actions (NMSA), and projects without FDOT involvement. It should be noted, however, that a PD&E is not sufficient for a project that is state-funded but that has a Federal action (such as ALP approval) included. In this instance, the NEPA process would be required.

#### FDOT Project Development and Environment (PD&E) Manual – State, Local, or Privately Funded Project Delivery

- A Project Environmental Impact Report (PEIR) is the supporting environment documentation for local and privately funded projects constructed on FDOT Right-of-Way (ROW). Although the PEIR is not an FDOT document, it is prepared using the same procedures and requirements of a State Environmental Impact Report (SEIR).

#### Florida Statutes (F.S.)

- These are the codified statutory laws of Florida. Statutes are updated annually after the conclusion of a regular legislative session.

environmental requirements (Categorical Exclusion [CATEX], Environmental Assessment [EA], and Environmental Impact Statement [EIS]) as a result of recommended alternative developments.

The Environmental Overview should document environmental conditions that should be considered when identifying and analyzing airport development alternatives. Per FAA Order 5050.4B, National Environmental Policy Act (NEPA) Implementing Instructions for Airport Actions and FAA Order 1050.1F, Environmental Impacts: Policies and Procedures, the environmental categories shown in **Table 6** should be reviewed as part of the Environmental Overview.

Environmental Categories	
Air quality	Biological resources (including fish, wildlife, and plants)
Climate	Coastal resources
Department of Transportation Act, Section 4(f)	Farmlands
Hazardous materials, solid waste, and pollution prevention	Historical, architectural, archaeological, and cultural resources
Land use	Natural resources and energy supply
Noise and noise-compatible land use	Socioeconomics, environmental justice, and children's environmental health and safety risks
Visual effects (including light emissions)	Water resources (including wetlands, floodplains, surface waters, groundwater, and wild and scenic rivers)

Source: Adapted from FAA Order 5050.4B, National Environmental Policy Act (NEPA) Implementing Instructions for Airport Actions and FAA Order 1050.1F, Environmental Impacts: Policies and Procedures

#### NEPA Process

Once a preferred development alternative has been identified and proper environmental documentation for that alternative has been provided, the FAA must complete its project approval process. Specific components of the proposed alternative for a project with a Federal action will require additional environmental review in the form of a CATEX, EA, or EIS.

*The NEPA process is not intended to be completed as part of a Master Plan study, this information is intended solely to provide an overview of the process.*

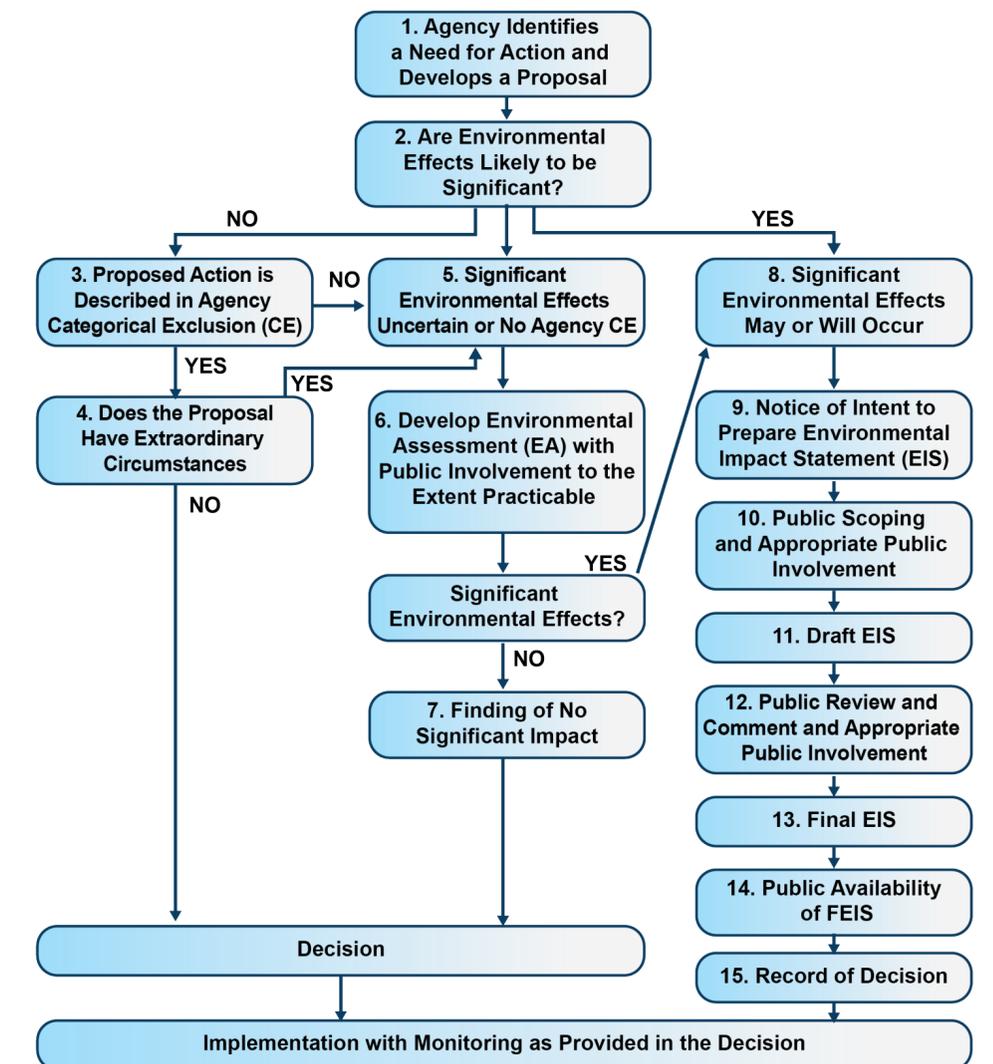
A CATEX is required when a Federal action may be "categorically excluded" from a detailed environmental analysis. See Chapter 5, Paragraph 5-6 of Order 1050.1F for the descriptions of FAA's categorically excluded actions. This level of environmental analysis is needed if the action (preferred development alternative) does not individually or cumulatively have a significant effect on the human environment.

Effective June 2017, SOP 5.1 provides clear instruction to FAA employee on how to appropriately document a CATEX and clarifies the circumstances a CATEX may be appropriate.

*Federal NEPA approval is a required item with a grant application.*

The FAA may determine that a CATEX does not apply for specific components of a preferred alternative. In that case, an EA may be required. An EA determines whether or not the proposed alternative has the potential to cause significant environmental effects (see Chapter 6 of Order 1050.1F). If the FAA determines the proposed alternative will significantly affect the quality of the human environment at or near an airport, an EIS may be required. The regulatory requirements for an EIS are more detailed and rigorous than those of an EA (see Chapter 7 of Order 1050.1F). A graphical representation of the NEPA study determination process is shown in **Figure 7**.

**FIGURE 7. THE NEPA PROCESS**



### Federal and State Environmental Processes

#### FAA Guidance

FAA Orders 1050.1F and 5050.4B provide information for fulfilling NEPA and CEQ requirements for airport actions under the FAA's authority. For the purposes of an Airport Master Plan and the development of airport alternatives, it is not necessary to document environmental considerations to the extent identified in the NEPA process. However, the environmental categories outlined in FAA Orders 1050.1F and 5050.4B should be examined and documented in the Master Plan as a precursor to any subsequent NEPA

## State Guidance

The FDOT PD&E Manual is divided into two parts: Part 1: Process and Guidelines, and, Part 2: Analysis and Documentation. Both parts can be useful and should be referenced in the Environmental Considerations section of a Master Plan. The Non-Federal Projects chapter (found in Part 1) provides the information for fulfilling non-federal project requirements under FDOT's authority. For the purposes of an Airport Master Plan and the development of airport alternatives, it is not necessary to document environmental considerations to the extent identified in the PD&E Manual – Non-federal projects process. However, the environmental categories outlined should be examined and documented in the Master Plan as a precursor to any subsequent environmental requirements such as A Non-Major State Action (NMSA) checklist, State Environmental Impact Report (SEIR), or Projects without FDOT involvement. Other sections of the FDOT PD&E Manual should be referenced in the environmental considerations portion of a Master Plan including Part 1 Chapter 6: Environmental Assessment.

## State Environmental Requirements for Non-NPIAS Airports

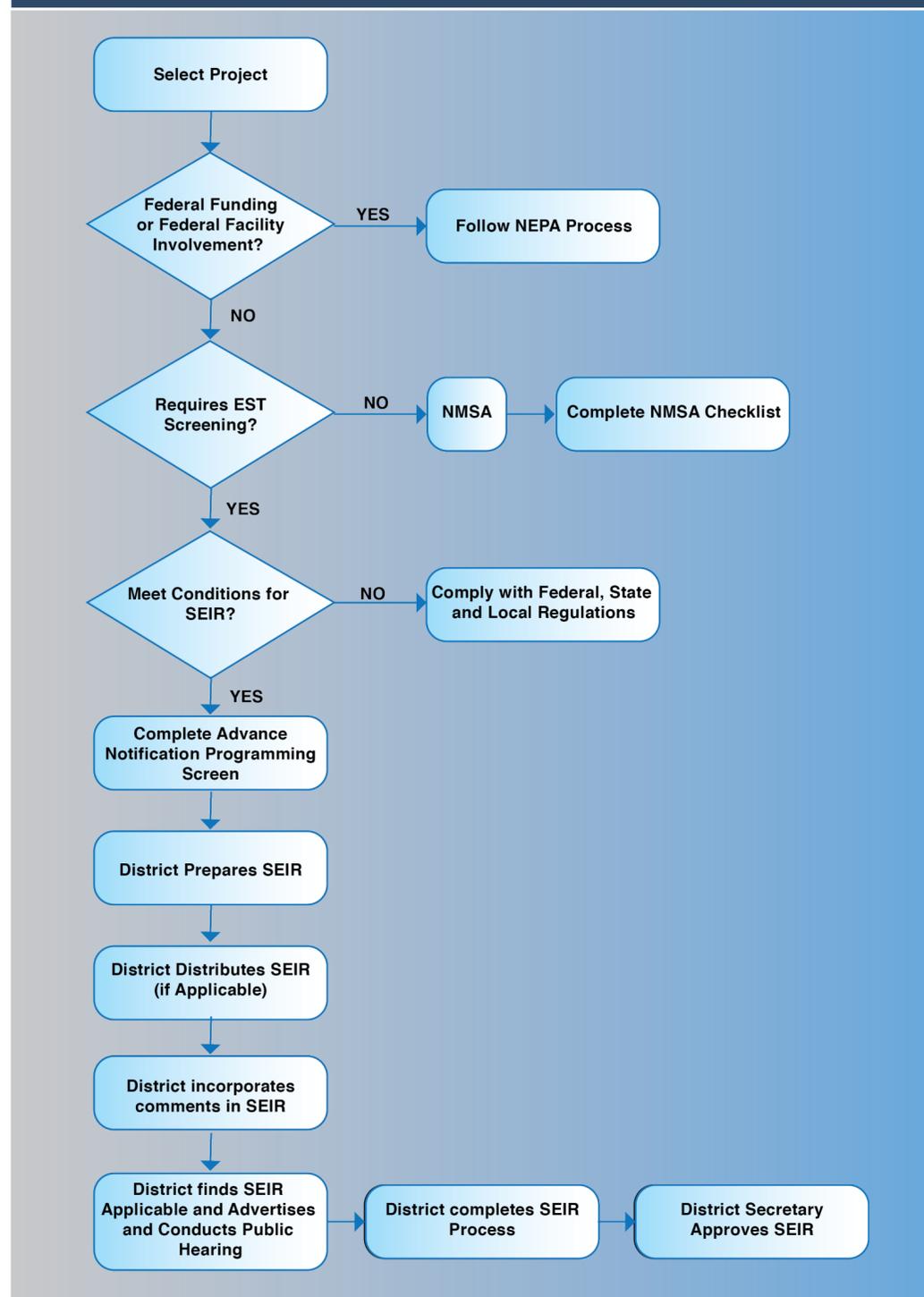
The previously mentioned environmental resources and evaluation processes apply to all airports in the FAA's NPIAS. It is important to note that non-NPIAS airports in Florida are subject to a separate environmental evaluation process with differing requirements. The level of assessment and documentation depends on the nature of the project, the potential for impacts, and FDOT's level of involvement.

A Non-Major State Action (NMSA) checklist or State Environmental Impact Report (SEIR) is required for all non-federal transportation projects where FDOT is responsible for providing funding. This is exclusive to state-funded projects, not FAA/federally funded projects. It should be noted, however, that this process is not sufficient for a project that is state-funded but that has a federal action (such as ALP approval) included. In this instance, the NEPA process would be required. There are three options for documenting the environmental evaluation of non-federal projects:

- 1. State Environmental Impact Report (SEIR)** – required for non-federal transportation projects that require screening through the FDOT Environmental Screening Tool (EST). For these projects FDOT is the lead agency. However, in some cases, FDOT is a cooperating agency rather than the lead agency.
- 2. Non-Major State Action (NMSA)** – required for FDOT projects which do not require EST screening and which do not have significant environmental effects. NMSAs are only required when FDOT is the lead agency.
- 3. Projects without FDOT involvement** – used when FDOT is not the lead agency; however, compliance with federal, state and local regulations is still required. The same procedures used when developing a SEIR can be followed. This document should not be called a SEIR.

A graphical depiction of the non-federal environmental process is shown in **Figure 8**. Additional information regarding environmental requirements pertaining to non-federal projects in Florida can be found on the [FDOT Environmental Management Office website](#).

**FIGURE 8. NON-FEDERAL ENVIRONMENTAL PROCESS**



## Federal and State Statutory Requirements

In addition to FAA Orders 1050.1F and 5050.4B and the PD&E Manual – Non-Federal projects chapter, Florida Statutes should also be consulted. FDOT projects are subject to environmental regulations that Federal, state, county, and local agencies oversee. Several of the environmental policies administered by these agencies share similar requirements, and consulting with regional planners can streamline agency coordination efforts.

## Additional Considerations

### Project Identification

As noted previously, for an Airport Master Plan, it is important to identify existing environmental issues that impact an airport as well as those that may arise due to the implementation of future development alternatives. It is imperative that all development alternatives are fully evaluated based on any known or potential environmental impacts on or near an airport. This evaluation helps identify recommended alternatives that may be included in the Master Plan. It also facilitates the decision-making process the FAA must complete as part of its project approval process. When a project enters the NEPA review process additional alternatives must be considered. Per FAA AC 150/5070-6B, Airport Master Plans:

1. The facility requirements and alternatives analysis chapters of the Master Plan should provide sufficient documentation regarding the justification for each project so that these chapters may serve as the basis for the purpose and need section of any environmental document.
2. Planners and environmental specialists should identify the potential key environmental impacts of each development project as part of the Master Plan alternatives analysis.
3. For some airports, only a few of the environmental impact categories will need to be discussed in the alternatives analysis (such as noise, wetlands, and social impacts), based on location-specific environmental issues identified in the environmental overview. Planners do not need to list each specific impact category mentioned in FAA Order 5050.4B, but only those resources the alternatives would likely affect.

To the extent feasible, during the Master Plan scoping process, planners should try to identify all potential short-term capital development projects that may be recommended in the Master Plan that would trigger additional environmental processing, such as safety-related projects. However, environmental analysis should not begin until the projects have been evaluated for their purpose, need, alternatives analysis, and sufficient justification. If an airport identifies capital development projects with sufficient justification before the Master Plan is complete, proceeding with environmental documentation and referencing said documentation in the Master Plan is recommended.

## Permits

Permits that may be needed for each proposed project—whether for NPIAS or non-NPIAS airports—should be identified in the Facilities Implementation Plan section unless an issue in the alternatives has been identified and the number or type of permits is different under the different alternatives.

Although such requirements can vary greatly within each locality, several of the permits that are typically necessary include:

- Clean Water Act, Section 404 Dredge and Fill Permit
  - This is a Federal action and will require the NEPA process by the U.S. Army Corps of Engineers
- Air Quality Permit for onsite batch plants or other construction-related activities
- Local government construction permits
- Growth Management Permits
- United States Fish and Wildlife Service, National Marine Fisheries Service opinions, or state Wildlife and Game Commission Permits, if protected and endangered species could be impacted
  - This is a Federal action and will require the NEPA process by the U.S. Fish and Wildlife Service the National Marine Fisheries Service (office of the National Oceanic and Atmospheric Administration)
- Clean Water Act, National Pollution Discharge Elimination System Permits
  - This is a Federal action and will require the NEPA process
- Florida Department of Environmental Protection (DEP)
  - The DEP issues numerous permits for environmental reasons including water management (through Water Management Districts), air resource, joint coasts, wetlands, waste, and others. Water Management Districts and DEP
  - DEP and Districts issue permits related wetlands, rivers, streams, lakes, ponds, estuaries, coastal systems, springs, groundwater, and surface water supplies.

## Emerging Trends in Environmental Considerations

### Sustainability

Some element of sustainability planning should be incorporated into a Master Plan if no existing sustainability management plan exists for an airport. The FAA provides guidance and lessons learned on sustainability planning as determined through their Sustainability Pilot Program at: [www.faa.gov/airports/environmental/sustainability/](http://www.faa.gov/airports/environmental/sustainability/). The FAA allows for sustainability to be incorporated into a Master Plan as either a stand-alone chapter or incorporated into each chapter, as appropriate; though, incorporating sustainability throughout a Master Plan may yield more benefits. As stated by the FAA in the document *Report on the Sustainable Master Plan Pilot Program and Lessons Learned*, the FAA states:

*“Despite the challenges, integrating sustainability into a master plan affords more opportunities to align sustainability and planning. Airports that chose to prepare a Sustainable Master Plan were pleased with their decision to do so. With one document to work from, it was easier for airport management and consultants to marry needed development with sustainability initiatives. Based on the master plans we’ve reviewed, those that intersperse sustainability throughout the document are more effective than ones that devote a chapter to the topic.”*

Additional resources for sustainability planning at airports include the Sustainable Aviation Guidance Alliance at [www.airportsustainability.org](http://www.airportsustainability.org) as well as numerous ACRP publications that can be accessed at [www.trb.org/ACRP/airport\\_sustainability.aspx](http://www.trb.org/ACRP/airport_sustainability.aspx).

### Recycling

The FAA Modernization and Reform Act of 2012 (FMRA) included provisions for AIP airports for recycling, reuse, and waste reduction to be more of a focus during the master planning process. The FMRA specifically provides two sections related to recycling, reuse, and waste reduction:

1. Section 132 (b) of the FMRA expanded the definition of airport planning to include “developing a plan for recycling and minimizing the generation of airport solid waste, consistent with applicable state and local recycling laws, including the cost of a waste audit.”
2. Section 133 of the FMRA added a provision requiring airports that have or plan to prepare a Master Plan, and that receive AIP funding for an eligible project, to ensure that the new or updated Master Plan addresses issues relating to solid waste recycling at the airport. This includes:

- The feasibility of solid waste recycling at the airport
- Minimizing the generation of solid waste at the airport
- Operation and maintenance requirements
- Review of waste management contracts
- The potential for cost savings or the generation of revenue

The FAA provides guidance on the development of this component of a Master Plan in its document “*Recycling, Reuse, and Waste Reduction at Airports: A Synthesis Document*.”

[www.faa.gov/airports/resources/publications/reports/environmental/media/recyclingsynthesis2013.pdf](http://www.faa.gov/airports/resources/publications/reports/environmental/media/recyclingsynthesis2013.pdf).

TRB’s *ACRP Synthesis 92 Airport Waste Management and Recycling Practices* provides a review of current practices, strategies and methods as well as universal objectives for airport waste management and diversion.

### Wildlife Management

While bird strikes by aircraft have garnered national attention in the recent years, airports are impacted by other types of wildlife such as alligators, boar, foxes, deer, and turtles. Not only can damage be caused to aircraft, operations can be delayed to clear wildlife. These concerns have led to several guidance documents on wildlife management at airports.

FAA AC 150/5200-33B *Hazardous Wildlife Attractants On or Near Airports* provides guidance on managing land uses that attract wildlife and considerations for the placement of new airport development projects. The FAA released the draft update of AC 150/5200-33C for comment in January 2019 but it has not yet been published. The draft AC expanded on the guidance and minimum standards of Wildlife Hazard Site Visit, Assessments, and Management Plans and provided checklists.

Section Two of the *FDOT Airport Compatible Land Use Guidebook* outlines the Florida laws, regulations, and processes applicable to compatible land use, including the handling of wildlife attractants.

## Environmental Documentation in a Master Plan

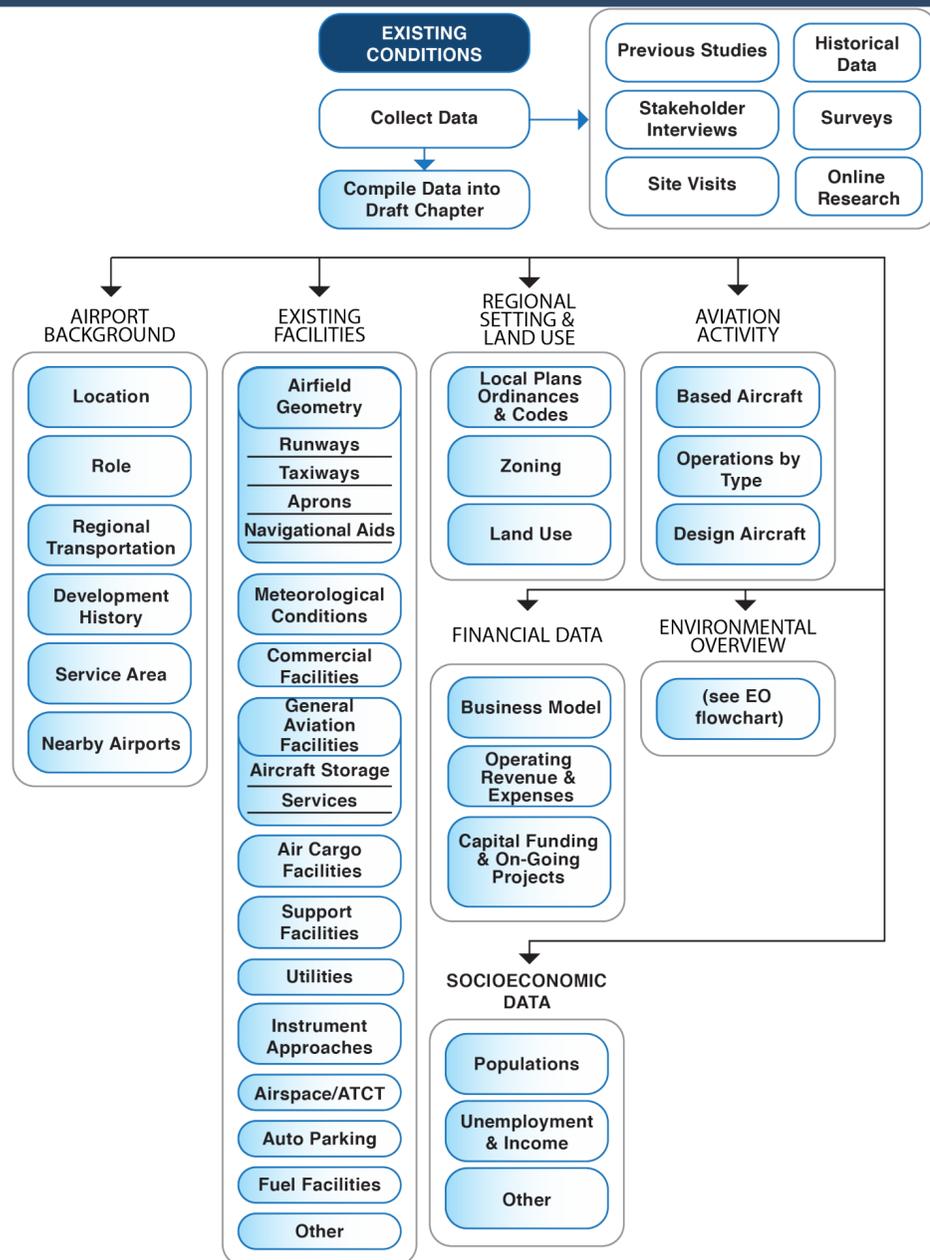
Environmental issues should be documented throughout applicable sections of an Airport Master Plan, including the existing conditions or alternatives analysis chapters, instead of a stand-alone section. The existing conditions chapter should document the airport’s current environmental setting, while the alternatives analysis chapter should document the potential environmental impacts associated with each development project alternative. Additionally, the recommended development plan for the airport should be evaluated to determine what the appropriate environmental coordination, approvals, and permits are required for the projects that are anticipated to be completed in the short term, defined as three to five years, so these are in place prior to design and construction. If environmental impacts are anticipated, the documentation process may need to be begun sooner to ensure adequate analysis can be completed to obtain the necessary approvals.

It is recommended that a chart or matrix be developed to identify the environmental issues and their locations for the evaluation of the development alternatives. This exercise will help to identify location specific environmental considerations, such as sea-level rise. Additionally, this provides a simplified examination of applicable Federal, state, and local environmental issues that currently, or could possibly, exist as a result of the proposed action.



One of the initial elements required for an Airport Master Plan is a thorough inventory of existing airport conditions to establish the baseline for the study's analysis and recommendations. Identifying airside, landside, and surrounding airport facilities and their conditions is critical to evaluating facility requirements and opportunities based on existing and forecasted demand. **Figure 9** displays an overall flow of collecting and compiling the data of pertinent topics from various sources into a usable format for use in the planning process. Although specific inventory elements included in an Airport Master Plan will vary based on airport size and activity level as well as project scope and budget, the FAA provides general guidelines for identifying and documenting existing conditions in *FAA AC 150/5070-6B, Airport Master Plans*.

**FIGURE 9. EXISTING CONDITIONS OVERVIEW**



- An inventory of existing conditions typically comprises the following elements:
- Airport Background
- Inventory and Description of Existing Facilities
- Regional Setting and Land Use
- Environmental Overview
- Socioeconomic Data
- Historical Aviation Activity
- Airport Financial Data

Collecting and compiling data is key to thoroughly documenting and understanding each element listed above. The majority of data recommended to document an Existing Conditions Chapter can be found online (online sources provided throughout this document), identified in previous planning documents, surveys and interviews with stakeholders, or obtained from an onsite examination. An inventory template form is provided in **Appendix 5**.

The typical elements of the Existing Conditions component of a Master Plan, as listed above, are discussed in the following sections.

### Airport Background

Generally, the Airport Background section provides a brief overview and history of the airport, its location, as well as its role in the national and state aviation systems and surrounding community. In addition to an overview, a graphical depiction of the airport's location in conjunction with its community and major transportation infrastructure is recommended. Other graphical enhancements, such as timelines that identify the history of the airport's development, are also beneficial.

For the airport's role, information on NPIAS airports can be found on the FAA's website: [www.faa.gov/airports/planning\\_capacity/npias/](http://www.faa.gov/airports/planning_capacity/npias/) and on the FDOT's Florida Aviation System Plan (FASP) website: [www.fdot.gov/aviation/FASP2035.shtm](http://www.fdot.gov/aviation/FASP2035.shtm).

It is also important that NPIAS General Aviation airports identify their classification according to the FAA's latest General Aviation Airports: A National Asset (referred to as ASSET 1) report. These new classifications are depicted in the latest NPIAS. The FAA has indicated it intends to update the ASSET analysis that determines classifications approximately every two years. The ASSET classifications appear in the 2019-2023 NPIAS report as "Role." The number and type of Florida airports included in the NPIAS are provided below.

Asset	Description	Number of Florida Airports
<b>National</b>	Supports the national and state system by providing communities with access to national and international markets in multiple states and throughout the United States	9
<b>Regional</b>	Supports regional economies by connecting communities to statewide and interstate markets	30
<b>Local</b>	Supplements communities by providing access to primarily intrastate and some interstate markets	29
<b>Basic</b>	Links the community with the national airport system and supports general aviation activities (e.g., emergency services, charter or critical passenger service, cargo operations, flight training and personal flying)	11
<b>Unclassified</b>	Provides access to the aviation system	1

Source: 2019-2023 NPIAS Report, Appendix A

For commercial service airports, the hub classification can also be an important indicator to include in this section as it speaks to the airport's role in the national aviation system.

Hub Type	Criteria (% of national passenger boardings)	Number of Florida Airports
<b>Large</b>	1% or more	4
<b>Medium</b>	At least 0.25%, but less than 1%	3
<b>Small</b>	At least 0.05%, but less than 0.25%	7
<b>Nonhub</b>	More than 10,000, but less than 0.05%	6

In Florida, there is an alternative funding source for transportation facilities considered "strategic." These facilities are designated in the state's Strategic Intermodal System (SIS). There are currently 22 SIS airports in Florida. As part of the master planning process, airports identify if they are included in the SIS.

### Inventory and Description of Existing Facilities

The Existing Conditions Chapter is primarily dedicated to identifying existing facilities within the airport's boundaries. Identifying all facilities on airport property will help guide the remaining section of the Master Plan and develop the ALP. According to *FAA AC 150/5070-6B, Airport Master Plans*, classifications commonly used to organize inventory sections include:

#### Airfield and Airspace

This section should identify the functional use and geometry of runways (see **Table 7**), taxiways, holding aprons, lighting, marking, signage, navigational aids, visual approach aids, and instrument approaches. The airfield data should be sufficient to understand how the existing facilities are accommodating activity from the length and width of the runway to its surface and strength, and any supporting facilities that determine which types of aircraft can utilize the airport.

#### Weather conditions

Weather conditions (e.g. wind direction, wind speed, cloud ceiling, visibility) are important for determining the adequacy of a runway's wind coverage in the Facility Requirements. Information regarding wind coverage and analysis can be found here: [https://airports-gis.faa.gov/public/windrose\\_help.html](https://airports-gis.faa.gov/public/windrose_help.html). It is important to note that wind data is not always available for all airports and sometimes data for nearby airports is used to document relevant general weather conditions.

#### Commercial Passenger Terminal Facilities

Building space is documented by functional use and size (area and linear). Ticketing/check-in areas, gates, passenger terminal curb front, restaurants and concessions, hold rooms, circulation, passenger screening, and baggage screening/handling areas are individually considered.

#### General Aviation Facilities

The quantity and type of aircraft storage hangars, transient aircraft parking apron, tie-down positions, GA terminal facilities, aircraft parking aprons, fixed-base operators (FBOs), maintenance, repair, and overhaul (MRO) facilities, flight schools, pilot shops, and number and mix of stored based aircraft fleet should be identified. Information regarding building locations, sizes, and functions should be collected, as well as any information on the dimensions and capacity of the apron areas.

## Air Cargo Facilities

Facility operators as well as the quantity and area of air cargo buildings and aircraft parking aprons should be documented.

## Support Facilities

The quantity and type of support facilities including Aircraft Rescue and Fire Fighting (ARFF), airport administrative areas, airport maintenance facilities, airline maintenance hangars, flight kitchens, aircraft fuel storage, heating and cooling systems, as well as FAA facilities and Air Traffic Control Tower (ATCT) (including hours of operation) should be identified.

## Access, Circulation, and Auto Parking

The quantity and type of ground access systems, including access roads, circulation and service roads, parking and curb space, should be inventoried. Information on public transportation and rental car facilities and activity shall be quantified, as well as shuttles that routinely use the airport to service off-site rental cars or parking, hotels, or other services.

## Utilities

Description of major infrastructure elements, such as water, sanitary sewer, communications, heating and cooling, and power are necessary. Stormwater drainage, deicing, and industrial waste disposal systems should also be included, as appropriate.

## Other

Non-aeronautical uses such as recreational facilities, parks, industrial parks, agricultural or grazing leases, and retail businesses should be identified in the inventory effort.

Other than where specific resources are identified, the majority of information required for the elements listed in **Table 7** can be obtained from previous airport-related studies, onsite inventories, or through conversations with the airport sponsor and tenants. It should be noted that an inventory of Existing Conditions does not require all of the elements described above, as many of these items may be unavailable or do not apply to all airports such as leasing surplus property for farmland. The data collection process and information to be obtained and analyzed should correspond with the elements and specifics identified in the overall project scope and may be discussed with the FAA or FDOT when the sponsor is unsure if it should be included.



### TABLE 7. RUNWAY GEOMETRY

Runway/Taxiway/Taxilane Data Table				
Runway 15/33				
ITEM	Existing		Future	
Runway Identification	Runway End 15	Runway End 33	Runway End 15	Runway End 33
Runway Design Code (RDC)*	A/I(S)/VIS	Same	A/I(S)/VIS	Same
Approach Reference Code (APRC)	A/I(S)/VIS	Same	A/I(S)/VIS	Same
Departure Reference Code (DPRC)	A/I(S)/VIS	Same	A/I(S)/VIS	Same
Pavement Surface Type	Asphalt/Turf	Asphalt	Asphalt/Turf	Asphalt
Pavement Strength (lbs.)	10,000 (single wheel)	Same	10,000 (single wheel)	Same
Pavement Strength (PCN)	n/a	n/a	10/F/B/W/U	n/a
Surface Treatment	None			
Effective Runway Gradient	0.54%	0.00%	0.54%	0.00%
Wind Coverage All Weather (10.5 knots)	95.48%	n/a	95.48%	n/a
Runway Length	2,400	2,349	2,400	2,349
Runway Width	50	60	50	60
Critical Aircraft	Cessna Skyhawk 172			
Approach Speed	62 knots			
Wing Span	36.08 feet			
Aircraft Tail Height	8.92 feet			
Main Gear (Outer)	TBD			
Cockpit to Main Gear/Wheelbase	5.42 feet			
Maximum Takeoff Weight (lbs.)	2,550 lbs.			
Runway End Latitude (NAD83)	25° 51' 06.18" N	25° 51' 6.12" N	25° 50' 45.67" N	25° 50' 45.96" N
Runway End Longitude (NAD83)	81° 23' 31.68" W	81° 23' 31.56" W	81° 23' 18.40" W	81° 23' 18.60" W
Runway End Elevation (MSL) (NAD88)	4.03 feet	5.00 feet	3.9 feet	5.00 feet
Displaced Threshold from Runway End	n/a	240 feet	n/a	240 feet
Displaced Threshold Coordinate Latitude (NAD 83)	n/a	25° 51' 03.99" N	n/a	25° 50' 47.98" N
Displaced Threshold Longitude (NAD83)	n/a	81° 23' 30.36" W	n/a	81° 23' 19.96" W
Displaced Threshold Elevation (MSL)	n/a	5.0 feet	n/a	5.0 feet
Runway Safety Area (RSA) Width	120 feet	Same	120 feet	Same
RSA Length Prior to Threshold	14 feet	240 feet	2 feet	240 feet
RSA Length Beyond Departure End	2 feet	240 feet	14 feet	240 feet
Runway Lighting Type	MIRL	Same	MIRL	Same
Approach Runway Protection Zone (RPZ) Inner Width x Outer Width x Length	250' x 450' x 1,000'			
Departure Runway Protection Zone (RPZ) Inner Width x Outer Width x Length	250' x 450' x 1,000'			

### TABLE 7. RUNWAY GEOMETRY (continued)

Runway Marking Type	Basic/Visual	Same	Basic/Visual	Same
14 CFR FAR Part 77 Approach Category	20:1	Same	20:1	Same
14 CFR FAR Part 77 Approach Type	Visual	Same	Visual	Same
14 CFR FAR Part 77 Approach Dimensions Inner Width x Outer Width x Length	250' x 1,250' x 5,000'			
14 CFR FAR Part 77 Approach Visibility Minimums	Visual	Same	Visual	Same
Visibility Minimums (RVR)	Visual	Same	Visual	Same
Type of Aeronautical Survey Required for Approach	Visual	Same	Visual	Same
Runway Object Free Area (ROFA) Length Beyond Runway	2 feet	240 feet	14 feet	240 feet
ROFA Length Prior to Threshold	14 feet	240 feet	2 feet	240 feet
ROFA Width	250 feet	Same	250 feet	Same
Runway Obstacle Free Zone (ROFZ) Length	2,800 feet	Same	2,800 feet	Same
ROFZ Width	250 feet	Same	250 feet	Same
Threshold Siting Surface (TSS) Approach Type	2	Same	2	Same
TSS Surface Slope	20:1	Same	20:1	Same
TSS Surface Dimensions Distance from Runway End x Inner Width x Outer Width x Inner Approach Length x Outer Approach Length	0' x 250' x 700' x 2,250' x 2,750'			
Runway Departure Surface Slope	n/a	n/a	n/a	n/a
Runway Departure Surface Dimensions Distance from Runway End x Inner Width x Outer Width x Length	n/a	n/a	n/a	n/a
Visual NAVAIDS	Wind Indicator, Segmented Circle	Same and 4-Box PAPI	Wind Indicator, Segmented Circle	Same and 4-Box PAPI
Instrument NAVAIDS	None	None	None	None
Instrument Approach Procedure Type	None	None	None	None
Instrument Approach Procedure Instrumentation	n/a	n/a	n/a	n/a
Touchdown Zone Elevation (MSL)	5.00 feet	5.00 feet	5.00 feet	5.00 feet
Taxiway Design Group	1B	Same	1B	Same
Taxiway/Taxilane Width	25 feet	Same	25 feet	Same
Taxiway Safety Area (TSA)	49 feet	Same	49 feet	Same
Taxiway Object Free Area (TOFA) Width	89 feet	Same	89 Feet	Same
Taxilane Object Free Area Width	79 feet	Same	79 feet	Same
Taxiway Centerline to Fixed or Movable Object	44.5 feet	Same	44.5 feet	Same
Taxilane Centerline to Fixed or Moveable Object	39.5 feet	Same	39.5 feet	Same
Taxiway Lighting	None	Same	None	Same

Source: Everglades Airpark Interim ALP Update, AVCON, INC.

## Regional Setting and Land Use

An Airport Master Plan should identify an airport's regional setting and impact, as well as its surrounding land use controls (see Table 8). In addition to a graphical depiction of the airport boundary, a Master Plan should describe or depict any local land use provisions and zoning ordinances. Applicable documents include but are not limited to:

- Local government comprehensive plans
- Land use plans
- Local or regional transportation plans
- Local zoning ordinances
- Land use controls
- Building codes
- Height ordinances
- Airport noise zones
- Airport overlay districts
- Statutes
- Sector Plans

**TABLE 8. LAND USE INFORMATION**

Land Use	Districts within Land Use
Residential	Rural (RR-1) Single Family (R-1) Single Family (R-1A)
Agricultural	Agricultural (AG) Agricultural (AG-2)
Industrial	Restricted Industrial (M-1) General Industrial (M-2)
Commercial	Neighborhood Commercial (NC) Highway Commercial Dev. (HCD)

Source: Peter Prince Airport Master Plan Update, 2012  
Hatch Mott MacDonald and Ricondo and Associates.

Properly examining and documenting these elements provides information on any existing non-conforming land uses at or near an airport as well as guidelines that assist in analyzing future airport improvements and potential development alternatives. It is important to review the existing land uses compared to the anticipated future land uses, which is typically shown through zoning ordinances and city general plans. Reviewing the zoning codes will allow the airport to obtain a better understanding of the anticipated future land uses surrounding the airport. Most of the aforementioned planning and land use documentation can be obtained from local units of government.

In addition to identifying surrounding airport land uses, it is also important to determine any land uses in the area that will be exposed to airport operations. This includes existing land uses, as well as the presence of obstructions to air navigation such as trees, terrain, buildings, towers, etc. This will help identify any areas near an airport that may be potentially hazardous to aircraft. Other areas and land uses such as flood control areas, stockyards, and landfills are also beneficial to note as they may represent a potential hazard. FAA Grant Assurance 20, Hazard Removal, states that an airport sponsor must take appropriate action to ensure that terminal airspace will be adequately cleared and protected by mitigating existing airport hazards and by

preventing the establishment of future hazards. FAA Grant Assurance 21, Compatible Land Use, obligates the airport sponsor to take appropriate actions to control existing and planned land uses in the vicinity of the airport to make them compatible with aircraft operations at the airport.

The FDOT Airport Compatible Land Use Guidebook, also discussed in the State, Federal, and Regulatory Requirements and Guidelines section of this Guidebook, provides additional information useful to airports and local governments during the master planning process. Section One of the Guidebook provides information on the principles of compatible land use, including 14 CFR Part 77. Section Two outlines the Florida laws, regulations, and processes applicable to compatible land use, including the requirement for local zoning and the handling of wildlife attractants and education facilities. Section Three outlines how to handle requests for future development. Section Four provides strategies to prevent and correct land use incompatibilities. Florida has several publications regarding Airport and Airspace Protection that can be found here: [www.fdot.gov/aviation/flpub.shtm](http://www.fdot.gov/aviation/flpub.shtm).

As a result of a 2016 amendment of Chapter 333, Florida Statutes, (see the following paragraph) the current Airport Compatible Land Use Guidebook contains significant portions of text and graphics that are inconsistent with the provisions of the current Chapter 333 and should not be relied upon to amend existing Airport Zoning Regulations. FDOT is in the process of revising the Guidebook to conform to Chapter 333 but it is not yet published.

Chapter 333, F.S. provides specific rules regarding airport zoning based on 14 CFR Part 77 as described in Airspace and Obstructions section of this Guidebook. Under Chapter 333, local governments and political subdivisions are required to adopt, administer, and enforce airport zoning regulations for airport hazard areas. An amendment to Chapter 333 in 2016 required a submittal to FDOT for airport zoning permit applications and amended airport zoning regulations. For more information on this Statute, refer to the State, Federal, and Regulatory Requirements and Guidelines chapter (page 71) and Appendix 3.

FAA released draft AC 150/5200-33C Hazardous Wildlife Attractants On or Near Airports for comment in January 2019 but it has not yet been published. The draft AC expanded on the guidance and minimum standards of Wildlife Hazard Site Visit, Assessments, and Management Plans and provided checklists.

FAA guidance on zoning and compatible land use is provided in a number of documents including AC 150/5190-4A A Model Zoning Ordinance to Limit Height of Objects Around Airports—and Interim Guidance on Land Use Within a Runway Protection Zone. These documents provide guidance on encouraging compatible land uses around airports, facilitating coordination between entities, and educating airport planners about local land use planning.

## Environmental Overview

The Environmental Overview section is an important component to include throughout an Airport Master Plan when applicable. According to FAA AC 150/5070-6B, Airport Master

Plans, an additional chapter and/or discussion of environmental considerations should be integrated into a Master Plan; this information may be contained within the Inventory chapter or as a separate chapter within the Master Plan. This is discussed in detail in the Environmental Considerations chapter of this Guidebook.

## Socioeconomic Data

Socioeconomic data is important to include in an Airport Master Plan because it provides detailed information regarding the market an airport serves. As stated by AC 150/5070-6B, socioeconomic data serves to:

- Ascertain the nature of the community and market the airport serves and/or impacts
- Provide specific inputs for the preparation of aviation demand forecasts, particularly econometric demand models

Chapter 163.3177(6)(a)2.g, F.S. requires the future land use element to include surveys, studies and data that address the compatibility of uses on lands adjacent to an airport as defined in Ch. 330.35, F.S. and consistent with Ch. 333.02, F.S.

Additionally, Ch. 163.3177(6)(a)3.b, F.S. requires that the future land use element include criteria to be used to achieve compatibility of lands adjacent to an airport as defined in Section 330.35 and consistent with Ch. 333.02, F.S.

A thorough understanding of an airport's local community can also assist short- and long-term planning efforts. However, it is the responsibility of the sponsor to identify which data elements will impact an airport. For example, in a community that experiences significant tourism, data pertaining to hotel rooms and occupancy rates may offer insight into passenger enplanements at the local airport. Similarly, a GA airport that experiences significant aerial applicator activity may benefit from data pertaining to the types of crops and aerial spraying activities in the region to help inform local trends in aviation.

Planners should utilize several data sources to properly identify local socioeconomic factors and how they may impact aviation activity. Local government units, the U.S. Census Bureau (<http://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml>), and independent database management companies such as Woods & Poole Economics ([www.woodsandpoole.com/](http://www.woodsandpoole.com/)) are all viable resources to obtain socioeconomic information. Additional sources also include the Bureau of Economic and Business Research (BEBR) ([www.bebr.ufl.edu/](http://www.bebr.ufl.edu/)), Global Insight ([www.library.hbs.edu/go/globalinsight.html](http://www.library.hbs.edu/go/globalinsight.html)) and the Enterprise Florida Data Center ([www.enterpriseflorida.com/data-center/florida-communities/floridas-counties/](http://www.enterpriseflorida.com/data-center/florida-communities/floridas-counties/)).

## Historical Aviation Activity

Documentation of current and historical aviation activity levels provides context for airport facilities and identifies local, regional, and national aviation trends. The availability of existing and historical aviation-related data is typically determined by an individual airport's size and activity level. For GA Airport Master Plans, current and historical data should be documented for based aircraft (number and fleet type), aircraft operations (number by operator and aircraft type), fuel sales (volume and fuel type if available), as well as aircraft storage facilities for based and transient aircraft. When collecting this information, consideration should be given to how this data will be used in the Aviation Forecasts section of a Master Plan. Collecting aviation activity data appropriately during the existing conditions inventory can eliminate redundant effort later in the project, such as peaking characteristics for a specific time of year and time of day that operations are occurring. **Table 9** provides an example of a historical based aircraft inventory.

### Florida Specific Information!



Chapter 163.3177(6)(a)2.g, F.S. requires the future land use element to include surveys, studies and data that address the compatibility of uses on lands adjacent to an airport as defined in Ch. 330.35, F.S. and consistent with Ch. 333.02, F.S. Additionally, Ch. 163.3177(6)(a)3.b, F.S. requires that the future land use element include criteria to be used to achieve compatibility of lands adjacent to an airport as defined in Section 330.35 and consistent with Ch. 333

**TABLE 9. HISTORICAL BASED AIRCRAFT**

Based Aircraft (1990–2000)					
Year	Single-Engine (1)	Multi-Engine (1)(2)	Jet (2)	Helicopter (1&2)	Total
1996	22	0	0	0	22
1997	24	0	0	0	24
1998	24	0	0	0	24
1999	36	0	0	0	36
2000	36	0	0	0	36
2001	30	0	0	0	30
2002	30	0	0	0	30
2003	30	0	0	0	30
2004	30	0	0	0	30
2005	30	0	0	0	30
2006	30	0	0	0	30
2007	30	0	0	0	30
2008	41	1	0	0	42
2009	31	1	0	0	32
2010	21	1	0	0	22
2011	23	1	0	0	24
2012	22	2	0	0	24
2013	21	2	0	0	23
2014	22	2	0	0	24
2015	21	2	0	0	23
2016	20	2	0	0	22
2017	18	2	0	0	20

Source: Apalachicola Regional Airport Master Plan Update, AVCON, INC.

For Airport Master Plans at commercial airports, current and historical data should be identified for airlines that serve the airport, passenger enplanements (domestic and

international), operations (commercial and GA), based aircraft (number and fleet mix), and air cargo activity (if applicable).

Resources for aviation-related data are described in greater detail in the Aviation Forecast section of this Guidebook. At commercial airports, airlines typically make passenger data available to airport management. At towered airports, operational data is generally made available directly from ATCT personnel. For all facilities (including non-towered), aviation data resources include:

- **FAA Terminal Area Forecasts** – Forecasts prepared to meet the budget and planning needs of the FAA and provide information for use by state and local authorities, the aviation industry, and the public (<http://aspm.faa.gov/main/taf.asp>)
- **Florida Aviation System Plan** – Incorporates the traditional aviation system planning elements provided for in most State aviation system plans ([www.cfaspp.com.com/FASP/Fasp.aspx](http://www.cfaspp.com.com/FASP/Fasp.aspx))
- **5010 Airport Master Record** – Airport IQ is an online database that provides extensive information about any airport in the United States ([www.gcr1.com/5010web/](http://www.gcr1.com/5010web/))
- **Florida Aviation Database** – Central repository for Florida aviation system data ([www.florida-aviation-database.com/](http://www.florida-aviation-database.com/)); password required
- **Bureau of Transportation Statistics** – An online database that provides domestic and international data on passengers, cargo, and fares, as well as numerous other data fields ([www.transtats.bts.gov/databases.asp?Mode\\_ID=1&Mode\\_Desc=Aviation&Subject\\_ID2=0](http://www.transtats.bts.gov/databases.asp?Mode_ID=1&Mode_Desc=Aviation&Subject_ID2=0))
- **Airport Management and Previous Studies**
- **Passenger/Tenant Surveys** – guidance on conducting passenger surveys can be found in ACRP Report 26 Guidebook for Conducting Airport User Surveys
- **Manual Operations Counts** – guidance on conducting manual counts can be found in ACRP Synthesis 4 Counting Aircraft Operations at Non-Towered Airports

**Airport Financial Data**

Understanding an airport’s financial status is important for evaluating development alternatives related to financial feasibility of specific projects later in the Airport Master Plan process. The three primary components of an inventory of Financial Data that should be included in an Airport Master Plan are as follows:

- **Summary of Airport Business Model**
  - Financial operations of the airport (how the airport incurs costs and revenues and applicable funding mechanisms)
  - Funding of capital projects (Passenger Facility Charges, leases, bonds, etc.)
  - Funding of an individual airport if part of a multi-airport system
- Operating Revenues and Expenses
- Includes general categories of operating revenues and expenses
- Capital Funding
- Airport’s ongoing capital improvement program and how it funds its capital development program

In addition to the three components listed above, it is important to document recently administered and ongoing airport grants. This includes any FAA AIP grants, FDOT grants,

and local bonds or other local funding sources. More details on this topic are provided in the Financial Feasibility Analysis chapter of this Guidebook.

Additional information for FAA AIP eligibility and grant assurances can be found here: [www.faa.gov/airports/aip/](http://www.faa.gov/airports/aip/).

Florida provides an overview of airport funding and its grant program on the FDOT website, which can be accessed here: <http://www.fdot.gov/aviation/fundinginfo.shtm>. This link also provides access to the Florida Aviation Project Handbook, which provides detailed information on numerous funding opportunities available to Florida’s airports.

**Compliance and Other Considerations**

**Compliance**

An airport must adhere to both federal and state regulations to remain compliant. The FAA provides airport design and engineering standards in its AC library that contain design standards for a multitude of categories including runway lighting, drainage, and airfield facilities. As part of the Existing Conditions, non-standard features should be cataloged and included in the Master Plan document. FAA design standards can be found here: [www.faa.gov/airports/engineering/design\\_standards/](http://www.faa.gov/airports/engineering/design_standards/).

At the state level, FAC Rule 14-60 and Chapter 330 and 333 of the Florida Statutes provide the foundation for compliance for airports within Florida. Standards for airports, airport markings, and airport lighting, as well as airspace protection with respect to the licensing of Florida airports are provided in FAC Rule 14-60; airport zoning requirements, procedures for the adoption of zoning regulations, and the review and enforcement of the zoning regulation are provided in Chapter 333. For more information on both statutes, refer to the State, Federal, and Regulatory Requirements and Guidelines chapter of this Guidebook.

**Documentation Guidelines**

Proper documentation of the existing conditions is key for entire planning process, because it is the baseline used to determine the future facility requirements and opportunities based on the forecasted activity of the airport. FAA AC 150/5070-6B, Airport Master Plans, provides guidelines for documenting existing airport conditions within the overall Master Plan document. It states that the documentation of existing airport conditions should make liberal use of drawings, tables, aerial photographs, and exhibits produced from GIS databases. Developing the existing conditions in this way makes the information easy to understand, interpret, and locate for later reference.

It is important to include only information pertinent to the planning study so as to not overwhelm or confuse readers. Not all information that is collected as part of the Existing Conditions research effort needs to be included within the report. It is likely that some data or information will only be used to support later technical analyses.

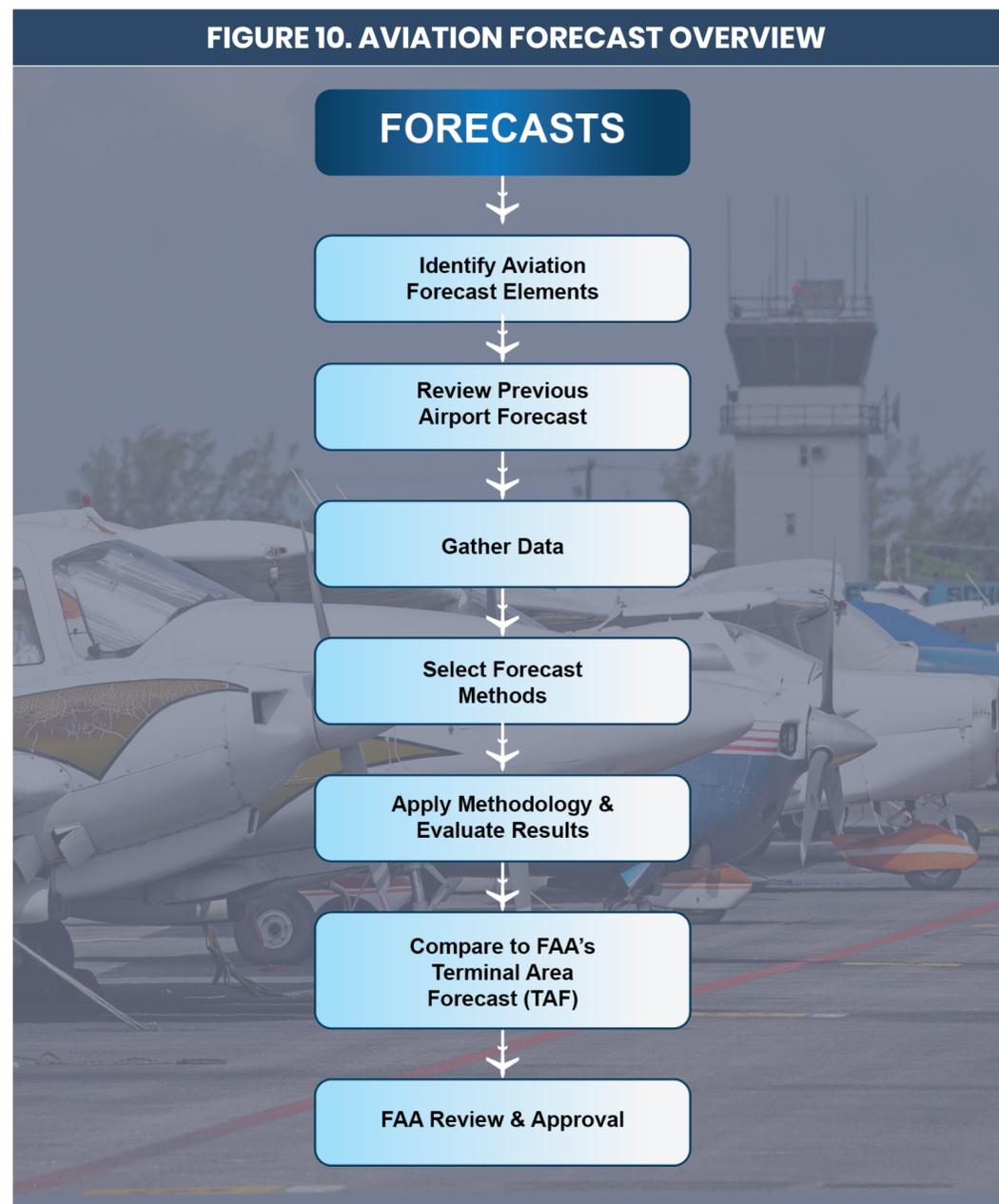
**Florida Specific Information!**



At the state level, FAC Rule 14-60 provides the foundation for compliance for airports within Florida. Standards for airports, airport markings, and airport lighting, as well as airspace protection with respect to the licensing of Florida airports are provided in FAC Rule 14-60. Correcting the deficiencies identified in a 14-60 inspection is a critical element of any master planning effort. Sponsors are responsible for annual renewal of airport license, coordinating an inspection, and correcting deficiencies prior to expiration of license.”

Understanding the projected or forecasted demand for aviation and aviation-related services is a critical element of the overall Master Plan process. Forecasts are used to justify and validate an airport’s ability to accommodate future activity, as well as determine the type, size, and timing of future landside and airside development.

As shown in **Figure 10**, this section discusses the overall process of developing realistic aviation activity forecasts that can later be used to determine the future needs and opportunities of an airport.



Planners should begin by identifying aviation forecast elements and then obtaining historical data for those elements. It is important to understand that there can often be significant short- or long-term fluctuations in aviation activity at individual airports, in a specific region, or system-wide. Consequently, it is important that aviation forecasts developed for Master Plans or other aviation-related studies incorporate data beyond historical activity and identify existing and potential future trends that may affect an airport.

The sources and methodologies outlined in this section provide airport sponsors and consultants with a framework in which to develop aviation forecasts that, in turn, guide the analysis of future airport development requirements and alternatives.

This chapter addresses the following elements pertaining to the development of aviation-related forecasts:

1. Forecast Purpose
2. Steps in the Forecast Process and Approvals
3. Forecast Elements and Data Resources
4. Forecast Methodologies
5. Specific Forecasts and Examples

It should be noted that if forecasts are submitted to the FAA for approval, there are certain forecast elements required for Master Plans while other elements are merely recommended. These elements are identified in subsequent sections of this chapter.

**Forecast Purpose**

The purpose of a Master Plan forecast is to provide a realistic estimate of activity that can be used to evaluate facility needs. Historical aviation activity such as aircraft operations, based aircraft, and passenger enplanements may help predict future activity levels. However, at many airports, future aviation activity may be influenced by factors such as existing airport facilities, the location of the airport relative to other airports, the price and convenience of air services offered, or costs associated with fueling/aircraft storage. Off-airport factors that may influence demand include regional or local socioeconomic characteristics of the surrounding communities, business activity, or the desirability of nearby communities as a tourism or business hub.

**Steps in the Forecast Process and Approvals**

The Federal guidelines for the aviation forecasting process identified in FAA AC 150/5070-6B, Airport Master Plans are useful to all airports regardless of their participation in the Federal aviation system. Another publication that provides excellent guidance on the forecasting process is *ACRP Synthesis2 Airport Aviation Activity Forecasting*.

Even though this Guidebook is specific to the State of Florida, the FAA forecasting process includes many components that apply to all Airport Master Plans regardless of location. The level of effort and elements required for an Airport Master Plan will largely be contingent on an airport’s role and activity level; however, forecast steps in the master planning process are provided on the following pages.

**Review Previous Airport Forecasts**

Forecasts from prior studies including prior master plans and the latest published FAA TAF should be reviewed. Additional forecasts to review may include state and/or regional plans such as the FASP or other documents such as relevant EAs, EISs, or noise studies. Although forecasts developed for other studies may be outdated or no longer relevant, understanding their context can be valuable, especially from a historical perspective that can lend insight into what has driven change in the past.

**Identify Aviation Forecast Indicators**

Aviation activity indicators required for a forecast include the level and type of activities that are likely to affect facility needs. For airfield planning, the most important activities are aircraft operations and aircraft fleet mix, since these define airfield facility requirements. As a general rule, plans for GA airports require forecasts of aircraft operations by aircraft type, number and type (fleet mix) of based aircraft, and existing and projected critical aircraft type and number of operations. Airports with commercial service require forecasts of aircraft operations, based and operational aircraft fleet mix, and passenger enplanements. Passenger levels are particularly important in determining the size of the terminal building and other important airport infrastructure needs such as parking facilities and access roads. In addition, at larger commercial service airports, the type of system in place plays a big role in terminal sizing in terms of whether it is an origin and destination (O&D) airport or an airline hub operation. A list of forecast indicators required by the FAA and those that should be included where appropriate is shown in **Table 10**.

TABLE 10. AVIATION DEMAND INDICATORS	
Required	Included While Appropriate
<b>Aircraft Operations (Annual)</b>	
<u>Itinerant</u> Air Carrier Air Taxi and Commuter (Regional) General Aviation Military <u>Local</u> General Aviation Military	Domestic vs. International Annual Instrument Approaches Instrument Flight Rule (IFR) vs. Visual Flight Rule (VFR Operations) Air Cargo Aircraft Operations Touch and Go Operations (Training) Helicopter Operations Average Load Factor (Commercial Airports) Fuel Use
<b>Passengers (Annual)</b>	
<u>Enplanements</u> Air Carrier Commuter <u>Enplanements</u> Originating Connecting	Passenger Data Domestic vs. International General Aviation Passengers Helicopter Air Taxi
<b>Aircraft</b>	
<u>Based Aircraft</u> <u>Aircraft Fleet Mix</u> Critical Aircraft	Average Seats/Aircraft
<b>Air Cargo (Annual)</b>	
<u>Air Cargo</u>	Air Cargo/Freight Data

Source: FAA AC 150/5070-6B, Airport Master Plans

## Collect Data

The next step is to determine the data needed to prepare the forecasts, identify potential and obtainable data sources, and compile the information for both historical and forecast periods. The data to be gathered and the relevant time periods depend on the forecast parameters.

## Select Forecast Methods

While there are several appropriate methodologies and techniques for forecasting aviation activity at an airport, selecting and applying the appropriate ones requires astute professional judgment. The availability of data and patterns/fluctuations of airport-specific activity will largely influence which methodologies should be employed, however, several factors can impact activity, including those that are not necessarily dictated by an airport or its facilities. The available data should be evaluated and methodologies should be selected that best reflect those factors that impact an airport. This chapter identifies several commonly used forecast methodologies for Airport Master Plans. Additional methodologies may be used if deemed reasonable and justifiable.

## Apply Forecast Methods and Evaluate Results

After compiling a list of forecast elements, assembling the necessary data, and selecting the appropriate forecast methodologies, the next step is to prepare the actual forecasts. If multiple forecast methodologies are used, they will likely yield differing results. Therefore, evaluating the reasonableness of the results and their consistency with other forecasts may be necessary.

## Compare Forecast Results with the FAA's Terminal Area Forecasts

Forecasts that are subject to FAA approval should compare results with those contained in the most recent TAF. To facilitate this comparison, the FAA recommends completing the template in Appendix C of FAA Office of Aviation Policy and Plans (APO) *Forecasting Aviation Activity by Airport* (July 2001) ([www.faa.gov/data\\_research/aviation\\_data\\_statistics/](http://www.faa.gov/data_research/aviation_data_statistics/)). Consistency with the TAF is discussed in more detail below.

## Coordinate with Agencies to Approve Forecasts

Typically, any aviation demand forecasts developed for Airport Master Plans or Master Plan Updates that receive FAA AIP funding must be submitted to the FAA for approval. The FAA develops its own aviation demand forecasts for active NPIAS airports in its TAF.

In Florida, the FAA Orlando ADO is responsible for approving forecasts. When reviewing a sponsor's forecast, the ADO must ensure that it is based on reasonable planning assumptions, uses current data, and was developed utilizing appropriate forecast methods.

For all classes of airports, forecast indicators including enplanements, based aircraft, and operations are evaluated for consistency with the TAF. If a forecast is not consistent with the TAF, differences must be resolved if the forecast is to be used in FAA decision-making. This may involve revising the airport sponsor's submitted forecasts, adjusting the TAF, or both. Master Plan forecasts for enplanements, based aircraft, and operations are considered consistent with the TAF if they meet the following criteria by FAA airport classification:

- **Large, Medium, and Small Hub Airports**
  - Forecasts differ by less than 10% in the five-year forecast and 15% in the 10-year period, or
  - Forecasts do not affect the timing or scale of an airport project

- **Other Commercial Service Airports**
  - Forecasts differ by less than 10% in the five-year forecast and 15% in the 10-year period, or
  - Forecasts do not affect the timing or scale of an airport project, or
  - Forecasts do not affect the role of the airport
- **General Aviation and Reliever Airports** (when the five- or 10-year forecasts exceed 100,000 total annual operations or 100 based aircraft<sup>1</sup>)
  - Forecasts differ by less than 10% in the five-year forecast and 15% in the 10-year period, or
  - Forecasts do not affect the timing or scale of an airport project, or
  - Forecasts do not affect the role of the airport

If the Master Plan forecasts are expected to be inconsistent with the TAF for any reason, the FAA Project Manager should be contacted early in the forecast development process to discuss the implications of the variance.

Locally prepared forecasts may contain a more detailed analysis of socioeconomic conditions or development that is not considered when preparing the TAF. Therefore, airport sponsors should review the FAA's TAF for their airport on a regular basis and notify their FAA Planner/Planning Program Manager when it is believed that local conditions merit a revision to the TAF. When requesting a change to the TAF, the airport sponsor should provide reliable historical data and letters from individuals with the authority to affect airport activity, which document planned changes in operations or based aircraft.

It should be noted that FDOT reviews and approves forecasts for Airport Master Plans developed for airports not included in the NPIAS. Even when FDOT approval of forecasts is not required forecasts should be submitted to FDOT for review as these projections may be incorporated into the FASP or Florida Aviation Database (FAD). Final review and/or approval of any master plans, specifically forecasts, should be coordinated with FDOT district offices, although documents are ultimately reviewed by the FDOT Aviation Office.

## Forecast Elements and Data Resources

The classification of an airport impacts the effort required to develop forecasts of aviation-related demand. Similarly, the availability of data varies significantly based on an airport's facilities. Many commercial service airports in the U.S. are towered facilities, while most GA airports are not. According to the FAD, as of July 2017, there were 763 public and private airports, heliports, and seaplane bases in Florida, 64 of which were equipped with an ATCT. This distinction is important because a towered facility is more likely to have accurate historical data in terms of annual, monthly, and sometimes even actual time and date of aircraft operations. As noted in Table 10, the FAA identifies both required and suggested forecast elements for Airport Master Plans. Although activity (and forecast

### Florida Specific Information!



FDOT reviews and approves forecasts for Airport Master Plans developed for all Florida airports. FDOT may incorporate these projections into the FASP or FAD. Final review and/or approval of any master plans, specifically forecasts, should be coordinated with FDOT district offices, although documents are ultimately reviewed by FDOT's Aviation Office.

<sup>1</sup>When the five- or 10-year forecast is for less than 100,000 total annual operations or 100 based aircraft, the forecast does not need to be reviewed at FAA Headquarters, but the data should be provided to the FAA for the annual update of the TAF.

effort) can vary significantly among airports, typical Master Plan elements for a GA and commercial service airports are provided on the following pages.

For GA airports, typical forecast elements in a Master Plan include:

- Based Aircraft
  - Based Aircraft Fleet Mix
- Aircraft Operations
  - Local/Itinerant Operations
  - Military Operations
  - Operational Fleet Mix
  - Critical Aircraft (type, existing and projected annual operations)
- Other items where appropriate include:
  - Auto Parking
  - Touch and Go Operations (to determine airfield capacity and delay)
  - Daytime/Nighttime Operations
  - Instrument Operations/Visual Operations
  - Aircraft Fuel Sales

## Based Aircraft

Based aircraft are GA aircraft considered airworthy and based at an airport for a majority of the year. According to the FAA, an aircraft is airworthy when it conforms to its Type Certificate and the aircraft is in a condition for safe operation. (Note: commercial aircraft are not included as based aircraft). If it is unknown where an aircraft is based, the airport sponsor should meet with the aircraft owner to determine if an aircraft is based at their airport. The *FAA National Based Aircraft Inventory Program* now allows airport sponsors to digitally input based aircraft at their airport into a database. If there are multiple airports that claim an aircraft with the same tail number, this aircraft is flagged and the sponsor is immediately notified and can contact that aircraft owner to confirm its home airport. It is recommended that sponsors upload the most current information on based aircraft to [www.basedaircraft.com](http://www.basedaircraft.com).

For commercial airports, typical forecast elements in a Master Plan include:

- Based Aircraft
  - Based Aircraft Fleet Mix
- Aircraft Operations
  - Local/Itinerant Operations
  - Commercial Operations
    - Commercial Fleet Mix
  - Military Operations

- Overall Operational Fleet Mix
- Critical Aircraft (type, existing and projected annual operations)
- Passenger Enplanements
  - Air Carrier/Commuter/Air Taxi
  - Originating/Connecting
  - Domestic/International
  - Average Load Factor

Other items where appropriate include:

- Auto Parking
- Touch and Go Operations
- Daytime/Nighttime Operations
- Instrument Operations/Visual Operations
- Aircraft Fuel Sales
- Air Cargo Operations and Tonnage
- Average Seats per Aircraft

The following section identifies required elements and resources to obtain pertinent data.

### Based Aircraft

- **Form 5010-1 Airport Master Record**
  - Periodically updated by individual airport sponsors and contains current year (or most recent year) information on:
    - Based aircraft
    - Aircraft operations
    - Airport facilities
  - Link: [www.gcr1.com/5010web/default.cfm](http://www.gcr1.com/5010web/default.cfm)

### FAA Terminal Area Forecast<sup>2</sup>

- The TAF reports historical counts from the Form 5010-1 (dating to 1990), and projected (through year 2050) for:
  - Based aircraft
  - Aircraft operations by type
  - Passenger enplanements for all commercial service airports
  - Link: <https://aspm.faa.gov/main/taf.asp>

### FAA Operations and Performance Data

- Aviation System Performance Metrics (ASPM)
- Airport analysis
- City pair analysis
- Taxi time
- Operational Network (OPSNET)

<sup>2</sup> It should be noted that for smaller airports and non-towered airports, the TAF may be only infrequently updated to reflect existing activity at an airport. Using TAF data for historical and current estimates of based aircraft may be useful, but is typically not as accurate as actual counts conducted by an airport sponsor. The TAF is not available for all NPIAS airports and is not available for non-NPIAS airports.

- Operations and delay
- Traffic Flow Management System Counts (TFMSC)
  - Airport and distributed OPSNET
- Airline Service Quality Performance (ASQP)
  - Operations by airport
- Business Jet Reports
  - Monthly business jet report
- Link: <https://aspm.faa.gov/>

### 5010 Reminder!

*5010 records are usually updated at the time of the airport's inspection or when major changes are made to the airport's facilities. It is the airport sponsor's responsibility to provide regular updates to the FAA.*

**Updates are submitted electronically to the FAA**

### Florida Aviation System Plan<sup>3</sup>

- Provides data on based aircraft
- Provides an overview of the state's airport system and includes profiles of individual airports
- The latest FASP should be consulted for available forecasts
- Link: [www.fdot.gov/aviation/FASP2035.shtm](http://www.fdot.gov/aviation/FASP2035.shtm)

### FDOT Data and Forecasts<sup>4</sup>

- Reports commercial service operations, enplanements, GA operations, and GA based aircraft forecasts at Florida airports
- Link: [www.fdot.gov/aviation/dataforecasts.shtm](http://www.fdot.gov/aviation/dataforecasts.shtm)

### Florida Aviation Database (FAD)

- The FAD reports historical counts provided by airports (dating to 1988), and projected (through year 2035) for:
  - Based aircraft
  - General aviation operations
  - Commercial operations
  - Commercial enplanements
- Link: <http://www.fdot.gov/aviation/planning.shtm> Previous studies

### Previous studies

- Master plans that incorporated historical data or forecasts at an airport
- It is important to review the source of the data included in previous studies and determine if it is valid. Since Airport Master Plans are typically updated every 5-to-10 years, there may be a significant time gap between estimates reported in previous studies and an updated or new Master Plan. Changing conditions may decrease the usefulness of historical activity as a relevant indicator of potential future activity. Consequently,

<sup>3</sup>The FASP was updated in 2017.

<sup>4</sup>Note: More up-to-date forecast data on operations, enplanements, and based aircraft is available than the posted 2013 PDFs on this site.

the party responsible for developing forecasts for a new study may need to use previous study estimates in conjunction with other resources.

### Airport Inventory

- Actual data that may be recorded by an airport sponsor
  - This is often the most accurate resource for determining historical and existing based aircraft at an airport. In many cases, airport sponsors take annual or periodic inventories of existing based aircraft. Although these counts may be compared to the 5010-1 Airport Master Record or the FAA TAF, the sponsor counts may prove to be the most reliable data available. If possible, it should be noted in the Master Plan how the data was obtained and in what capacity inventories were conducted (annually, semiannually, etc.). Actual airport sponsor inventory data may vary significantly from other resources such as the FAA TAF or National Based Aircraft Inventory; however, if the estimates are believed to be accurate, they should be used as a basis for developing based aircraft forecasts.

A summary of resources for based aircraft is shown in **Figure 11**.

**FIGURE 11. BASED AIRCRAFT RESOURCES**



### Aircraft Operations

There are several factors that impact the number of aircraft operations occurring at a particular airport, including:

- Number of based aircraft
- Local demographics
- National economic and aviation-related trends
- Proximity to other airports
- On-airport businesses
- Capability and condition of facilities
- FBO activity
- Business needs

Airports with ATCTs usually have time- and date-specific aircraft operation data available for developing aircraft operations forecasts. This is the most reliable resource for historical operations data and is particularly useful in identifying aviation activity trends as well as peaking characteristics. If available, tower counts should be used as the primary source for aircraft operations data. It should be noted that most ATCTs are not staffed 24 hours per day, and therefore some number of operations may not be included in reported figures. Other sources for commercial operations data include databases provided by businesses such as Innovata by Cirium, Airline Data, Inc., and AOG (formerly the Official Airline Guide). These resources are described in later sections of this Chapter.

The FAA defines an aircraft operation as an airplane's landing, takeoff, or touch-and-go procedure on an airport's runway. Aircraft operations projections are used to determine airport design criteria.

At non-towered facilities, there are several additional resources that can be utilized to determine historical aircraft operations data including the previously mentioned 5010-1 Airport Master Record, FAA TAF, FAD, and FASP. Additional sources that can prove extremely beneficial for data pertaining to aircraft operations, particularly at non-towered facilities, are databases that report filed flight plans to and from airports. Two of the more well-known sources that provide filed flight plan data available for purchase are FlightAware and AirportIQ, and the data generally includes basic information such as:

- Departure and arrival points
- Estimated time en-route
- Alternate airports in case of bad weather
- Type of flight
  - Instrument flight rule (IFR)
  - Visual flight rule (VFR)
- Pilot information
- Aircraft tail number
- Aircraft type

Usually, a flight plan is filed for any operation that is conducted under IFR conditions. Reported flight plan data is generally skewed toward commercial and larger GA aircraft operations because all GA pilots are not IFR-certified and some GA aircraft are not equipped with adequate instrumentation for IFR conditions.

Flight plans are documents filed by a pilot or flight dispatcher with FAA prior to departure that indicate the plane's planned route or flight path.

Information from these databases is typically obtained through private companies that track and record all flight plans for a specific timeframe. Individual airport reports are available for a fee and can be customized to fit the scope and budget of a particular Master Plan or Master Plan Update. Two examples are:

- [FlightAware's custom report center](#)
- [AirportIQ's data center](#)

Another resource for identifying operations at non-towered airports is a manual count of aircraft operations. This option is contingent on the budget and schedule of an Airport Master Plan. Manual counts can be conducted using several types of equipment for various lengths of time. Ideally, an entire year's worth of data would be produced; however, more realistically, one-to-three months' worth of observations should provide adequate information regarding the number and type of aircraft operations.

Types of manual counting procedures for aircraft operations are identified in ACRP Report 129, Evaluating Methods for Counting Aircraft Operations at Non-Towered Airports, which is available here: [http://onlinepubs.trb.org/onlinepubs/acrp/acrp\\_rpt\\_129.pdf](http://onlinepubs.trb.org/onlinepubs/acrp/acrp_rpt_129.pdf).

Another methodology for estimating aircraft operations specific to non-towered facilities is using operations per based aircraft (OPBA). This methodology applies either a general planning ratio or an average OPBA identified for the state or region in which that the airport is located. For example, using data identified in the FAA TAF, the average OPBA for all non-towered facilities in Florida can be identified. This figure may then be applied to 5-, 10-, and 20-year planning horizon forecasts of based aircraft at an airport to generate estimates of aircraft operations. It should be noted that since FAA TAF data for non-towered facilities are estimates, the OPBA methodology also produces an estimate and is not as accurate as actual counts. An OPBA operational estimate may provide context for justification of the operations forecasts. An example of the OPBA methodology is shown later in this section in **Table 11**.

A summary of resources for aircraft operations data is shown below:

- Towered Airports
  - Tower Data
- Non-Towered Airports
  - AirportIQ, FlightAware, etc.
  - Manual Counts
  - 5010, TAF, FAD, FASP, OPBA, Previous Studies
  - Aircraft Fleet Mix

An airport's fleet mix comprises two elements:

- Based aircraft fleet mix
  - Identification of historical, existing, and projected number and type of aircraft that will be based at an airport
- Operational fleet mix
  - Disaggregate estimates of total activity by specific aircraft type or aircraft grouping

Judgment and the type of analysis determine the level of detail required. Both based aircraft fleet mix and operational fleet mix should be grouped by aircraft class: single-engine piston, multi-engine piston, turboprop, jet, helicopter, military, and other.

**Figure 12** provides an example of how this information may be displayed in a Master Plan.



Knowing the frequency of the specific make and model of aircraft within each of these aircraft classes is key in determining the applicable dimensional design standards for individual runway systems and for other airport elements and facilities. *FAA AC 150/5000-17 Critical Aircraft and Regular Use Determination* provides federal standards for determining existing and future Critical Aircraft determinations based upon current and forecast operations at an airport. The critical aircraft is the most demanding aircraft type or grouping of similar aircraft responsible for at least 500 annual operations at an airport, excluding touch-and-go operations.

If an airport has a detailed inventory of the type of based aircraft, it should be used as a starting point to forecast future based aircraft fleet mix. If this data is unavailable, conducting an inventory of the existing fleet or reference to the 5010-1 Airport Master Record will be necessary.

As with based aircraft, an airport's fleet mix can also be influenced by several important factors such as existing airfield and landside facilities. For example, if a GA airport specifically caters to small aircraft, has a runway length less than 4,000 feet, and its existing operational fleet is primarily comprised of single-engine piston aircraft, it is less likely that the airport's fleet mix will change significantly in the future without an identified reason. Conversely, if an airport is located in a community with significant business growth or has facilities designed to accommodate larger corporate GA aircraft, it may see a higher proportion of multi-engine piston aircraft or jets based and operating there in the future.

Additional sources of data for GA fleet mix can be produced from locally available data from airport operators, a simple survey of based aircraft owners or an FBO, or an examination of databases from private companies. It should be noted that data pulled from these databases will not necessarily determine the future based aircraft or operational fleet mix, but provides the necessary information to make reasonable assumptions regarding future activity.

## Passenger Enplanements

Typically, passenger enplanement forecasts are only critical to planning at commercial service airports. Passenger activity at a specific airport can be influenced by many factors such as population of the local market, proximity to other airports, cost of airfares, and route destinations and frequencies, to name a few.

Similar to other forecast elements, the most accurate source for passenger enplanement data is from the airport itself. U.S. domestic and international (U.S. and foreign flag carriers) enplanements are derived from the U.S. DOT's T-100 database. Regional carrier enplanements are derived from U.S. Department of Transportation (DOT) T-100 and 298-C data. Since airlines must report all revenue passenger enplanements to the FAA, the TAF is also a useful resource for developing forecasts. However, it should be noted that annual statistics reported in the FAA TAF are based on the Federal fiscal year (October 1 through September 30) rather than the calendar year. Additionally, the FAA TAF and its sources (FAA's National Flight Data Center, U.S. DOT T-100 and 298-C Databases, Airline Origin and Destination Survey, Air Carrier Activity Information System) do not report non-revenue passengers, and in some cases, airlines may report inaccurate passenger counts. As such, there can be discrepancies between annual data reported by an airport and data reported in the FAA TAF.



## Peak Period Forecasts

An important component of developing aviation demand forecasts is peak activity levels. Understanding peaking characteristics assists in facility and capacity planning. Peak period forecasts include peaking characteristics for monthly, daily, and hourly aviation-related activity. Although some airports may not experience significant fluctuations in the level of aircraft or passenger activity, many airports do and it is an important component of forecasting.

Peak activity can be attributed to numerous factors depending on an airport's primary role and function, several of which are identified below:

### At commercial service airports, peaking may be attributed to:

- Seasonal passenger travel patterns
- Specific annual or one-time events
- Part-time or seasonal airline service
- Airline schedule or equipment changes
- Other

### At GA airports, peaking may be attributed to:

- Same as at commercial airports
- Favorable weather conditions
- Seasonal agricultural activity
- Aerial operator activity
- Flight training activity
- Other

Developing peak period forecasts of passenger activity and aircraft operations is critical for facility planning because the information helps identify appropriate benchmarks for when existing facilities may need improvements or when new facilities may be required. It is important to note that facilities should not be planned to accommodate the absolute busiest timeframe that occurs at an airport, but rather typical periods of time that experience regular peaking activity. This safeguards from "over-planning" or underutilization of airport facilities when the airport is experiencing average or below-average levels of aviation activity.

Peak period forecasts for Airport Master Plans are usually developed for aircraft operations and passenger enplanements and include:

- Peak month enplanement and operations activity
- Average daily activity in the peak month (PMAD)
- Peak hourly activity on PMAD

Typically, towered commercial airports maintain monthly historical passenger and operations data obtained from airlines and the ATCT. This database reports annual, monthly, daily, and hourly scheduled departure and arrival data for large commercial airports. Daily or hourly throughput statistics are the most reliable data for developing baseline and projected daily and hourly peaking activity levels, if available. If not, several assumptions are used to generate estimates for PMAD and hourly activity. A simple calculation of dividing the number of passenger enplanements or operations for the peak month by the number of days in that month is generally acceptable to identify PMAD. To determine hourly peaking characteristics, further analysis such as examining airline schedules, passenger load factor (LF) or tower counts for the airport is required.

Most commercial service airports post airline schedules on their websites; however, there are several companies that provide airport-specific passenger enplanement data with information such as flight origin and destination, type of aircraft, and passenger load factor data for a fee. Examples include Innovata, Airline Data, Inc., and AOG (formerly the Official Airline Guide).

*ACRP Report 82: Preparing Peak Period and Operational Profiles*—Guidebook describes a process and includes software for converting annual airport activity forecasts into forecasts of daily or hourly peak period activity. The publication also provides two Excel-based software modules to help estimate current and future design day aircraft and passenger operation levels based on user-defined design day parameters.

For certain airports, primarily those containing higher levels of commercial schedule service, the development of a design day flight schedule (DDFS) may be required to assess facility needs associated with peaking. It may also be needed for noise and/or air quality analyses. Guidance on the preparation of DDFSs can be found in *ACRP Research Report 163, Guidebook for Preparing and Using Airport Design Day Flight Schedules*.

At non-towered facilities, basic assumptions can be made to interpret peaking characteristics. These can be aided by manual counts or the previously mentioned private databases. If these resources are not available or do not provide adequate data, it may be necessary to identify peaking characteristics through qualitative information provided by airport personnel.

## Automobile Traffic (Landside Transportation)

Although not required by the FAA for approval, another forecast element that should be analyzed is automobile (auto) traffic. Although auto traffic at airports is directly tied to aviation activity, it is not specifically considered as an aviation element and therefore is not included in **Table II**. Although this component is not always necessary for smaller airports, it can be extremely important for busier airports. Understanding traffic volumes that access an airport assists with landside planning components such as parking lots, terminal curbside, and access roads. It can also be important to compare existing traffic volumes and patterns with proposed airport improvement projects to determine the impacts to the transportation system surrounding the airport.

Typically, there are four resources to determine existing auto traffic volumes at or around an airport, including:

- Data from the airport's host county or municipality
- Manual traffic count data
- Electronic traffic count data
- Passenger/user survey data

Selecting the appropriate source for auto traffic depends on the data available and specific needs of each airport. While surveys are typically more useful at busier GA airports or commercial airports, utilizing a survey is often dictated by the scope and budget for a Master Plan. Regardless of the source, auto traffic should be calculated for annual, monthly, and peak daily and hourly counts, if possible.

Additional general planning estimates for auto trip generation and planning criteria can be found in **ACRP Report 25, Airport Passenger Terminal Planning and Design**.

## Air Cargo

Another forecast element that is often analyzed in an Airport Master Plan is air cargo activity. Air cargo activity is generated by a diverse collection of companies with differing business strategies and market roles including:

- **Integrated Carriers**
  - Freight door-to-door using own fleet
- **Freight Forwarders**
  - Brokers that link shippers with freight carriers; coordinate freight but do not transport
- **All-Cargo Carriers**
  - Sell space to freight forwarders or individual companies
- **Combination Carriers**
  - Carry passengers and freight on a single aircraft
- **Belly Freight Carriers**
  - Carry cargo in baggage compartment of passenger aircraft

An air cargo forecast for an airport may reference comprehensive forecasts for the air cargo industry such as Boeing's biennial World Air Cargo Forecast, the International Air Transport Association Cargo Strategy, or the FAA Aerospace Forecasts. The forecast will serve as a basis for evaluating the capacity of existing cargo processing facilities and for determining future requirements for buildings, aircraft parking aprons, and ground access facilities.

**ACRP Report 143, Guidebook for Air Cargo Facility Planning and Development** explores tools and techniques for sizing air cargo facilities, including data and updated metrics for forecasting future facility requirements as a function of changing market and economic conditions. Forecasts of air cargo activity typically identify tonnage of mail and cargo.

ACRP Synthesis 80, **Estimating Truck Trip Generation for Airport Air Cargo Activity** compiles existing information about air cargo truck trip generation studies and maybe useful for estimating trips associated with proposed cargo facilities.



## Airport Master Plan Forecast Elements and Resources – Summary

In general, when collecting data for developing aviation-related activity for Airport Master Plans, valid information obtained directly from an airport is often the most useful and accurate.

The list below identifies general resources for aviation-related activity. The following sections focus on typical methodologies used to develop forecasts as well as the steps for the entire forecasting process.

1. ATCT Counts (if available)
2. Airline Data (if available/applicable)
3. FAA TAF
4. Private Data Providers
5. Airport Manager Inventory
6. FASP
7. 5010-1 Master Record
8. ACRP Publications
9. General Aviation Manufacturers Association Publications
10. International Air Transport Association Publications
11. Aircraft Manufacturer Forecasts

## Forecast Methodologies

Airport Master Plan forecasts are typically developed to project aviation-related activity over a 20-year period. The effort put forth to develop the forecasts can vary significantly based on the size and type of airport, availability of reliable data, and project scope and budget. A Master Plan conducted for a small GA airport may only examine the most essential basic elements while a plan for a busy commercial airport may require an exhaustive effort that includes elements beyond what is identified in this Guidebook. This section describes each methodology based on information identified in the 2001 FAA Report, *Forecasting Aviation Activity by Airport*.

## Regression Analysis

In regression analysis, the value being estimated (or forecast)—the dependent variable—is related to other variables—the independent or explanatory variables—that “explain” the estimated value. An example of a regression equation is to estimate passenger enplanements as a function of economic variables (e.g., income and airfares). The relationship is estimated using historical data for the independent and dependent variables. The explanatory power of the equation is measured by the R<sup>2</sup> statistic (called the coefficient of determination). An R<sup>2</sup> of 0 indicates that there is no statistical relationship between changes in the independent and dependent variables. R<sup>2</sup> values near 1.0 mean that there is a very strong statistical relationship. Forecasts of the independent variables are used in the regression equation to calculate forecast values for the dependent variable. Regression analysis should be restricted to relatively simple models with independent variables for which reliable forecasts are available. Because regression analysis can be used to infer casual relationships between variables, this methodology is most useful for all types of aviation activity when it is unclear what the driving force is behind aviation activity.

## Linear Trend or Trend Line Analysis

The linear trend methodology examines historical activity growth trends and applies these trends to current demand levels to yield projections of future activity. Linear trend analysis assumes that activity, and the factors that have historically affected activity, will continue to influence demand levels at similar rates over an extended period of time. Linear trend projections are typically used to provide baseline forecasts that reflect stable market conditions. This approach is useful for forecasting any type of aviation activity where no unusual local conditions differentiate the study airport from other airports in the region.

## Share Analysis

Share analysis or “market share” forecasting is a relatively easy method to use and can be applied to any measure for which a reliable higher-level (e.g., larger aggregate) forecast is available. Historical shares are calculated and used as a basis for projecting future shares. A typical example where this may be appropriate is an airport's percentage share of national enplanements. An airport might historically have a relatively constant 0.22% share of U.S. domestic enplanements. Perhaps the share has shown little variation over the period being measured (e.g., ranged between 0.21% and 0.23% of the national total). Given no expected structural changes in air service, it may be acceptable to extrapolate the historic share which would indicate that the airport's enplanement activity would be expected to grow at a rate similar to the national enplanement rate. This methodology is useful for all types of aviation activity (enplanements, operations, based aircraft, etc.) when there are strong indications that an individual airport's activity mimics that of a larger grouping of airports.

## Exponential Smoothing

Exponential smoothing is a statistical technique that may be especially valuable in producing short-term forecasts. This technique produces a forecast based on a time series analysis of observations in which the most weight is given to the most recent observation and decreasing weights are given to earlier observations. This method would give more weight to the latest trends and conditions at the airport (e.g., new carrier hubbing at the airport). Exponential smoothing would be a recommended forecast methodology for any type of aviation-related activity that has experienced a significant change in a short period of time.

## Comparison with Other Airports

Comparing the airport to be forecast with other airports of relative size and relevant characteristics can be a valuable technique, specifically in projecting airport enplanement growth after a major change such as the addition of the first low-fare carrier. In this case, an analogy can be made to growth rates achieved at similar airports after initial low-fare carrier service was obtained. It may also be appropriate to compare airport forecasts to statewide forecasts that are available, such as those identified in the FASP or established forecasts for other airports in the same region.

## Survey Techniques

APO report “Forecasting Aviation Activity by Airport” notes that surveys and analyses based on surveys can play an important role in developing airport forecasts, especially when the spatial distribution of passenger trip ends must be estimated. Such information is needed to support ground transportation planning or airport access needs. It is also crucial when considering a new airport or airport relocation. These surveys are specifically aimed at establishing the travel patterns of air travelers — where the trip in the region originates or terminates, trip purpose, and the traveler's relevant socioeconomic

characteristics. Examples of survey techniques include questionnaires distributed to travelers, data collected from travel agents, and license plate surveys conducted at airport parking lots.

### Cohort Analysis

Cohort analysis is used to disaggregate a larger group in order to study the components (cohorts) separately. This could apply to passengers, cargo shipments, and GA users but is not normally used in airport planning projects except for special applications. For example, if one is forecasting passengers for a city like Orlando to disaggregate the historical flow of passengers into major groups (e.g., individuals going to theme park, those on business, those attending a convention, and local residents on personal travel) is very useful. If a time series or even a good “snapshot” of each of these cohorts can be established, a separate analysis can be made of the likely factors that underlie the passenger demand of the separate cohorts.

### Choice and Distribution Models

In some forecasting analyses, it is important to evaluate regional aviation demand (or even regional transportation demand) and distribute the demand between or among alternate aviation facilities. This can occur especially in the situation where an airport(s) in the region may be opening or closing during the forecast period. The important elements in this technique are an adequate database, and knowledge of the structure of traveler choices. The data requirements for estimating a choice model can be extensive.

### Specific Forecasts and Documentation Examples

Forecasts developed for Master Plans should be presented as a stand-alone chapter and culminate with a comparison to the FAA TAF (as applicable and required if subject to FAA approval). Typically, historical activity for the various forecast elements is presented as an introduction to the forecasts themselves. This is followed by the actual forecasts with an explanation of the various methodologies employed. If more than one methodology is presented, each segment of the document dedicated to a forecast element should culminate with a preferred methodology in conjunction with justification for its validity. The following provides an overview of typical forecast elements and examples from existing Florida Airport Master Plans to provide guidance on the type and layout of information that should be included.

### Based Aircraft Forecast

Forecasts of based aircraft should begin with an accurate determination of the number of existing and, if available, historical based aircraft at an airport. The forecast for based aircraft should broadly mimic one of the previously discussed methodologies or another method that can properly be explained and justified. Typically, the number of based aircraft at an airport can be related to an individual or collective grouping of variables (socioeconomic characteristics or by other factors at the airport such as existing facilities (FBOs, fueling facilities, flight training schools).

In *Forecasting Aviation Activity by Airport* the FAA notes that whatever method is used to forecast aviation demand, it is usually helpful to incorporate an analysis of local and regional socioeconomic data.

Once a preferred forecast for the total number of based aircraft has been determined, fleet mix forecasts should also be developed. This will assist in planning for airfield facilities such as aircraft storage and parking apron, fueling facilities, runways and taxiways, navigational aids, and others. Fleet mix projections should be presented by aircraft type.

When applicable, local, regional, and national trends in aviation should be examined in conjunction with the existing based aircraft fleet mix to determine future projections. Local and regional trends can often be ascertained by examining levels of aviation-related activity or socioeconomic trends. National trends may not always impact all airports; however, it can be useful to compare existing activity at an airport with national trends in aviation. There are many national publications that offer broad trends in aviation activity and aircraft production. One such publication is the FAA’s Aerospace Forecasts, which is a report that is updated annually and provides a 20-year economic and aviation activity outlook for the U.S. airport system. The [FAA Aerospace Forecast Fiscal Years 2019–2039](#) includes the most recent forecast data.

An additional element typically included in forecasts of based aircraft is an airport’s Critical Aircraft (also known as the Design Aircraft), which is defined by the FAA as the most demanding aircraft with at least 500 annual operations that operates or is expected to operate at an airport. Identification of an airport’s critical aircraft may be derived from operational data or an approved Airport Layout Plan. FAA AC 150/5000-17 Critical Aircraft and Regular Use Determination was published in June 2017. The AC recommends that the Critical Aircraft determination be submitted with the sponsor’s forecast so that the FAA approval can address the forecast and the critical aircraft determination.

An example of based aircraft forecasts prepared for the Leesburg International Airport (FPR) Airport Master Plan are shown in **Table II** including the legend of methodologies and abbreviations.

**TABLE II. SUMMARY OF BASED AIRCRAFT FORECASTING METHODS FOR LEESBURG INTERNATIONAL AIRPORT**

Aircraft Operations Forecast											
Year	Historical	2014 FAD	2014 IALPU	FL GA Airports	All FL Airports	Years 1996–2006	Years 1990–2015	Years 1990–2006	2016–2036 FAA Aerospace Forecasts	2017 FAA TAF	2017 Indexed TAF
1990	152										
1995	152										
2000	186										
2005	186										
2010	90										
2015	85										
2020		166	166	91	91	94	76	91	86	93	121
2025		182	178	97	98	104	67	96	87	103	134
2030		200	185	103	104	115	60	103	88	113	147
2035		n/a	n/a	111	112	127	53	109	88	123	160
AACG											
1990–2015	-2.3%										
2010–2015	-1.1%										
2015–2020		14.3%	14.3%	1.3%	1.4%	2.0%	-2.3%	1.3%	0.2%	1.8%	7.3%
2020–2025		1.9%	1.4%	1.3%	1.4%	2.0%	-2.3%	1.3%	0.2%	2.1%	2.1%
2025–2030		1.9%	0.8%	1.3%	1.4%	2.0%	-2.3%	1.3%	0.2%	1.9%	1.9%
2030–2035		n/a	n/a	1.5%	1.5%	2.0%	-2.3%	1.3%	0.2%	1.7%	1.7%

Notes: FAD = Florida Aviation Database, IALPU = Interim Airport Layout Plan Update, FL GA = Florida General Aviation, FL = Florida, TAF = Terminal Area Forecast, AACG = Average Annual Compound Growth  
Source: Leesburg International Airport Master Plan Update, AVCON, INC.

### Aircraft Operations Forecast

Once the most reliable data has been identified for aircraft operations, several of the previously mentioned forecast methodologies should be examined and a preferred methodology should be selected. Typically, an Airport Master Plan will examine at least two methodologies for each forecast element and identify a preferred projection based on calculated or estimated correlation to that element.

Once a preferred methodology has been identified and forecasts for 5-, 10-, and 20-year planning horizons have been developed, most Airport Master Plans require a breakdown of projected operations by aircraft type. This typically includes separate projections for local and itinerant operations, as well as GA and commercial operations and operational fleet mix. In some instances, the Master Plan may call for forecasts of daytime and nighttime operations as well. If none of the aforementioned resources provide daytime/nighttime information, anecdotal evidence provided by airport management may suffice. An example of an operations forecast comparison prepared for the Okeechobee County Airport Master Plan is shown in **Table 12**.

**TABLE 12. AIRCRAFT OPERATIONS FORECAST FOR OKEECHOBEE COUNTY AIRPORT**

Okeechobee County Peak Operations Forecast				
Year	Annual Operations	Peak Month Operations	Average Day Operations	Peak Hour Operations
2016	50,000	5,000	161	16
2021	58,235	5,823	188	19
2026	67,826	6,783	219	22
2031	78,996	7,900	255	25
2036	92,006	9,201	297	30

Source: Okeechobee County Airport Master Plan Update, AVCON, INC.

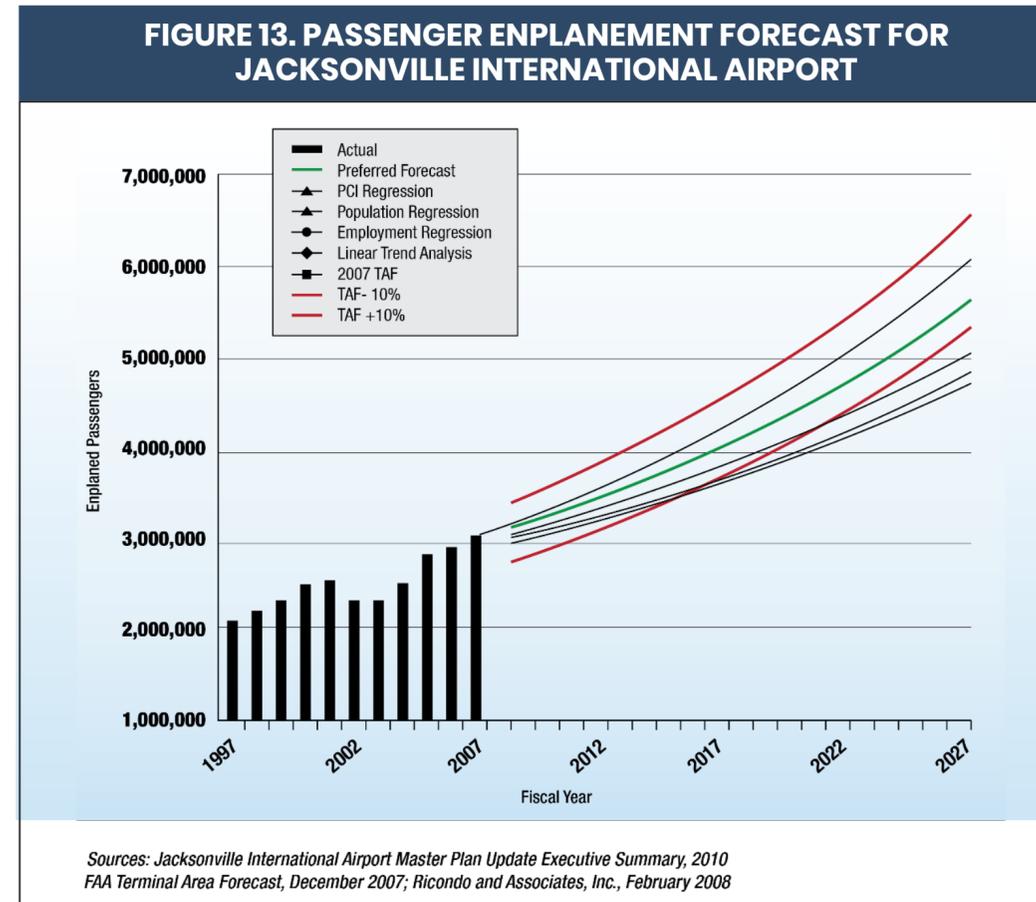
### Passenger Enplanement Forecast

At commercial service airports, passenger enplanement forecasts provide the basis for landside facilities such as the passenger terminal, auto parking, rental car facilities, and several others. Fortunately, passenger enplanement data are usually made available from airport personnel via the airlines themselves. Because this data is actual counts, no guesswork or assumptions are required to produce accurate historical records.

Passenger enplanement projections should be compared with the FAA TAF and previous forecasts such as the FASP to ensure reasonableness. There may be instances when information that has not been accounted for in other forecasts is made available, such as an airline's plans to expand existing service or add new routes. Conversely, forecasts should include factors such as loss of service or local factors that may inhibit passenger enplanements. When specific instances such as these occur, the proposed forecasts may vary significantly from those identified in the FAA TAF. Proper justification for forecasts submitted to the FAA is important, even if they do fall within the tolerance for FAA approval (10% in the -year forecast period, and 15% in the 10-year forecast period). From a planning perspective, it is more important to produce reasonable and accurate forecasts of passenger

activity than it is to be within the acceptable range of the FAA TAF. This is particularly important for passenger enplanement forecasts as they often provide justification for significant landside facilities that pertain to passenger terminal buildings, auto parking, etc. Additional information regarding forecasts and landside facility requirements is provided in ACRP Report 25, **Airport Passenger Terminal Planning and Design**.

An example of passenger enplanement forecasts prepared for an Airport Master Plan is shown in **Figure 13**.



### Peaking Characteristics Forecast

Peak forecasts of passenger activity and aircraft operations are essential for facility planning at both commercial and GA airports. As noted, it is important to base facility requirements on peak activity levels that occur on a regular basis. Peak activity levels should be determined by identifying actual figures of passenger activity and aircraft operations that occur regularly or by applying basic assumptions.

If detailed passenger activity and aircraft operations data are readily available, regularly occurring monthly, daily, and hourly peak characteristics can be identified. These figures can be applied to annual projections of activity and extrapolated for the 20-year planning horizon or analyzed separately if adequate data is available. For example, if scheduled commercial operations by aircraft type are obtained through OAG or a

similar database, it may be possible to identify near-term changes in enplanements and adjust long-term peak forecasts accordingly.

As noted previously, a typical Master Plan identifies peak month, peak month average day (PMAD), and peak hour levels of activity for the 20-year projection period. An example of peaking characteristic forecasts prepared for an Airport Master Plan is shown in **Table 13**.

**TABLE 13. PEAK OPERATIONS FOR DEFUNIACK SPRINGS AIRPORT**

Year	Aircraft Operations	Peak Month Operations	Average Day Peak Month Operations	Peak Hour Operations
2015	17,230	1,723	57	6
2020	19,024	1,902	63	6
2025	21,004	2,100	70	7
2030	23,190	2,319	77	8

Source: DeFuniack Springs Airport Master Plan Update, 2010  
 URS, 2010



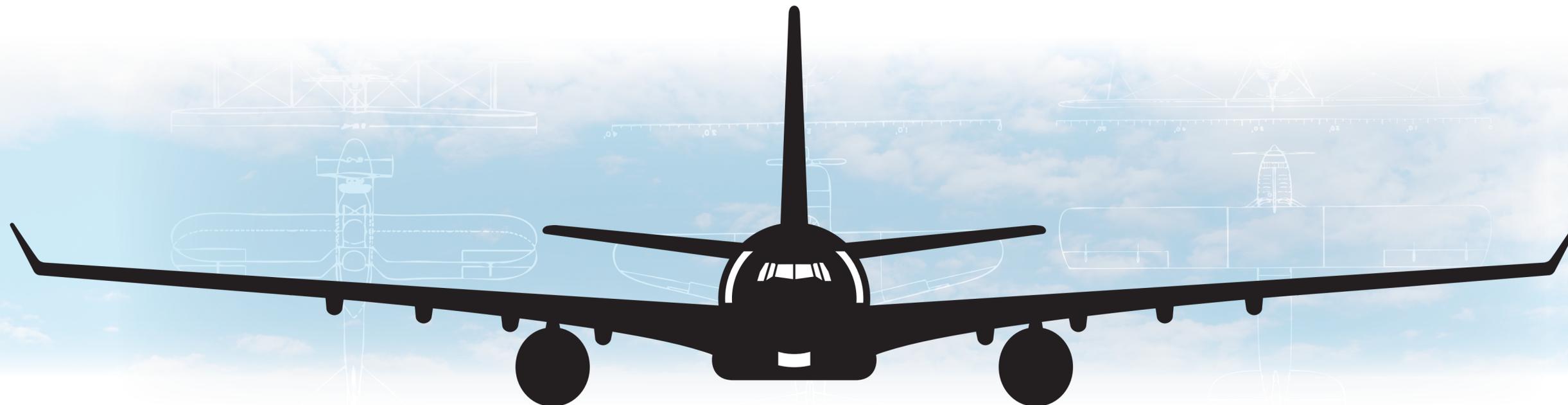
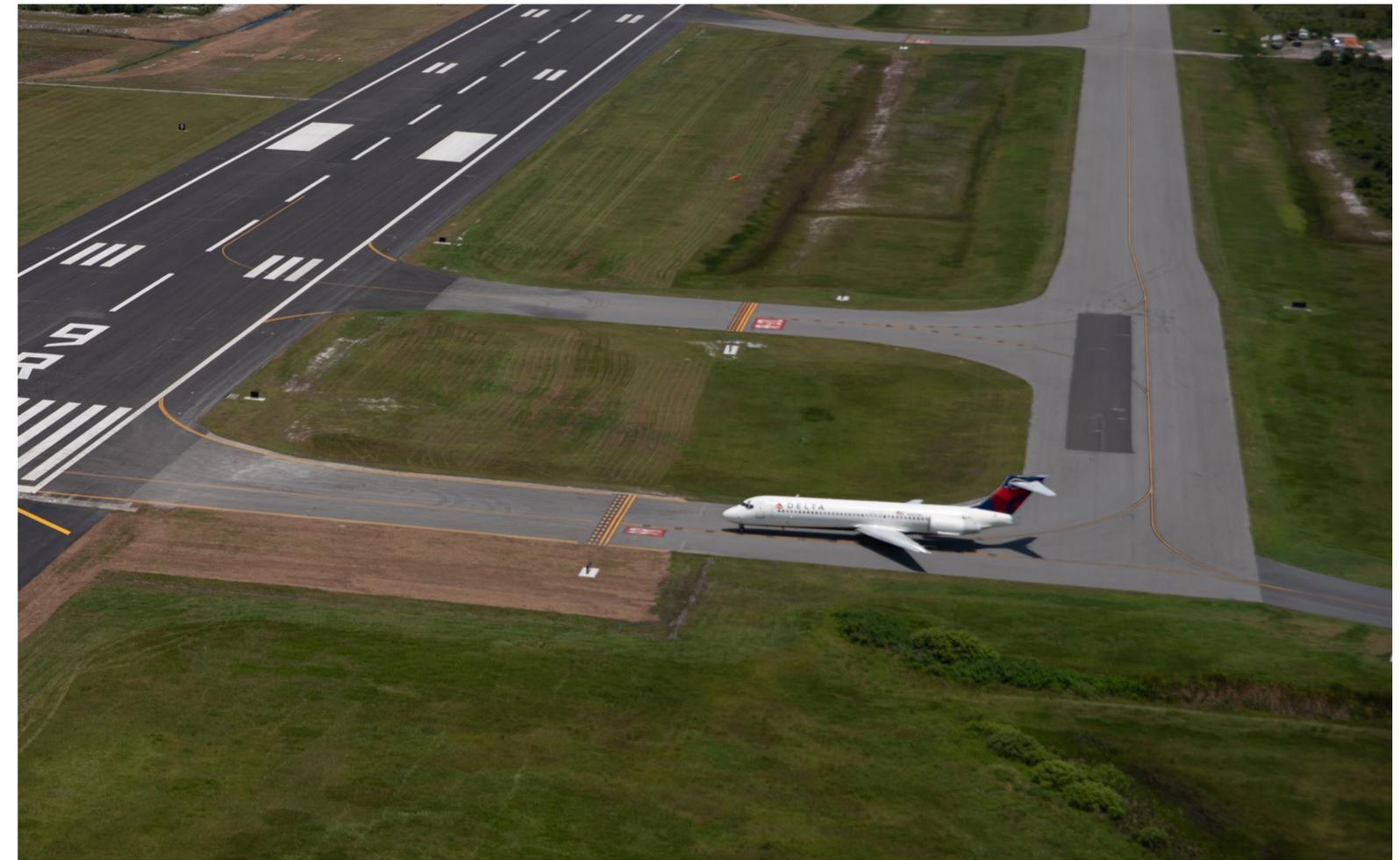
## Air Cargo Forecast

As noted, air cargo activity is not necessarily a required forecast element in an Airport Master Plan, however, at facilities that experience significant air cargo activity, adequate analysis should be provided. Forecasts of air cargo operations, equipment, and volume provide insight into apron requirements as well as vehicle access, auto parking, and other facilities. An example of air cargo forecasts prepared for the Tampa International Airport Master Plan is shown in **Table 14**.

**TABLE 14. AIR CARGO FORECAST FOR TAMPA INTERNATIONAL AIRPORT (IN TONS)**

Year	All-Cargo		Belly		Total		Grand Total
	Enplaned	Deplaned	Enplaned	Deplaned	Enplaned	Deplaned	
2011	33,651	42,870	8,928	10,443	42,579	53,313	95,892
2016	37,932	48,173	10,288	13,066	48,220	612,398	109,459
2021	41,324	52,482	11,285	14,332	52,609	66,814	119,423
2031	49,358	62,684	13,480	17,120	62,838	79,804	142,642
Average Annual Growth Factor							
2011-2016	2.42%	2.36%	2.88%	4.58%	2.52%	2.81%	2.68%
2011-2021	2.08%	2.04%	2.37%	3.22%	2.14%	2.28%	2.22%
2011-2031	1.93%	1.92%	2.08%	2.50%	1.97%	2.04%	2.01%

Source: Tampa International Airport Master Plan Update, 2012  
HCAA Monthly Report and HNTB Analysis



The previous sections of the Master Plan including stakeholder input, existing conditions, and forecasts come together in the Facility Requirements chapter of the Master Plan (see **Figure 14**). The Facility Requirements chapter includes analyses of what additional facilities would be required beyond the existing airport infrastructure to accommodate forecasted aviation activity as well as meet Federal, state, and local regulations, including FAA design standards, as well as incorporate impacts from emerging trends and stakeholder input. This analysis culminates in a summary of deficiencies and opportunities that is used to develop the recommended development plan.

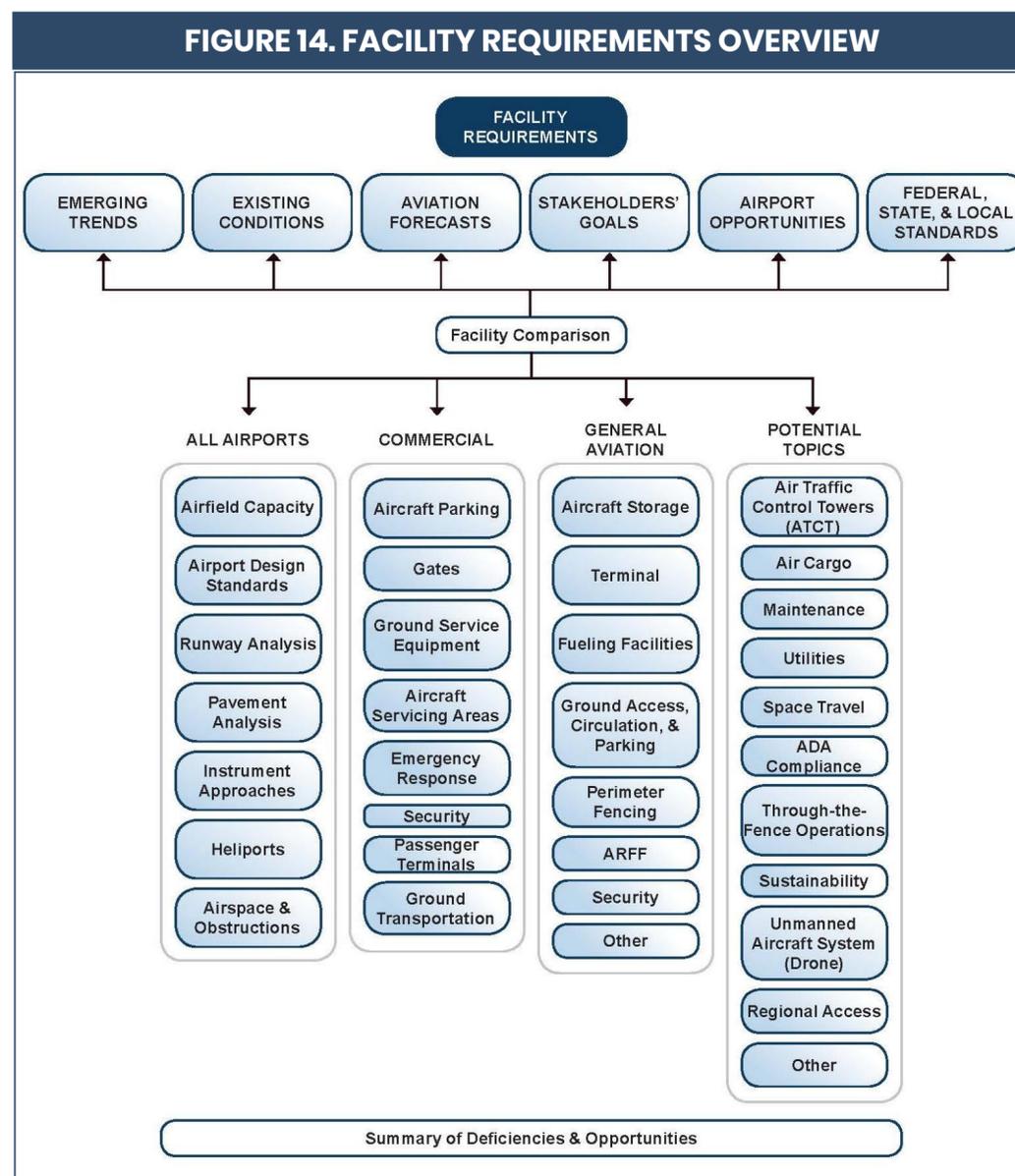
This chapter of the Guidebook identifies the suggested topics and tools for evaluating the airport’s facility needs and requirements using FAA, FDOT, and other Federal, state, and industry standards, resulting in the corresponding recommended development plan.

For planning purposes, airport facilities can be divided into two common terms: airside and landside. Airside facilities include areas used for aircraft operations such as runways, taxiways, aprons, ARFF, fueling facilities, and hangars; this area can also be referred to as the airfield. Landside facilities include most other areas such as ground access, employee and customer parking, hotel, and support facilities and equipment. Several planning components, such as security and passenger terminals, can comprise both airside and landside.

There can be a significant difference between the facilities needed for GA service airports versus commercial service airports. For example, commercial service airports are required to be certified under *14 CFR Part 139, Certification of Airports*, which applies to all airports providing scheduled commercial service utilizing aircraft with 10 or more seats. The requirements of Part 139 certification are based on the airport’s class and affects the overall facility requirements. A few airports that have a Part 139 certification, but do not have commercial service, still require certain facilities to maintain their certification. In addition, many commercial service airports have GA activities, services, and facilities; however, the extent and size of GA facilities can differ significantly at commercial service airports. While airside standards are more consistent between GA and commercial airports, landside facility requirements and guidance can vary widely. As such, this Guidebook has been structured to discuss planning standards and regulations applicable to all types of airports and those specific to commercial service versus GA airports separately.

This chapter addresses the following aviation facility requirement topics:

1. Emerging Trends
2. Airport Facility Planning
3. General Aviation Facility Planning
4. Commercial Airport Facility Planning
5. Other Potential Topics



**Emerging Trends**

Planners should be sure they are reviewing and applying emerging trends with the aviation and related industry. New technologies may affect capacity efficiency, facility geometry, or demand. Some trends may fall short, such as the proposed Very Light Jet (VLJ) revolution in the 2000’s that pressed airports to design facilities specific to those type of aircraft. While VLJs are used, the market did not expand as expected and some of the hangars built for these companies sat empty for many years before another tenant took over. Other trends such as Unmanned Aircraft Systems (UAS) or drones have become very popular in the commercial and recreational market. Presented below are a selection of current emerging trends that may need to be considered during the Master Plan process depending on their applicability to the individual airport. Below is

an introduction to some emerging trends that should be considered during any master planning process. More detailed information on these are provided in **Appendix 6**.

**Sustainability**

As it relates to airports, sustainability can be considered in the context of administration, procurement, planning, design, construction, maintenance, and operations. The FAA recommends reviewing *Interim Guidance and Lessons Learned for FAA’s Sustainable Master Plan Pilot Program and the ACRP Synthesis 10, Airport Sustainability Practices*.

FDOT’s *Airport Sustainability Guidebook* has been developed to lead Florida’s airports into a successful and sustainable future. To do so, the Guidebook was developed with a standardized methodology and guidance for developing an effective sustainability plan and implementing sustainability initiatives. The Guidebook was developed specifically for Florida’s airports and for use in educating and informing entities and individuals interested in sustainability including airport managers, airport authorities, local governments, and airport stakeholders and partners, both internal and external. To be as user-friendly as possible, the Guidebook was developed in two distinct sections: “Introduction to the Guidebook” and “Sustainability Planning.” Great effort was taken to make the Guidebook as flexible and customizable as possible. This was done with the intent of providing a resource for ALL Florida airports, not just airports that can afford to fund an entire stand-alone sustainability plan. The Guidebook can be found at <http://www.fdot.gov/aviation/sustainability.shtm>.

**NextGen**

The National Airspace System (NAS) is being modernized by the Next Generation Air Transportation System (NextGen). The FAA’s guide to NextGen can be found at <https://www.faa.gov/nextgen/>. Initiatives will affect flight plans and can have noise impacts, as well as impacts to navigation aids, airspace, airfield capacity, and obstruction management.



**ACRP Report 150 NextGen for Airports** provides guidance to help airports of all sizes plan for and incorporate NextGen capabilities. This report consists of several volumes plus a toolkit and other resources. The various documents help airports accommodate Next Generation Air Transportation System (NextGen) requirements while also taking advantage of the potential benefits of these federal programs designed to modernize the National Airspace System.

### Personal Use of Technology

The flying experience has been transformed to allow passengers to self-check-in via smart phones, pilots to obtain in flight weather on their tablet, and the community to know when there are construction delays on the roads to the airport via social media.

### Economics

Economic factors need to be considered in how they will affect future revenues and space requirements.

### Emergency Planning

Emergencies at airports go beyond terrorism concerns to events such as hurricanes that can destroy essential navigation equipment and disrupt services for weeks, the containment of infectious diseases such as the Ebola outbreak in 2014, Zika in 2016, or other events that would impact aircraft travel.

### Regional Access/Multi-Modal

Regional access to airports has been identified as a reoccurring problem across the nation as airports are not always considered in the regional transportation planning process. Viable multi-modal transportation options that connect GA and commercial airports to the regional system are needed as populations and flight activity increase and users look for alternative methods to travel.

### Unmanned Aircraft Systems (UAS)

The use of UAS (drones) has dramatically increased over the past several years into what many pilots and airport sponsors consider a safety hazard to the national airspace system. Due to the rapid proliferation of UAS' in the U.S., it is imperative that airports continue to monitor and track changes in the regulation and use of these systems. **ACRP Report 144 Unmanned Aircraft Systems (UAS) at Airports: A Primer** provides airports of all sizes with information about UAS and their potential use and impact on airports.

### Airport Facility Planning

#### Airfield Capacity

The purpose of an airfield capacity analysis is to determine if existing airfield facilities are sufficient to meet existing and future demand or if changes to these facilities are needed. Airfield capacity can be defined as either a measure of maximum sustainable throughput or as the number of aircraft operations that can be accommodated with a specified maximum average delay. Airfield capacity is determined based on the available airfield system and a range of airport characteristics including the types and numbers of aircraft operations. *FAA AC 150/5060-5, Airport Capacity and Delay* describes how to determine Annual Service Volume (ASV) and use that value to reasonably estimate the airport's annual maximum capacity, accounting for annual changes in weather, runway use, aircraft fleet mix, and other conditions. Hourly airfield capacity is the maximum number of aircraft operations that can take place at the airport in one hour, which is used in evaluating peak activity and is critical to the overall success of an airport. An airport must know their fleet mix and annual operations to determine capacity. For airports with higher operational activity levels or peaking issues, hourly capacity will be more important than ASV.

The FAA's current capacity AC was prepared in 1983; an update is currently underway. Analysis contained in *ACRP Report 79, Evaluating Airfield Capacity* as well as *ACRP Report 104, Defining and Measuring Aircraft Delay and Airport Capacity Thresholds*

provide more current information and identify current and newer airfield capacity evaluation tools, including a prototype airfield capacity spreadsheet model. The reports explain how to select the most appropriate airfield capacity tool for the airport's analysis.

The FAA's *runwaySimulator*, an airport capacity tool available from MITRE, can be used to determine airport capacity at major U.S. airports as well as assess capacity impacts of new improvements or flight procedures. The *runwaySimulator* model requires training from the FAA. This software tool will simulate throughput but may not necessarily provide an exact capacity value.

### Airport Design Standards

Airport design standards provide direction on how to design airports that promote safe activities. *FAA AC 150/5300-13A, Airport Design* contains extensive information regarding design standards for every airport type based on FAA guidance. Design standards are included for runways, taxiways, safety areas, as well as many others. Due to the number of standards in the AC, planners are advised to review the AC for all topics for the applicability to their planning study. It is important that the most current version of the AC is reviewed to ensure that the most current design standards are utilized during the facility requirements analysis.

The FAA uses the Aircraft Approach Category (AAC), Airplane Design Group (ADG), and the visibility minimums of an airport's design aircraft to classify individual runways. When combined, these three elements comprise the Runway Design Code (RDC); for example, C-III-1600. The design aircraft, identified as part of the forecasting process, has at least 500 annual operations at the airport. The AAC is based on the design aircraft's speed during the landing approach. The ADG is based on the wingspan and tail height of the design aircraft, whichever is more restrictive. The visibility is listed as the Runway Visibility Range (RVR) and is based on the lowest approach visibility minimums for that runway. The RDC, minus the visibility component, determines the Airport Reference Code (ARC). The most demanding RDC would be considered the ARC. **Table 15** lists the specifications associated with the RDC from the FAA AC.

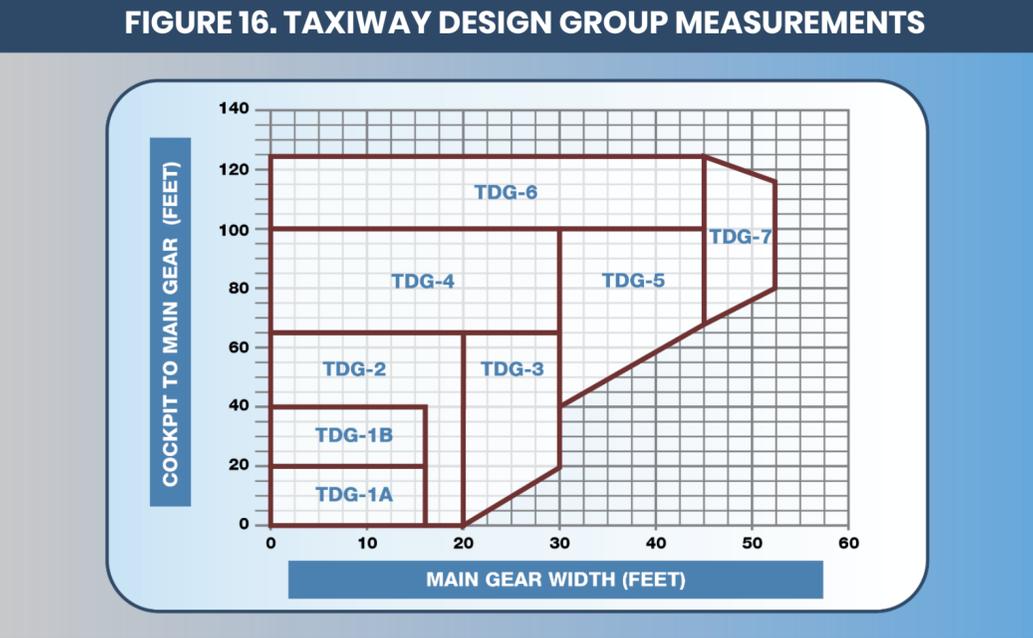
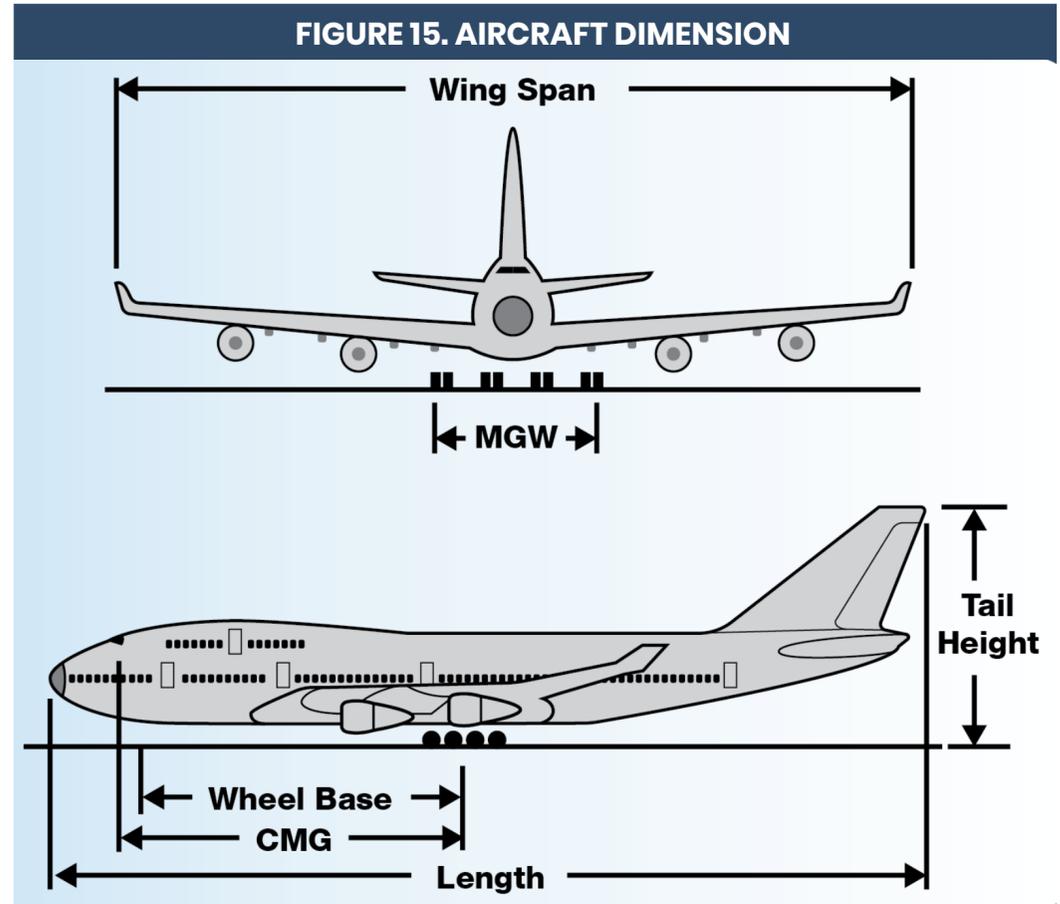


**TABLE 15. RUNWAY DESIGN CODES**

Runway Design Code (RDC)						
Aircraft Approach Category (AAC)		Airplane Design Group (ADG)			Flight Visibility	
Category	Speed (kts)	Group	Wingspan	Tail Height	RVR (ft)	Approach Minimums (sm)
A	Less than 91	I	Up to 48'	<2 0'	5000	Not lower than 1 mile
B	91 to 120	II	49' to 78'	20' - < 30'	4000	<1 & > ¼
C	121 to 140	III	79' to 117'	30' - < 45'	2400	< ¾ & > ½
D	141 to 165	IV	118' to 170'	45' - < 60'	1600	< ½ & > ¼
E	166+	V	171' to 213'	60' - < 66'	1200	< ¼
-	-	VI	214' to 261'	66' - <80'	-	-

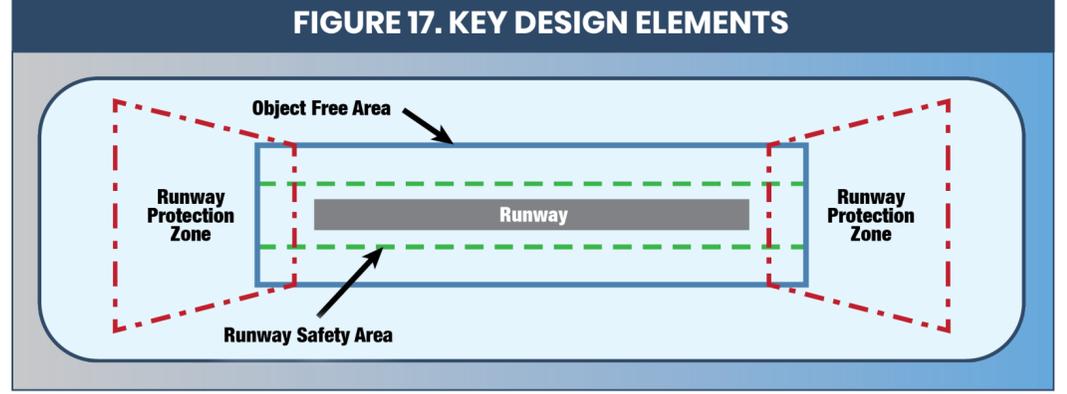
Source: FAA AC 150/5300-13A, Airport Design

The Taxiway Design Group (TDG) is a classification of the aircraft dimensions—the width of the main gear (MGW) and Cockpit to Main Gear (CMG) distance as shown in **Figure 15** and **Figure 16**, below. CMG is typically used for commercial aircraft when the nose is in front of the nose gear; the wheelbase is used for smaller aircraft when the cockpit is behind the nose gear. Taxiways are designed to allow for oversteering, thus pavement angles and edges (fillets) must provide a large enough margin for safety while turning.



Once identified, the RDC and TDG are used to signify the design standards to which the runway should be constructed or maintained. A summary of these design standards is provided below and visually depicted in **Figure 17**. Key design standards include:

- **Object Free Area (OFA)** – An area centered on the ground on a runway (ROFA), taxiway (TOFA), or taxilane (TLOFA) centerline provided to enhance the safety of aircraft operations by remaining clear of objects (roads, buildings, etc.), except for objects that need to be located in the OFA for air navigation or aircraft ground maneuvering purposes.
- **Obstacle Free Zone (OFZ)** – An area centered on the runway (ROFZ) that extends 200 feet from the runway end and must be cleared during operational use of all objects except those located there due to their function. The ROFZ is based on the approach minimums of the runway end. A Precision OFZ (POFZ) also applies to airports with vertically-guided approaches.
- **Runway Protection Zone (RPZ)** – An area at ground level prior to the threshold or beyond the runway end that enhances safety and protects people and property on the ground. The FAA often pursues ownership of this area through title or easements to ensure control. The acreage not controlled or containing obstructions should be evaluated for control.
- **Runway Safety Area (RSA)** – A defined surface surrounding the runway prepared or suitable for reducing the risk of damage to aircraft in the event of an undershoot, overshoot, or excursion from the runway. Area must be capable of supporting necessary objects and equipment such as navigational aids (NAVAIDs) and snow removal. FAC Rule 14-60.007, *Airfield Standards for Licensed Airports* also requires airports to adhere to certain design standards for the safety area length and width.
- **Centerline Separation** – The required distance between the runway/taxiway/taxilane and other objects including adjacent runways, taxiways, and taxilanes based on the required wingtip clearance.



The Runway Design Standards Matrix in Appendix 7 of FAA AC 150/5300-13A, *Airport Design* can be used to determine the dimensions for these standards. Table 6-1 of the AC lists the facilities designated as “fixed-by-function” and thus allowed to be located within the RSA and ROFA.

Other design standards to note include:

- **Runway Visibility Zone (RVZ)** – Is reviewed when there is more than one runway in use. The RVZ is a defined area with a clear line of sight between two intersecting runways and comprises imaginary lines between designated points. This ensures pilots can safely see both the runway on which they are operating as well as other runway(s).
- **NAVAIDs** – Require certain clearance areas to ensure proper operation. For example, any structures within 500 feet of an automated surface observing system (ASOS) should be at least 15 feet below the antenna height and a segmented circle needs to be visible for pilots to note wind direction. While an Instrument Landing System (ILS) is in use, no vehicles or aircraft may be within the ILS critical area.
- **Building Restriction Line (BRL)** – Indicates the limit of where airport buildings should be located to provide proper clearance for the airfield and its associated geometric and airspace clearances. The BRL is typically calculated based on the Part 77 Imaginary Surfaces for a 35-foot high building.

**Runway Analysis**

There are several factors of the runway system that need to be analyzed to ensure the airport is able to meet safety and design standards. These include the orientation of the runways, length and width, strength, and navigational aids.

Per FAA AIP Handbook, only a single runway will be funded at an airport unless the FAA ADO has determined the secondary or crosswind runway is justified. This can be justified when a single runway does not provide 95% wind coverage.

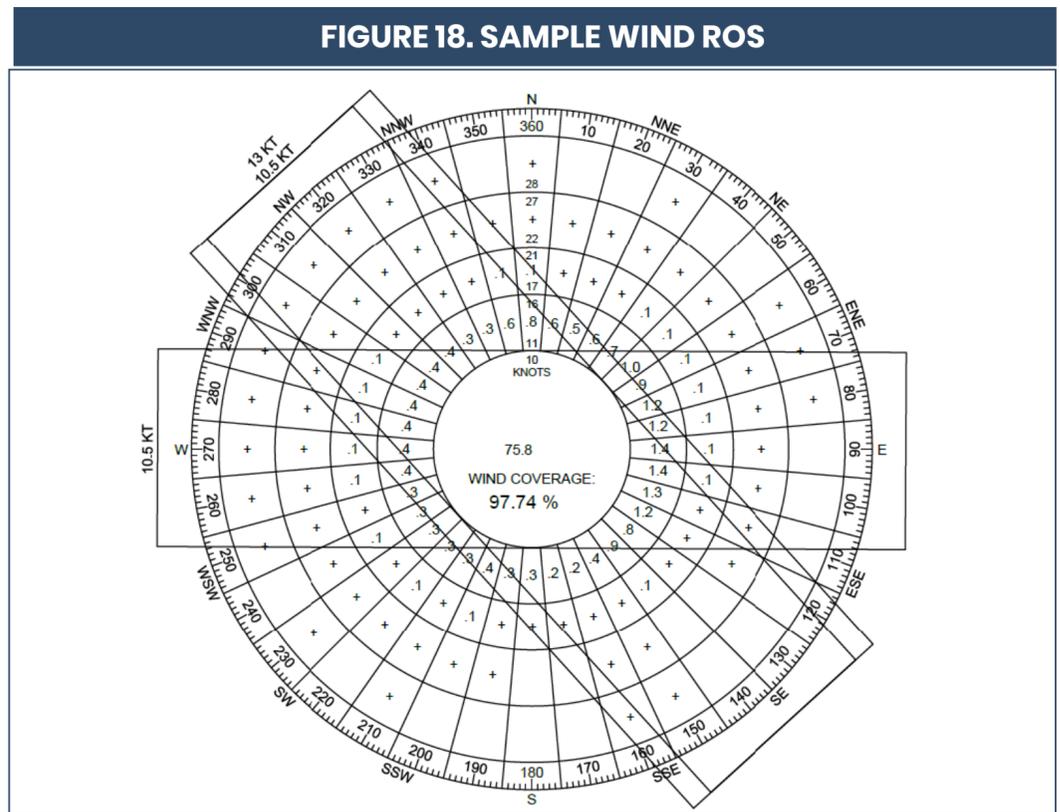
**Orientation**

Wind speed and direction are key factors in determining runway orientation and the number of runways at an airport. Runways should ideally be oriented to the direction of the prevailing winds to allow aircraft to take off and land in the direction of the wind. Per Appendix 2 of FAA AC 150/5300-13 *Airport Design*, the FAA’s desired wind coverage for an airport is 95% between one or multiple runways with the allowable crosswind

component based on the RDC. When a single runway cannot provide enough wind coverage, a second runway should be considered.

The wind data needed to perform the analysis can be obtained from the FAA’s **Airports Geographic Information System**. Once wind data has been downloaded for an airport, it can be entered into the wind analysis tool located at the same web address. Additional wind and weather information can be obtained from the **National Oceanic and Atmospheric Administration (NOAA), National Centers for Environmental Information**. When the wind data is not available for a specific airport, a discussion regarding using data from nearby airports with similar conditions should be held with the FDOT and FAA ADO.

AC 150/5300-13A provides information on the calculations and assumptions for the wind analysis behind the software program. The wind roses for the applicable conditions are required to be shown in the ALP. A sample wind rose is shown in **Figure 18**.



**Length and Width**

The design aircraft for each runway determine runway length and width requirements. Runway width is based on the RDC as presented in the Runway Design Standards Matrix in FAA AC 150/5300-13A Airport Design. FAA AC 150/5325-4B, Runway Length Requirements for Airport Design describes the process for determining recommended lengths. “Runway Length Curves,” which consider conditions such as airport elevation, average maximum daily temperature, wet or dry conditions, and runway gradient and can be used to determine the recommended length. There are several known shortcomings to the methodologies presented in this AC. Consequently, the FAA is currently in the process of developing new guidance that will eventually be presented in a draft AC.

In the interim the FAA recommends that planners also consider the use of Aircraft Flight Manuals and performance engineering data, especially in cases dealing with obstacles/terrain and hot or high altitudes.

Additionally, aircraft operating under Federal Aviation Regulations (FAR) Part 135, charter operators, or FAR Part 119, air carriers and commercial operators, may have additional mandates imposed by their company for safety reasons. This may include a minimum runway length or approach visibility minimums based on the passenger and fuel loads and meteorological conditions. As such, planners should discuss runway length requirements with airport stakeholders regarding specific requirements for aircraft regularly utilizing the airport.

FAC 14-60 provides the following minimum landing area dimensions (shown in **Table 16**) in addition to the FAA AC guidance.

Landing Area Type	Effective Landing Area Length	Minimum Landing Area Width
Runway	2,400 feet	60 feet
Short Field Runway	800 feet	60 feet
Ultralight	300 feet	150 feet
Seaplane*	2,500 feet	200 feet
Helipad	24 feet	24 feet

\*Seaplane landing areas shall have a minimum water depth of three feet. Source: FAC 14-60

Declared distances, per FAA AC 150/5300-13A Airport Design, represent the maximum distances of the runway available and suitable for meeting takeoff, rejected takeoff, and landing distance performance requirements for turbine powered aircraft as approved by the FAA. Declared distances can satisfy design standards without limiting the physical runway length. Declared distances are for each individual runway end by reviewing the existing safety areas, object free areas, and runway protection zone requirements beyond the paved runway. The available distances are “reduced” on paper only by utilizing runway pavement to satisfy safety areas; no physical markings are indicated on the pavement. Sponsors may contact the FAA Orlando ADO or FDOT Aviation Office for applicability and assistance on establishing declared distances.



**Lighting, Markings, and NAVAIDs**

Lighting, markings, and NAVAIDs allow aircraft to operate safer in all weather conditions, especially during nighttime and low visibility conditions. Airport markings should be reviewed to ensure they are up-to-date, compliant with FAA AC 150/5340-1M, Standards for Airfield Markings and FAC Rule 14-60.007, and in good condition. FAC Rule 14-60.007 requires at least one windsock to be at the airfield plus additional requirements for segmented circles for non-towered airports.

FAA AC 150-5340-30J, Design and Installation Details for Airport Visual Aids is a non-mandatory guide relating to airport visual aids’ siting requirements, design, installation, and maintenance. The need for additional NAVAIDs and lighting such as Visual Glideslope Indicators (VGSi) or weather systems should be reviewed based on pilot needs and instrument approaches that help pilots identify runway thresholds. Additional ACs are available for details on various NAVAIDs and lighting.

**Turf Runways**

Specific aircraft, such as taildraggers, prefer turf runways. Some pilots may also prefer turf runways due to reduced cost or mere personal preference. These runways can be used at low volume airports with lightweight aircraft. Turf runways are required to adhere to the same FAA and State design standards and regulations as a paved runway including safety areas and Part 77 surfaces. As such, any analysis or development of a turf runway should comply with FAA AC 150/5300-13A Airport Design and FAC 14-60. **Table 17** provides a list of the Landing and Surfaces Area per FAC 14-60 for a turf runway.

Landing Area		Primary Surface		Approach Surface			Transitional Surface		
Surface	Approach	Length	Width	Ratio	Length	Width		Ratio	Distance
						Inner	Outer		
Not Paved	Visual	End of Runway	250 feet	20:1	5,000 feet	250 feet	1,250 feet	N/A	N/A



### Pavement Strength

Before the widespread use of PCN in recent years, pavement strength in the U.S. was reported as a single number expressed in pounds based on the landing gear configuration of the aircraft. It displayed the weight of an aircraft that could safely and regularly use the pavement. Per FAA guidance, and for consistency with International Civil Aviation Organization (ICAO) standards, airport pavement strength is reported by Pavement Classification Number (PCN) which expresses the relative load carrying capacity of a pavement. The PCN value is calculated based on the pavement system's cross-section (i.e., type and thickness of surface and base courses), underlying subgrade condition, and aircraft activity level (i.e., volume of operations by aircraft type).

#### Florida Specific Information!

When preparing the Scope of Work (SOW) for any runway rehabilitation or reconstruction project, the Scope must include a provision to recalculate the PCN for that pavement.



Similarly, an Aircraft Classification Number (ACN) can be calculated for specific aircraft models. The ACN is a single, unique number expressing the relative effect of an aircraft on a pavement. It is based on both aircraft characteristics (i.e., weight and landing gear configuration) and specified pavement characteristics (i.e., type, subgrade strength, thickness).

The PCN and ACN values can then be used by pilots and airport personnel to evaluate whether the airfield pavement is acceptable for regular use by specific aircraft. The PCN/ACN methodology is structured so that a pavement with a certain PCN value can support, without restrictions, all aircraft that have an ACN equal to or less than the reported PCN value. To prevent pavement damage and ensure the lifespan of the pavement, the ACN of aircraft using the pavement should not typically exceed the PCN of the pavement. This does not mean, that use of the pavement by an aircraft with a larger ACN will cause pavement failure. Rather, there are situations where occasional

use by larger aircraft is acceptable, but regular occurrences could reduce the lifespan of the pavement or degrade the overall PCN.

Based on the design aircraft, the airport should determine the required pavement design strength or weight bearing capacity of all pavement areas including runways, taxiways, and aprons. Strength is based on the load distribution of aircraft from their landing gear type and geometry. Pavement strength is determined by aircraft expected to use the airport and not based on a single activity; for example, a heavier aircraft may use a lower strength pavement for limited operations if determined feasible.

While pavement naturally deteriorates over time, routine maintenance such as crack sealing, surface treatments, or patches will extend the life of the pavement at lower costs than deferring maintenance until substantial pavement rehabilitation may be needed. Pavement Condition Index (PCI), which is an examination of specific distress type and severity combined with historical PCI data and rehabilitation efforts. More details on PCI are discussed in the Pavement Maintenance section. FAA AC 150/5320-6F *Airport Pavement Design and Evaluation* provides details on design and load distribution.

#### Federal Grant Assurance #19 states:

The airport and all facilities which are necessary to serve the aeronautical users of the airport, other than facilities owned or controlled by the United States, shall be operated at all times in a safe and serviceable condition and in accordance with the minimum standards as may be required or prescribed by applicable Federal, state and local agencies for maintenance and operation

### Pavement Maintenance

While the Federal grant assurances require sponsors to maintain a safe operating airfield including runways, taxiways, and aprons, FDOT has a longstanding initiative to monitor the condition and lifespan of airport pavement. Pavement condition is a major safety component at an airport as it directly impacts the capability of the runway surface to provide a suitable environment for maintaining aircraft directional control. Pavement in poor condition can damage aircraft through prop strikes or foreign object debris (FOD) being swept up from the ground into an aircraft. It is also important to maintain pavement regularly as repairs become costlier the longer maintenance is deferred. The Statewide Pavement Inspection Program schedules inspections on a three-year cycle at no cost to the airport; for more information, visit the [FDOT Airfield Pavement Management website](#).

#### Florida Specific Information!

FAC Rule 14-60.007, *Airfield Standards for Licensed Airports* details the Pavement Condition Index (PCI) that values the condition of the pavement in order to maintain the airport's license



FAC Rule 14-60.007, *Airfield Standards for Licensed Airports* details the Pavement Condition Index (PCI) that values the condition of the pavement in order to maintain the airport's license (Table 18 and Figure 19). PCI values range from 0 (Failed) to 100 (Excellent). Pavement can be assessed following the [American Society of Testing Material ASTM Standard D 5340, Standard Test Method for Airport Pavement Condition Index Surveys](#). The results of the PCI, along with the associated maintenance, rehabilitation needs, and

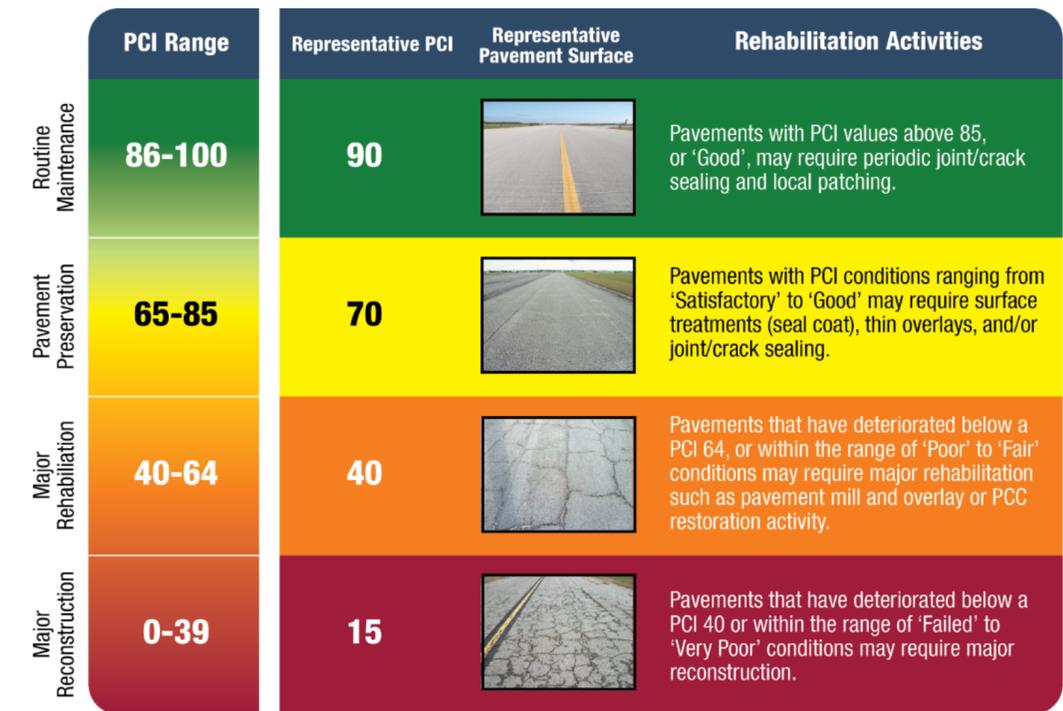
costs, are compiled into FDOT's Statewide Airfield Pavement Management Program (SAPMP) Update, available at: [www.fdot.gov/aviation/pavementManagement.shtm](http://www.fdot.gov/aviation/pavementManagement.shtm)

TABLE 18. PAVEMENT CONDITION INDEX

Qualitative Rating	PCI Value	
	Minimum	Maximum
Excellent	86	100
Very Good	71	85
Good	56	70
Fair	41	55
Poor	26	40
Very Poor	11	25
Failed	0	10

Source: FAC Rule 14-60.007, *Airfield Standards for Licensed Airports*

FIGURE 19. VISUAL REPRESENTATION OF PCI RATINGS FROM THE SAPMP UPDATE



Source: Statewide Airfield Pavement Management Program (SAPMP) Update, 2015

The SAPMP recommends completing a major pavement rehabilitation, such as runway reconstruction or mill and overlay, when a pavement section has deteriorated below the Critical PCI value or when Section PCI has load-related PCI distresses. The objective of a major rehabilitation is to "reset" the PCI value to 100. The level of rehabilitation based on the PCI index and example costs are provided

in the Table “Major Rehabilitation by Condition.” Maintenance and Repair (M&R) will help extend the life of the pavement and includes activities such as crack sealing and patching.

FDOT has three publications to assist with Pavement Management: *Airfield Pavement Distress Repair Manual*, *Airfield Pavement Inspection Reference Manual*, and *Inspection Methodology for Whitetopping*. These are available at: [www.fdot.gov/aviation/flpub.shtm](http://www.fdot.gov/aviation/flpub.shtm).

The Inspection Manual details the different types of distress that can be found in the pavement and how to rate them and includes the survey data sheets for flexible pavement and jointed rigid pavements.

### Taxiway System

The taxiway system provides safe access to and from the runways and landside areas. As discussed previously, taxiways are designed for the TDG but the overall system also needs to be reviewed to ensure there are no “hot spots” that could lead to runway incursions and adequate access is provided to all areas. All airfield movement, including aircraft, pedestrians, and vehicles, must be analyzed.

As new taxiway and taxiway fillet designs were added with the change to FAA AC 150/5300-13A, *Airport Design* in 2012, all airfields should be reviewed for compliance. The AC provides the following guidance that requires discussion with frequent users of the airport:

- Eliminate “judgmental oversteering” to allow pilots to use a consistent taxi method throughout the airport.
- Design taxiways so nose gear steering angle is no more than 50 degrees.
- Simplify taxiway intersections by ensuring pilots do not have more than three options at any intersection.
- Design turns to be 90 degrees when possible to increase visibility.
- Reduce possibilities of runway incursions by avoiding non-recommended taxiway designs, wide expanses of pavement, and “dual-purpose” pavement; and limiting runway crossings and direct access without turns from an apron to a runway.

GA airports typically have at least one full-length parallel taxiway to reduce “back-taxiing” and runway crossings.

### Instrument Approaches

Standard Instrument Approach Procedures (SIAPs) are established and controlled by the FAA to help aircraft land at specific runway ends, especially during inclement weather. If an airport has no instrument approach, approaches are categorized as visual, although there could be a circling approach that does provide some capability to the airport. **Airports considering adding an instrument approach should be aware that doing so may impact other design elements at the airport, such as approach surfaces and the width of the primary surface.** The following three types of instrument approaches are available:

- Precision Approach (PA) – Provides lateral and vertical guidance (ILS and military approaches)
- Approach with Vertical Guidance (APV) – Provides vertical guidance to decision altitude with lateral guidance (Localizer performance with vertical guidance (LPV), Lateral navigation (LNAV)/Vertical navigation (VNAV))
- Non-Precision Approach (NPA) – Provides only lateral guidance (Localizer performance (LP), LNAV, Localizer approach (LOC), Very High Frequency Omni Directional Range (VOR))



#### Remember!

Adding or changing approaches can result in additional design impacts that could result in unintended consequences that can impact the entire airport.

Area Navigation (RNAV) is the overall terminology used for approaches that use the GPS Wide Area Augmentation System (WAAS). Due to technological advances, RNAV approaches are now defined specifically as LPV, LP, LNAV, and others. These RNAV approaches are being implemented as part of the NextGen Performance Based Navigation (PBN) initiative.

As precision approaches provide more exact information they are more desirable; however, they also require additional equipment, funding, and larger safety and protection areas for the airport. Approaches with vertical guidance are an option for airports that desire more exact information but are not able to provide a full precision approach with lateral guidance.

Each individual instrument approach procedure at an airport also has an associated visibility minimum. As previously noted, the visibility minimum is also expressed in terms of a runway visual range (RVR) in the identification of a runway design code (RDC). Airports should review the approach procedure needs during the Master Plan and compare them to standards associated with different visibility minimums as identified in FAA AC 150/5300-13A *Airport Design* in Table 3-4 (page 90). Typically, as the minimums are reduced, the infrastructure requirements and safety areas such as the RPZ increase.

The full impact of lower minimums should be analyzed prior to a Master Plan recommendation to ensure the airport does not install navigational equipment that cannot be utilized because the RPZ now extends over residential property or the sponsor cannot ensure the approach is clear of obstructions. An FAA memorandum from August 8, 2015 (<https://www.faa.gov/airports/engineering/media/policy-reminder-protecting-approach-and-departure-surfaces.pdf>) was written to

remind the FAA staff and airport sponsors of their responsibility in protecting the approach and departure surfaces by ensuring they remain clear of obstructions.

Specific weather system requirements are based on the type of approach and should be discussed with the FAA. The main two systems are the Automated Weather Observing System (AWOS) and the Automated Surface Observing System (ASOS). The AC standards should be utilized as a baseline, but it is recommended to discuss current technology and requirements with the FAA and FDOT when recommending a new approach procedure as part of the Master Plan.

### Heliports

Heliports are designed for rotary aircraft operations and can be stand-alone entities or located at an airport. On-airport heliports may have their own dedicated apron and facilities or be located on the GA apron area. FAA AC 150/5390-2C, *Heliport Design* and FAC 14-60, *Airfield Standards for Licensed Airports* provides design standards for heliports. While these basic concepts can be applied to helicopters with tandem or dual rotors, the standards apply only to single rotor.

The dimensions of the heliports and helicopter parking locations are based on the diameter of the rotors and utilize similar procedures of takeoff, landing, and taxiing as fixed wing aircraft. The heliport consists of an inner, square area referred to as the Touchdown and Liftoff (TLOF) and an outer, square known as the Final Approach and Takeoff Area (FATO); the minimum landing area should be 24 feet by 24 feet. Heliports must also adhere to Part 77 surfaces and pavement standards. **Table 19** provides a list of the Landing and Surfaces Area per FAC 14-60 for helipads.

**TABLE 19. LICENSED AIRPORTS – LANDING AND SURFACE AREAS FOR HELIPADS**

Landing Area		Primary Surface		Approach Surface				Transition Surface	
Surface	Approach	Length	Width	Ratio	Length	Width		Ratio	Distance
						Inner	Outer		
Helicopter Final Approach and Takeoff Area (FATO)	Visual	42 feet	42 feet	8:1	4,000 feet	42 feet	500 feet	2:1	250 feet Vertical
	Non Precision	500 feet	500 feet	34:1	10,000 feet	500 feet	500 feet	4:1	350 feet Vertical
	Precision	1,000 feet	1,000 feet	50:1	25,000 feet	1,000 feet	1,000 feet	7:1	350 feet Vertical

Source: FAC 14-60

Engaging helicopter users during the Master Plan is especially important as they typically offer more specialized services such as emergency response, which can have additional requirements such as quick roadway access for ambulances or close access to firefighting water buckets.

**Airspace and Obstructions**

The 14 CFR FAR Part 77 Safe, Efficient Use, and Preservation of the Navigable Airspace requires FAA notice for certain proposed construction or alteration of existing structures, establishes standards and processes used to determine obstructions, and identifies the process to petition the FAA to review determinations. The FAA utilizes Obstruction Evaluation/Airport Airspace Analysis (OE/AAA) to conduct aeronautical studies to administer this CFR through the use of FAA Form 7460-1, **Notice of Proposed Construction or Alteration**. FDOT established Airport Notification Areas to visually display when proposed development needs to be reviewed by the FAA through the OE/AAA process and needs to be permitted by FDOT.

Part 77 standards are commonly referred to as “Imaginary Surfaces” and include the Primary Surface, Horizontal Surface, Conical Surface, Transitional Surface, and Approach Surfaces. Dimensions are based on the type of runway and approaches to the runway ends (Table 20 and Figures 20 and 21). These surfaces should be evaluated for penetrations and detailed findings included in the ALP drawing set. TRB’s **ACRP Report 38, Understanding Airspace, Objects, and Their Effects on Airports** provides additional information on the regulations, standards, evaluation criteria, and processes associated with Part 77. These surfaces are the basis for the areas local municipalities are required to protect per **Chapter 333, F.S.**

Order 8260.3D, *U.S. Standard for Terminal Instrument Procedures (TERPS)* provides details on formulating, reviewing, approving, and publishing procedures for instrument flight operations. Modifications or requests for new instrument approaches should be handled through the FAA. The TERPS includes other surfaces to be considered such as the Threshold Siting Surface (TSS) and the Glidepath Qualification Surface (GQS).

The August 8, 2015 FAA Memorandum was released to remind FAA staff and airport sponsors their responsibility for protecting approach and departure surfaces per *FAA AC 150/5300-13A, Airport Design, FAA Order 8260.3D TERPS*, and Grant Assurances 19 (Operations and Maintenance), 20 (Hazard Removal), 21 (Compatible Land Use), and 29 (ALP). The FAA ADO should aid the sponsor to plan and implement projects for obstruction removal as well as proactively remind sponsor of their obligation.

**Florida Specific Information!**



Airspace standards contained in FAC Rule 14-60.007, *Airfield Standards for Licensed Airports* do not always match FAA standards. As a result, conflicts regarding obstacle disposition and the need for runway threshold displacements can and do occur.

FAA AC 70/7460-1L *Obstruction Marking and Lighting* includes the standards for marking and lighting structures to promote aviation safety.

Additional information provided by the FDOT on airspace obstructions, notification, and marking can be found at: [www.fdot.gov/aviation/flpub.shtm](http://www.fdot.gov/aviation/flpub.shtm), including Chapter 333 F.S. Airport Zoning and Rule 14-60.009 FAC Airspace Protection.

**Remember! Obstacle Action Plan (OAP)**

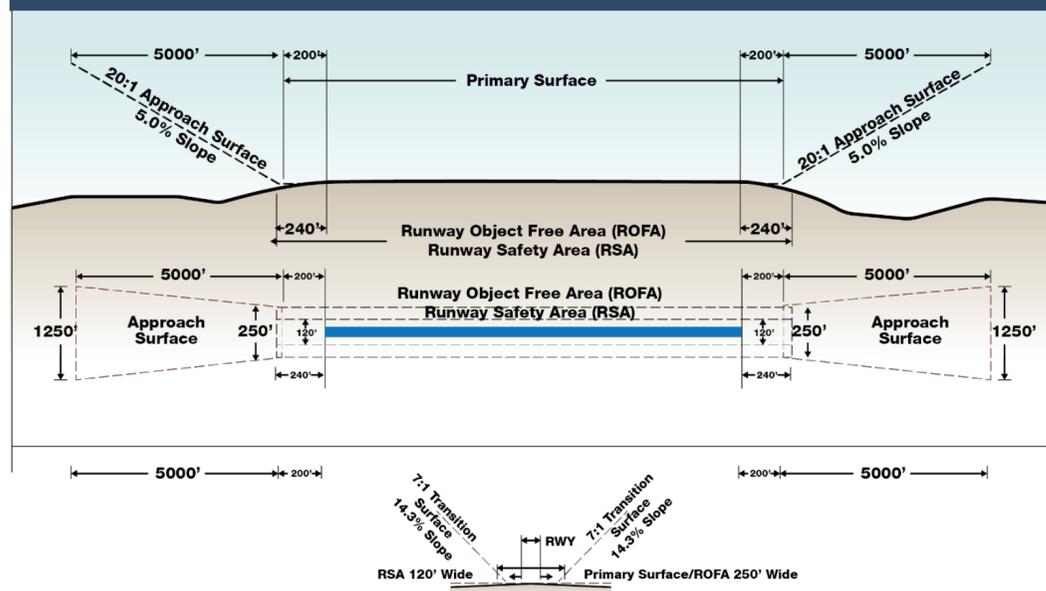
The airport sponsor is ultimately responsible for ensuring clear runway approach and departure surfaces. To facilitate compliance, the FAA is starting to require airport sponsors to develop an Obstacle Action Plan (OAP) that address the sponsor’s action plan to maintain clear surfaces per **FAA Memorandum** dated August 18, 2015.

**TABLE 20. PART 77 SURFACE DIMENSIONS**

Item	Dimensional Standards (Feet)					
	Visual Runway		Non-Precision Instrument Runway			Precision Instrument Runway
	Utility	Non-Utility	Utility	Non-Utility		
				>3/4 Vis	<3/4 Vis	
<b>Width of Primary Surface and Approach Surface Width at Inner End</b>	250	500	500	500	1,000	1,000
<b>Radius of Horizontal Surface</b>	5,000	5,000	5,000	10,000	10,000	10,000
	Visual Approach		Non-Precision Instrument Approach			Precision Instrument Approach
	Utility	Non-Utility	Utility	Non-Utility		
>3/4 Vis				<3/4 Vis		
<b>Approach Surface Width at End</b>	1,250	1,500	2,000	3,500	4,000	16,000
<b>Approach Surface Length</b>	5,000	5,000	5,000	10,000	10,000	*
<b>Approach Slope</b>	20:01	20:01	20:01	34:01	34:01	*

\*Precision Instrument Approach Slope is 50:1 for inner 10,000 feet and 40:1 for an additional 40,000 feet  
Source: [www.ngs.noaa.gov/AERO/ois/spec.html](http://www.ngs.noaa.gov/AERO/ois/spec.html)

**FIGURE 20. FAA DEFINED SAFETY AREAS AND IMAGINARY SURFACES**



Source: Adapted from the Trinity County Pilots Association, 2016

regulations, and maintain aircraft safety due to different sizes and limitations. GA airports also only need to address their specific needs, which will differ greatly depending on airport size and activity type.

There are several resources providing guidance for GA landside facilities including FAA AC 150/5300-13A, *Airport Design, Appendix 5, General Aviation Aprons and Hangars*, TRB's **ACRP Report 113, Guidebook on General Aviation Facility Planning**, and various industry standards.

**Aircraft Storage**

Aircraft storage is typically provided either outdoors, such as an apron with tie-downs, or in a type of hangar facility. Generally, every based aircraft needs a storage space. Additional storage is needed for itinerant aircraft that arrive and need to be accommodated short-term (e.g., hours) or long-term (e.g., several weeks or months). Storage needs can be estimated based on the current and forecasted aircraft fleet mix as well as through discussions with airport users. Aircraft owners may have different storage preferences based on the value of the aircraft, hangar rental costs, weather, and other needs. TRB's ACRP Report 113, *Guidebook on General Aviation Facility Planning* provides extensive information on sizing, spacing, and typical layouts of aircraft storage. The National Fire Prevention Association (NFPA) 409, *Standard on Aircraft Hangars* should also be consulted for any applicable requirements such as fire suppression and clearance distances.

Aircraft storage options include:

- **Conventional Hangar**
  - Also known as box, corporate, storage, or executive hangars depending on the exact configuration and amenities. Conventional hangars can be built to any size needed, for one or multiple aircraft of various sizes, with amenities such as office space or sleeping quarters.
- **T-Hangar**
  - The two most common types of T-Hangars are standard and nested. Standard T-Hangars tend to be longer and narrower and are appropriate when available property is limited. Nested T-Hangars can optimize the developable space and reduce pavement needs (**Figure 22**). FDOT released the *Design Guidelines and Minimum Standard Requirements for T-Hangar Projects in 2013*, available at: [www.fdot.gov/aviation/flpub.shtm](http://www.fdot.gov/aviation/flpub.shtm)

• **Tiedowns/Aircraft Apron**

Landside aprons are used for parking aircraft based at the airport, transient aircraft, as well as staging areas for other hangars. Tiedown locations must be examined using airside requirements such as taxiway/taxilane safety areas or centerline separation standards. Tiedowns are most commonly used by single-engine aircraft but can be designed for any aircraft size or use, including helicopters. Discussions with airport staff and users will help determine the number of based aircraft that would utilize tiedowns. The number of tiedowns required for transient GA aircraft should be based on the itinerant operations forecast and fleet mix. Typically, it is estimated that 25% of itinerant landings will need apron tiedown parking.

**Terminal**

At GA airports, the terminal may be located at an FBO building, a separate passenger terminal building, and/or an administrative building depending on airport size, facilities, and users. Amenities may include restrooms, pilot lounges and planning areas, shopping, vending, restaurants, conference rooms, administration offices, rental or courtesy cars, and passenger facilities. *ACRP Report 113, Guidebook on General Aviation Facility Planning* provides the following formula for planning the size for a GA terminal building and initial-cost estimating:

$$(\text{peak-hour operations}) \times 2.5 \times (110 \text{ sf to } 150 \text{ sf}) = \text{building square footage}$$

The 2.5 considers an average number of pilots and passengers per peak-hour operation. This calculation does not consider other needs (e.g., sidewalks, patios, landscaping, and parking) and thus yields merely an estimate. Each airport must consider its GA terminal needs based on existing and projected activities.

**Fueling Facilities**

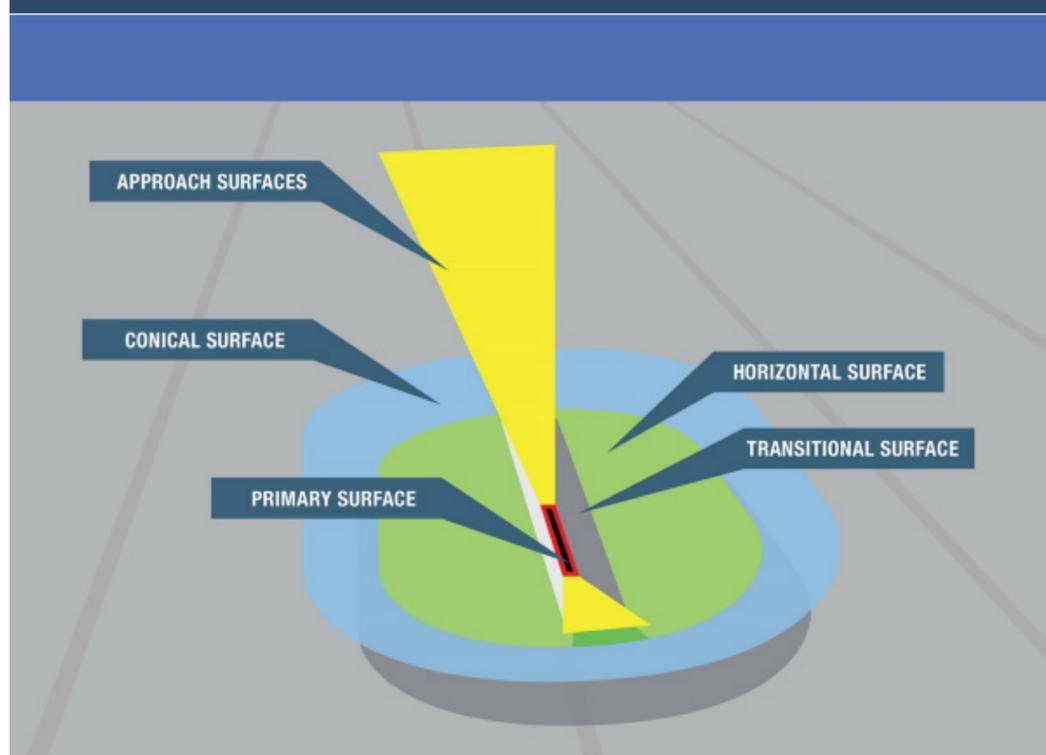
The type of fuel an airport supplies and the capacity of its fuel facilities are dependent on the aircraft utilizing and projected to operate at the airport in the future. A standard recommendation for fueling facilities at a GA airport with some corporate jet activity is at least one 10,000-gallon tank of both Jet-A and 100 Low-Lead (LL), also referred to as AvGas. If there are high levels of operational activity, additional tanks may be necessary. Depending on the airport, the FBO may be tasked with providing fuel. If this is the case, airport management may dictate specific requirements or allow the FBO to determine fueling needs. Airport management should ensure user needs are being met.

It is also important to examine the location of the fuel facilities to ensure delivery trucks can access the tanks and aircraft can access the pumps. NFPA 407, *Standard for Aircraft Fuel Services and FAA AC 150/5230-4B, Aircraft Fuel Storage, Handling, Training, and Dispensing on Airports* provide Federal regulations on aircraft fueling. *ACRP Report 113, Guidebook on General Aviation Facility Planning* and *ACRP Synthesis 63, Overview of Airport Fueling System Operations* also provide additional information on location and typical layouts of fueling facilities.

Other considerations for fueling needs include self-service fueling, which allows for 24-hour a day fueling capabilities via a credit card system and changing fuel requirements based on the removal of lead and possibly new fuel types such as biofuels or automobile fuels (MoGas).

The EPA highly recommends Spill Response Plans or Spill Prevention Control and Countermeasure (SPCC) plans and training for GA airports to prevent fuel and oil from reaching waters under the Clean Water Act. Information regarding SPCC plans can be found in FAA **Order 1050.4C**.

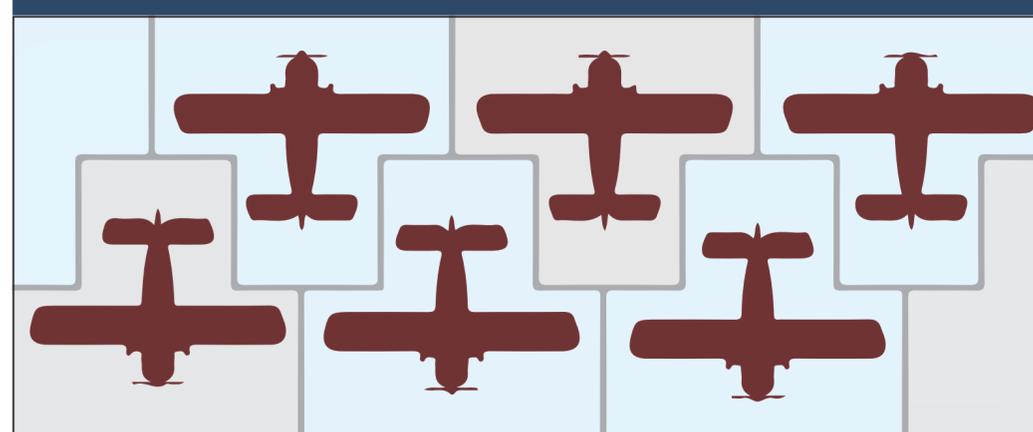
**FIGURE 21. THREE-DIMENSIONAL PART 77 SURFACES**



**General Aviation Facility Planning**

As landside guidance and regulations can vary widely between commercial and GA airports, it is best to examine the need for landside facilities as two separate components. In many cases, GA activity is located in a separate area from commercial activity at the same airport to reduce confusion for passengers, ensure adherence to TSA safety

**FIGURE 22. NESTED T-HANGAR DESIGN**



## Ground Access, Circulation, and Parking

It is important to consider ground access at all airports and how to best coordinate airport access into local and regional transportation planning. As airports are also utilized for special events and emergency response, adequate and efficient access is necessary.

Roadways are also necessary to ensure users can reach all applicable locations on the airfield without entering airfield movement areas. Special care should be taken to avoid routing proposed roads through runway protection zones. Automobile parking should also be provided near hangar areas and terminal facilities based on customer needs and activity levels. While an airport may review the total number of automobile parking spaces available on the airport compared to the peak daily operations, automobile parking should be available at all aircraft storage and business locations. If roadways and parking are not available nearby for users, there is an increased chance of vehicles and pedestrians in undesirable locations. Local guidance or regulations such as spaces per square foot of building space, size of spaces, or number of handicapped spaces should be reviewed for parking guidelines.

TRB's *ACRP Report 113, Guidebook on General Aviation Facility Planning* provides additional information on recommended number of parking spaces by facility type and typical layouts.

## Perimeter Fencing

Perimeter fences enhance safety for pilots and passengers by limiting pedestrian and vehicle access to the runway through a clear boundary. A perimeter fence can also help reduce wildlife on the airfield. Federal and FDOT funding is becoming increasingly available for perimeter fences. The Master Plan may evaluate specific locations, height of the fence, and the need for additional features such as skirts or barbed wire. These features are based on the fence's primary purpose (e.g., deterring wildlife or security). If the fence is for deterring wildlife, the type of wildlife will affect the features needed. Sponsors should be aware that fences proposed for the purpose of discouraging wildlife must be justified by a wildlife hazard management or hazard site visit report in order to be eligible for federal funding. The fence's location can be dictated by safety areas, object free areas, utilities, topography, or environmental conditions.

## Airport Rescue and Fire Fighting (ARFF) Facilities

While only airports with a Part 139 certificate are required to have ARFF facilities; all airports should address the need for rescue and firefighting including how to appropriately handle aircraft accidents. This may include discussions with local emergency service providers on their ability to handle aircraft rescues and knowledge of airport operations such as tower frequencies and location of access gates. More information on ARFF planning can be found on page 47.

## Security

The U.S. aviation security system involves the government, airports, and aircraft operators, each of which is regulated by numerous agencies. The TSA is the main source of regulation and guidance for security of airports as of 2001 through the Title 49 CFR Part 1500 series, the *Transportation Security Regulations*. Airports are required to follow numerous regulations depending on the role and services provided.

49 CFR Part 1554 requires each FAA certificated repair station comply with security measures issued by TSA if they are located on or adjacent to an airport or service aircraft greater than 12,500 pounds maximum take-off weight (MTOW).

For GA airports, TSA developed the *Security Guidelines for General Aviation Airports* (July 2017) that contains guidance on which enhancements are most appropriate based on an Airport Characteristics Measurement Tool. Airports closer to major cities or with

multiple larger aircraft have more robust recommendations than an airport with a turf runway and very few and small aircraft. FDOT expanded on this document with the Security Planning for General Aviation Airports and asked airports to develop, at minimum, a rudimentary security plan if they did not already have one in place. *ACRP Synthesis 3, General Aviation Safety and Security Practices* examines resources and strategies used within the GA community.

## Commercial Airport Facility Planning

Commercial service airports are subject to additional regulations and have additional landside needs that must be addressed due to larger-scale passenger activities. For planning purposes, the commercial service passenger terminal area is typically divided into landside (access to terminal), terminal (the terminal facility), and airside (access to the aircraft). Some airports define the landside terminal area as all areas prior to the security checkpoint and airside terminal area after the security checkpoint. Passenger terminal facilities are typically planned for and designed outside of the master planning process due to each airport's unique role within the transportation system. The Master Plan should review the basic capacity needs of the commercial service terminal. FAA provides commercial terminal planning guidance in *FAA AC 150/5360-13A, Airport Terminal Planning*. ACRP guidance is also available in *Report 25 Airport Passenger Terminal Planning and Design*, Volumes 1 and 2, and other ACRP reports described on the following pages.

## Airside Facilities

As the efficiency of airfield operations can affect the efficiency of the passenger terminal, the planning and layout of the gates, aircraft parking, ground vehicle lanes, and taxiway system are extremely important at commercial service airports. Costly damage occurs each year between aircraft and buildings or equipment due to poor design of airside terminal facilities, lack of training, and failure to pay attention. The Master Plan should review:

- **Aircraft apron parking (daily and overnight)**
  - Locations to park aircraft on apron areas at the terminal or remote locations during the day between flights and requirements for overnight parking
- **Quantity and type of gates**
  - Number, type, and spacing of the gates to accommodate the commercial airline fleet mix
- **Ground service equipment**
  - Staging, storing, and moving vehicles and equipment such as tugs, baggage carts, and fuel trucks should be addressed to ensure adequate separation and safety for users and pilots
- **Aircraft servicing areas**
  - Activities occurring while passengers are enplaning and deplaning may include fueling, lavatory servicing, baggage handling, catering, ground power, and maintenance
- **Emergency response and security**

## Florida Specific Information!

Section 330.30(2)(f), F.S. states that airports with at least one runway greater than 4,999 feet and that do not host commercial service operations (under CFR Part 139), must have a security plan on file with FDOT. Airports shall update their plan at least once every two years. No renewal license shall be issued unless the Department approves the updated security plan.



- Providing adequate access for emergency response times and ensuring all required security measures are followed

The location of these facilities should be reviewed to ensure they do not become obstructions to the Part 77 Surfaces or are placed within safety areas.

TRB's **ACRP Report 96, Apron Planning and Design Guidebook** provides additional information on apron planning at commercial airports.

## Passenger Terminal Facilities

The Master Plan may review the space requirements and elements necessary in the terminal such as:

- Ticket counters (including consideration of kiosks and whether there are common use technologies)
- Security checkpoints
- Departure and arrival seating and waiting areas
- Concessions
- Vendor office space (including airlines and other vendors)
- Baggage handling (including bag makeup and claim)
- Restrooms
- Federal Inspection Services (FIS) such as customs and immigration
- Concessions
- Wayfinding
- Mechanical space for elevators and other electrical needs
- Other services such as Wi-Fi, people movers, and electrical charging areas

While a full terminal plan could be part of a Master Plan or a separate study, the terminal analysis comprises a detailed review of each functional component including the circulation of passengers within the terminal facility. New technologies for terminal planning and integrating these technologies into the building should be reviewed and considered.

## Landside Facilities (Ground Transportation)

Ground transportation is an important element of the Master Plan; however, for commercial airports with large terminal facilities, the terminal planning study should assess this topic in detail. As with GA airports, commercial service airports should be integrated within the regional transportation planning efforts to ensure adequate access is provided for all modes of transportation. While the FAA will typically only fund projects within the airport boundary, the regional plans need to address ground access to and from the airport for vehicles and other modes of public transportation such as buses or rail.

Items to be discussed in landside terminal facility planning may include:

- **Curbfront**
  - Curbfront facility needs are determined by examining vehicle volumes, vehicle classification (automobile, taxi, etc.), and dwell times. Needs are also identified by determining the appropriate configuration of the terminal entry for the airport (single level, two level, double level, inner and outer curbs).
- **Public transportation**
  - Public transportation to the airport can increase convenience for originating and departing passengers, decrease traffic congestion, and improve sustainability. **ACRP Report 4, Ground Access to Major Airports by Public Transportation** provides a six-step market-based strategy for improving

the quality of public mode services. Under Grant Assurance 36, the airport sponsor is required to permit to the maximum extent practicable, intercity buses or other modes of transportation to have access to the airport.

- **Delivery trucks for concessionaires and air cargo facilities**

- Planning should ensure adequate roadway infrastructure (e.g., lane widths, pavement strength, loading and unloading areas) is provided to the appropriate locations on the airport. The feasibility of constructing a consolidated receiving facility should be considered.

- **Employee and tenant parking**

- As airports may be staffed all day, ample and convenient employee and tenant parking must be available. Implementing commuting incentives can reduce the number of vehicles parked onsite by increasing the use of public transportation and thus contributing to sustainability.

- **Cell phone waiting lots**

- These lots allow drivers to wait near the arriving passenger pickup area without adding to curbside congestion.

- **Staging areas for taxis, rideshare vehicles, limos, charter buses, and courtesy vans**

- An airport may need areas where these vehicles can be staged on- or off-airport and dispatched as needed to pick up passengers at the terminal curbside. Dedicated curbsides can be made for these providers at the terminal for the convenience of passengers. Charter buses may need passenger staging areas within the terminal as they may require passengers to check-in and wait for their bus.

- **Ride sharing**

- Companies such as Uber and Lyft are working with airports across the country to ensure they adhere to local requirements and operate legally. Agreements with these companies should be addressed so no unfair advantage is given to a single airport provider and the airport is not losing potential revenue. The need for, and location of, designated pick-up and drop-off points for ride sharing should be considered.

- **Rental car facilities**

- Facilities may range in size depending on airport activity levels and may include a consolidated rental car operation within the airport. The airport should compare existing capacity of operators to peak passenger operations to ensure adequate supply. The impact of other rental car facilities activities such as washing, fueling, and maintenance on the vehicles should also be analyzed.

- **Signage**

- Adequate signage at an airport can reduce congestion and increase passenger satisfaction. *FAA AC 150/5360-12F, Airport Signing and Graphics* provides guidance on wayfinding, signing, and graphics focusing on roadways, parking, curbside and ground transportation, and terminal. The latest version incorporates recommendations from the TRB's ACRP Report 52, *Wayfinding and Signing Guidelines for Airport Terminals and Landside*.

Numerous TRB resources are available for commercial airport landside planning including:

- *ACRP Report 10, Innovations for Airport Terminal Facilities*
- *ACRP Report 25, Airport Passenger Terminal Planning and Design, Volume 1: Guidebook and Volume 2: Spreadsheet Models and User's Guide*
- *ACRP Report 40, Airport Curbside and Terminal Area Roadway Operations*
- *ACRP Report 55, Passenger Level of Service and Spatial Planning for Airport Terminals*
- *ACRP Report 109, Improving Terminal Design to Increase Revenue Generation Related to Customer Satisfaction*
- *ACRP Report 146, Commercial Ground Transportation at Airports: Best Practices*
- *ACRP Report 146, Commercial Ground Transportation at Airports: Best Practices*

### **Airport Rescue and Fire Fighting Facilities (ARFF)**

Only airports with a Part 139 certificate are required to have ARFF facilities; however, all airports should address the need for rescue and firefighting, including how to appropriately handle aircraft accidents. Part 139 airports are assigned an ARFF index that ranges from Index A to E and is based on the length of the airline's aircraft and the average number of daily departures by the airline. Aviation forecasts should be reviewed to determine the ARFF index and any changes needed during the planning period. The index, located in 14 CFR Part 139, Certification of Airports (sections 139.315 to 139.319), also determines the specific equipment requirements. *FAA AC 150/5210-15A, Airport Rescue and Firefighting Station Building Design* contains information for the design of the ARFF station.

### **Security**

As discussed in the GA security section, the TSA is the main source of regulation and guidance for security of airports as of 2001 through the Title 49 CFR Part 1500 series, the Transportation Security Regulations. Airports are required to follow numerous regulations depending on the role and services provided.

*49 CFR Part 1542, Airport Security* lists the regulations governing commercial service airports in the U.S. such use of security areas, identification systems, security coordinators, inspections, training, and drafting an Airport Security Program (ASP). While commercial airports will most likely have higher security measures in place already, they should ensure any GA and charter activity at the airport adheres to the 49 CFR Part 1554 repair station requirements, TSA LASP, the TFSSP, the PCSSP, and FAC Rule 14-60.007 as discussed above.

### **Other Potential Topics**

There are additional topics that may need to be addressed on a case-by-case basis for some airports; the FAA Advisory Circulars and Airport Cooperative Research Program (ACRP) provides information on such topics. Examples of topics are provided below. More detail on these topics is provided in **Appendix 7**.

### **Air Traffic Control Tower (ATCT)**

Prior to new airfield development, airports should review the line-of-sight from the tower to ensure controllers can adequately view all movement areas and potentially determine any currently obscured areas. This analysis can be completed using 3-D technology.

### **Air Cargo**

Air cargo can range from fresh flowers to appliances and in size from small local deliveries to large global carriers. Reviewing operations and facilities on-airport and in surrounding areas ensures necessities are being met and growth opportunities are considered.

### **Maintenance and Rehabilitation of Facilities**

Facilities such as hangars, support buildings, roads, fences, parking lots, must be maintained and periodically rehabilitated to ensure their full lifespan.

### **Surplus Property**

In certain cases, the master planning process may determine that there is a surplus of land within the airport boundary that may have more valuable, non-aviation use. Per Grant Assurance 31, no airport sponsor may sell or dispose of acquired property without FAA approval.

### **Utilities**

The existing and future needs for utilities such as electricity, communications, water, sewer, Internet, and drainage should be evaluated within the airport boundary and adjacent property.

### **Space Travel**

Given Florida's history of space travel with the Kennedy Space Center at Cape Canaveral and new prospects for commercial space travel within the U.S., planning for facilities supporting horizontal- and/or vertical launches should be considered.

### **Americans with Disabilities Act (ADA) Compliance**

The FAA provides guidance through Section 504 Airport Disability Compliance Program regarding ADA requirements.

### **Through-the-Fence (TTF) Operations**

Through-the-fence (TTF) operations occur when airport sponsors provide access to airside facilities (e.g., runway) to operators that have facilities adjacent to, but not within, airport property limits.

### **Energy**

To increase sustainability both environmentally and economically, more airports are reviewing their energy uses.

### **Cyber Security**

As society moves to a more digital infrastructure, more airport systems are vulnerable to a cyber-attack.

### **Safety Management System (SMS)**

SMS is the formal approach to managing safety risks and comprises safety policy, safety risk management, safety assurance, and safety promotion.

### **Snow Removal Equipment and Deicing**

If appropriate for a specific airport based on weather patterns or user needs, snow removal containment and storage facilities need to be reviewed.

### **Documentation**

A summary of the facility requirements, typically a table or bullet point list, will assist in quickly clarifying the needs of the airport. Planners can utilize this list to determine potential development scenarios in the Alternatives Development. It can also serve as a validation of the recommended development plan to ensure all topics.

The alternatives development process of the Master Plan resolves the deficiencies and builds on the opportunities identified in the Facility Requirements chapter. As there is typically more than one solution available, the alternatives must be evaluated to arrive at the most appropriate recommendation. The Facility Requirements chapter of this Guidebook provides information and reference materials on the physical development requirements to meet future demand and standards; this chapter focuses on developing and analyzing the alternatives. The ultimate goal of analyzing alternatives is to identify and evaluate all of the alternatives that are designed to meet the current and future needs of all airport users as well as keeping within the strategic vision of the airport sponsor. Based on this process, a final recommended development plan is developed and illustrated in the ALP and estimated costs for the plan are detailed in the CIP.

The alternatives analysis process should follow the tasks outlined in the Master Plan scope which likely referenced specific issues the sponsor recognized as being critical to the plan's overall success. In some cases, additional planning such as researching specific information for an environmental issue like a wetland delineation or conducting a ground survey may be included in the alternatives analysis task or a prior task. This may result in a more accurate evaluation of the alternatives and ultimately lead to a recommended plan that can be implemented successfully. Such additional tasks should be specified in the scope during the planning process or discussed with the FAA and FDOT prior to completion. This is especially critical for environmental approvals that may be necessary prior to development.

This chapter addresses the following aviation alternatives development topics:

1. Analyze Process
2. Identifying Alternatives
3. Evaluating Alternatives
4. Selecting Recommended Alternative

### Analysis Process

FAA AC 150/5070-6B, *Airport Master Plans* defines the process for identifying and analyzing the alternatives (Figure 23). The alternatives analysis is considered iterative and is often initiated during the development of the Facility Requirements as deficiencies are identified and potential resolutions are discussed. The process can be adapted as necessary for the airport size, specific components, and complexity of the plan. The process should be defined during the scoping effort to include the elements to be analyzed, types and depth of analysis, and level of documentation to ensure all stakeholders reach consensus that the alternatives are evaluated appropriately. Only elements relevant to the airport's deficiencies as identified within the Facility Requirements should be addressed in the alternatives analysis. Additionally, certain topics may be discussed further in depth or have a higher number of potential alternatives available for consideration based on the airport and element. Elements that have been controversial to the public should be documented in detail to ensure full transparency and include public input into the decision-making process to select the preferred or recommended alternative.

The following steps are shown in Figure 23 and outline the process for identifying, analyzing, and recommending alternatives, as prescribed in FAA AC 150/5070-6B, *Airport Master Plans*. This list is exhaustive, and, as such, all identified steps may not be needed for every Master Plan, depending on the needs of the airport.

### Step 1 – Determine Primary And Secondary Elements

Determine which functional elements (e.g., airside, terminal, GA, cargo, etc.) are the highest priority and which are secondary and can be modified based on the recommended development plans for the primary elements.

### Step 2 – Identify Preliminary Primary Element Alternatives

Identify preliminary alternatives for each primary element. This may be accomplished through a brainstorming session.

### Steps 3 & 4 – Screen Alternatives For Intermediate List Of Primary Element Alternatives

Using subjective and qualitative analysis, narrow down the preliminary list of alternatives using a screening process. Provide justification for any eliminated or newly identified alternatives. This list is referred to as the "Intermediate List." More details on the evaluation process are provided later in this chapter. Eliminated alternatives need to be mentioned only briefly in the Master Plan; however, this information may be important to subsequent environmental documentation.

### Steps 5 & 6 – Quantitative Analysis For Short List Of Primary Element Alternatives

Perform a more detailed quantitative analysis on the "Intermediate List" to reduce it to a "Short List." The Master Plan should include a detailed analysis of the "Short List" of alternatives. More details on the evaluation process are provided later in this chapter.

### Steps 7 & 8 – Combine And Analyze Primary Element Alternatives

Review the "Short List" of all primary elements and perform a quantitative analysis of the projects to ensure compatibility.

### Step 9 – Select Preferred Primary Element Alternative

Select and document the preferred or recommended alternative for each primary element based on previous analysis.

### Step 10 – Identify Alternatives For The Secondary Elements

Select preliminary alternatives for each secondary element.

### Steps 11 & 12 – Evaluate And Select Recommended Alternatives For Secondary Elements

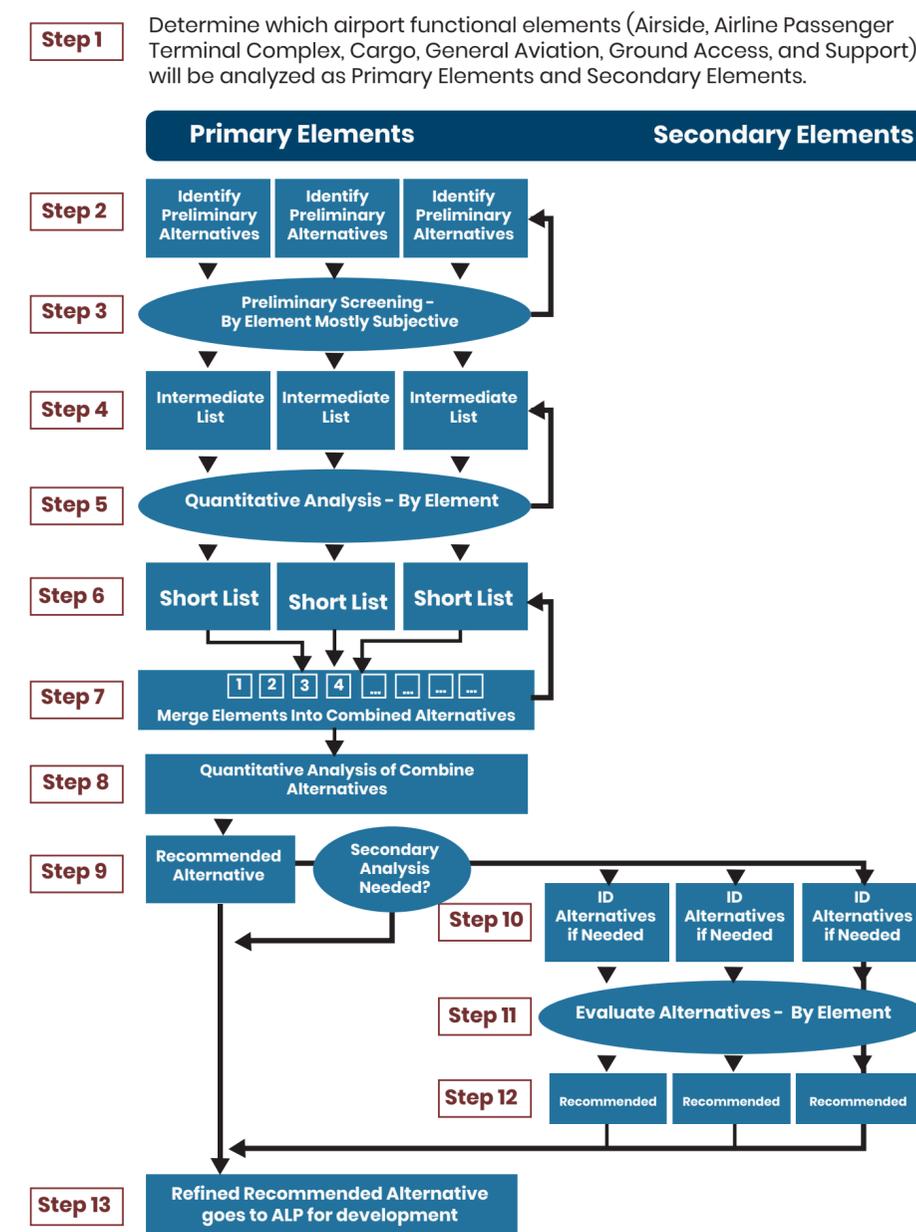
Perform qualitative and quantitative analysis on all alternatives individually and as a whole. Document any alternatives that are eliminated and provide justification for those that are recommended.

### Step 13 – Prepare Refined Recommended Alternative

Combine and analyze the primary and secondary element alternatives to present a single recommended development plan for the airport. Summarize final justification of the recommended plan.

These 13 steps are shown graphically in Figure 23.

FIGURE 23. ALTERNATIVES ANALYSIS PROCESS EXAMPLE



Source: FAA AC 150/5070 6B, *Airport Master Plans*

### Identifying Alternatives

A primary consideration in identifying alternatives is ensuring that they are aligned with the airport's goals, including serving demand and meeting design standards. When identifying alternatives, it is prudent to only consider those that address facility requirements and can be implemented.

Planners should, at a minimum, review each alternative's financial feasibility, aviation use, and technical feasibility.

A recommended number of alternatives cannot be defined numerically as there are too many factors that can influence the number of alternatives that should be evaluated. Instead, the number of alternatives should be kept to a sensible amount to ensure there are no alternatives that have the same basic concept with only minor differences that would be configured during the design phase of a project. An alternative may be later refined during the master planning process. The preliminary list may be compiled and then reduced to a short list. Documentation including the justification for recommending or eliminating each alternative should be provided in the Master Plan; this is especially critical for any environmentally sensitive areas where an alternative avoids the area or requires a high level of mitigation to implement.

This documentation may help justify why an alternative should not be used in an environmental analysis such as an EA. It should be noted that a “do-nothing” alternative may be applicable in some instances, even if only to highlight the potential impact to the airport if no action is taken; for example, a lack of Federal funding for other projects if the non-standard RSA is not addressed or the need to reduce the runway length because tree obstructions cannot be removed in a wetland area.

Multiple or extensive alternatives may not be necessary for secondary elements as these elements may be able to seamlessly integrate into the primary element recommendations. This should be analyzed on a case-by-case basis.

Characters of appropriate alternatives include:

- Have a base case (existing condition) to compare
- Address the deficiency and add value to the airport
- Are based on technical knowledge and research
- Able to be compared by the criteria
- Have input or review from multiple stakeholders
- Are clearly defined

Alternatives may be identified through collaborative work sessions within the technical team or with stakeholders. Depending on the framework of the brainstorming session, it may yield an abundance of alternatives. Team members with technical knowledge should be on hand to ensure suggested alternatives are feasible. The reference documents discussed in the Facility Requirements chapter provide numerous alternatives and details for the sizing, layout, and location of various elements.

**Evaluating Alternatives**

As with all steps of developing alternatives, the evaluation must be tailored to the airport to ensure the individual airport’s goals are met while still following generally accepted planning practices. The initial evaluation of the alternatives will most likely be subjective and qualitative utilizing simpler calculations and good judgment.

A set list of selection criteria or influencing factors should be identified to help evaluate and select the recommended plan. These criteria should align with the overall airport goals. There are four broad categories of criteria identified by the FAA:

- **Operational Performance:**
  - An airport’s functionality as a system including capacity, capability, and efficiency
- **Best Planning Tenets and Other Factors**
  - The relative pros and cons or attributes and constraints of the alternative such as safety, design standards, and flexibility
- **Environmental Factors**
  - Potential environmental impacts of each alternative
- **Fiscal Factors**
  - Rough cost estimates, preliminary financial feasibility, return on investment (ROI) analysis, or benefit/cost analysis (BCA) of the alternatives

These broad categories serve as options that the airport can consider. Typically, specific criteria within these categories that align with the airport’s alternatives and issues are established. Several examples of such specific criteria include:

- **Safety**
  - Improving the airfield while meeting Federal, state, and local standards, recommendations, priorities, and grant assurances
- **Consistency**
  - Confirming development plan is in line with overall airport goals, activity forecasts, or compatible land use
- **Economics**
  - Reasonableness of cost and ability to fund
- **Flexibility**
  - Meeting short-term needs while remaining flexible for the long-term
- **Engineering:**
  - Considering constraints and feasibility of the design and construction of the project
- **Public**
  - Input and agreement from the public and other stakeholders
- **Access**
  - Ensuring the development is accessible to users
- **Airspace**
  - Does not impact or improves the airspace surfaces
- **Sustainable**
  - Project aligns with sustainability goals

The evaluation criteria should be discussed early in the process and should consider criteria that help differentiate between alternatives. Criteria are usually explained in the documentation and the evaluation scoring results are summarized and clearly presented in a matrix. The “scoring” of the criteria is not dictated by the FAA or FDOT and the most appropriate method should be developed and selected by the airport. The scoring may be a numerical scale such as from 1 to 10; a yes/no response; a grading system of low, moderate, and high impacts; or any other method that is applicable to the subject element. Specific criteria may be given weights to highlight the priority of individual criteria. The alternatives may also be ranked within the matrix for clarity.

The “scoring” of the criteria is not dictated by the FAA or FDOT and the most appropriate method should be selected by the airport.

An example matrix is shown in **Table 21**.

TABLE 21. PRIMARY ELEMENT TOPICS				
Criteria	Alternative A	Alternative B	Alternative C	Alternative D
Criteria 1	Yes	Yes	Yes	No
Criteria 2	Low	High	Low	Moderate
Criteria 3	5	9	2	8
Rank	2	1	4	3

Source: Kimley-Horn and Associates, INC., 2016



Although airport planning is geared towards enhancing the existing airport, it is not always feasible to develop the airport to handle forecasted demand. In cases such as this, a new airport site may be identified as an alternative. FAA AC 150/5070-6B, *Airport Master Plans*, Appendix E provides additional guidance on this process. FAA approval on the new location is required if federal funding will be requested.

### Selecting Recommended Alternative

A summary of the alternatives analysis along with any justifying documentation should be presented to the stakeholders for input before selecting the final recommended alternative for both primary and secondary elements. This is critical to ensuring study participants, including the public, can understand the process employed to identify and evaluate the alternatives and how the recommended alternatives were selected. The level of complexity in determining the recommended plan and compiling the alternatives into a recommended plan will be based on the individual airport.

Depending on the airport and number of elements evaluated in the alternatives analysis, the recommended alternative may require combining various elements into a single recommended plan. For example, if there are separate airfield, terminal, and GA alternatives evaluated in the process, the preferred alternative for each of these components must be combined to represent the recommended plan. This process may require additional refinement once the projects are selected and the preferred alternatives are considered in totality. At this stage of the Master Plan, comments from airport stakeholders on the proposed recommended plan should be solicited as part of the public involvement requirement.

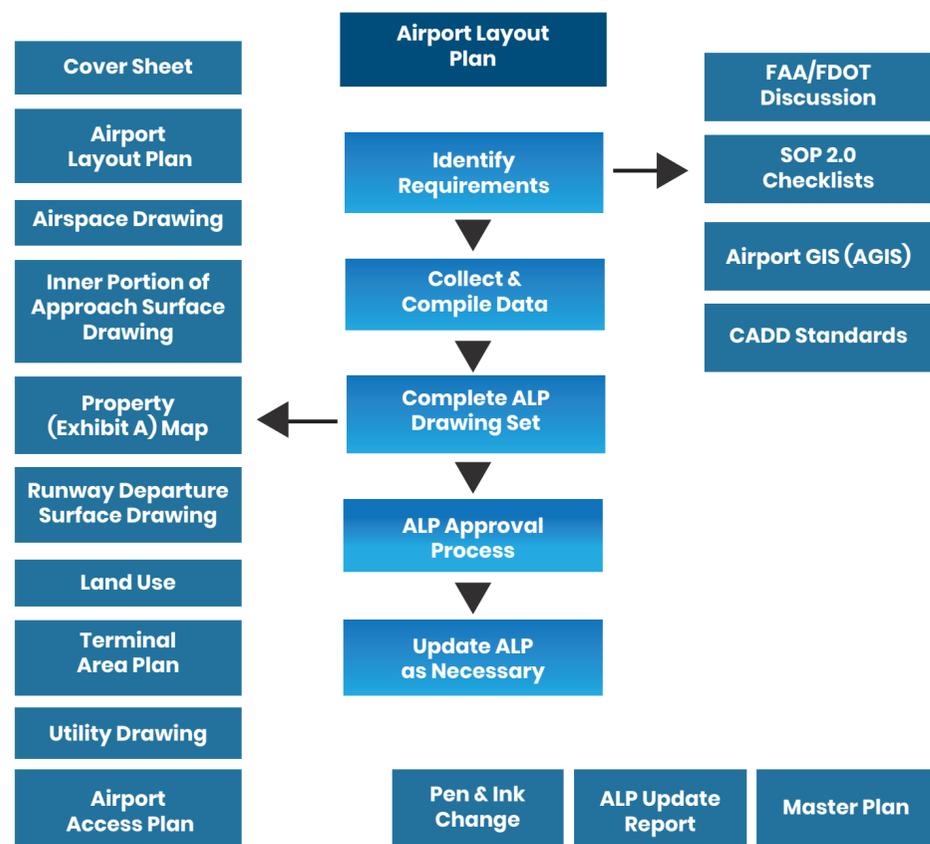
Once the final recommended plan is determined, it is illustrated in the ALP as discussed in the ALP section. Concurrent with the ALP effort, the Facilities Implementation Plan expands on information of the individual projects in the recommended plan to evaluate interdependencies and requirements. This effort results in the CIP, which presents cost estimates and phasing. The Financial Feasibility Analysis then compares the proposed CIP to the sponsor's projected cash flow and availability of outside funding sources to ensure the projects can be funded and provide value to the airport.

### Documentation

Once the final recommended plan is determined, it is illustrated in the ALP as discussed in the ALP section. Concurrent with the ALP effort, the Facilities Implementation Plan expands on information of the individual projects in the recommended plan to evaluate interdependencies and requirements. This effort results in the CIP, which presents cost estimates and phasing. The Financial Feasibility Analysis then compares the proposed CIP to the sponsor's projected cash flow and availability of outside funding sources to ensure the projects can be funded and provide value to the airport.

The ALP is the guiding development document for an airport and is usually approved by the airport sponsor, FDOT ASO, and the FAA. The ALP is developed based on either a Master Plan's analysis of needs determined by reviewing the forecasts, facility requirements, and alternatives evaluation, or through other evaluations that support the ALP's depiction of future development. An ALP is also referred to as an ALP drawing set and graphically illustrates the existing airport infrastructure and proposed projects in a series of sheets or drawings. The ALP serves as a "communication" and "agreement" tool between the airport owner and the FAA. Coordination between the FAA and sponsor during the scoping process will determine which elements are to be included in the ALP drawing set. The ALP drawing set is considered a set of planning drawings and is not intended to be used for design engineering.

**FIGURE 24. AIRPORT LAYOUT PLAN PROCESS**



Source: Kimley-Horn and Associates, INC., 2016

As shown in **Figure 24**, this chapter provides details on identifying the ALP requirements, preparing the individual sheets that comprise the drawings set, and obtaining approval. This chapter also provides details on developing ALPs without a full-scale Master Plan.

### Computer-Aided Drafting and Design (CADD) Standards

While GIS-based data collection is recommended for new ALPs, airports may still create them using CADD software such as AutoCAD or MicroStation. Specific industry design

standards reduce the potential for drawings to be misread and allow different agencies to utilize them to suit their specific needs. FDOT provides a **CADD Manual** to facilitate this process.

### Airport GIS (AGIS)

To support NextGen, the FAA now recommends airports utilize GIS when developing and maintaining ALPs. The information contained in the ALP sets is more accurate as a result of utilizing aeronautical surveys. In the future, the FAA will likely require electronic submissions through AGIS to further improve accuracy and information sharing. Other benefits of developing an ALP using AGIS that airports may experience include better asset management capabilities, improved operations and maintenance management, and streamlined future data collection.

Additionally, when a project is considered to be Safety-Critical at a NPIAS airport, the airport is required to incorporate AGIS immediately per the 2012 AGIS Transition Policy for Non-Safety Critical Data Memo. Master Plans or ALP updates that include aerial photography or obstruction surveys must be in conformance with the current version of *FAA AC 150/5300-17* and *18*. If AGIS data is collected as part of the Master Plan or ALP study, the airport will have the data necessary to begin designing the project.

Safety-Critical Projects (**Table 22**) include projects relating to runway thresholds, changes in runway dimensions, modification of declared distances, changes to instrument approaches and NAVAIDs, changes to airport elevation or reference point, and airport needing Surface Movement Guidance and Control System (SMGCS) charts.

Airport-related data must be collected and submitted to the FAA to support satellite-based approach procedures and better manage the overall National Airspace System (NAS).

**TABLE 22. SAFETY CRITICAL PROJECTS – ACTIVITIES THAT MUST IMMEDIATELY COMPLY AT ALL AIRPORTS**

Relocate/ move a runway or threshold	If the runway end is relocated, moved, or discovered to be more than one foot longitudinal, one foot transverse, or 6 inches vertical from its existing position
Displace Threshold	
Extend/ shorten/ shift runway	
Widen/ runway	
New/ revised instrument approach	
Install/ relocate NAVAID (electronic or visual)	
Changes to airport elevation or airport reference point	
Airports currently listed as needing Surface Movement Guidance and Control System (SMGCS) charts	

Source: FAA Memorandum titled *AGIS Transition Policy for Non-Safety Critical Data*, 2012

This information can also be useful for the airport itself by gathering precise locational information. This data can then be tied into the local and regional level systems as appropriate. The FAA's overall guidance and documentation for AGIS can be found at: [www.faa.gov/airports/planning\\_capacity/airports\\_gis\\_electronic\\_alp/](http://www.faa.gov/airports/planning_capacity/airports_gis_electronic_alp/).

The FAA **Airports GIS Program** provides additional information and includes the portal for submitting project data.

#### Specific ACs related to aeronautical surveys include the following:

- *FAA AC 150/5300-16A, General Guidance and Specifications for Aeronautical Surveys: Establishment of Geodetic Control and Submission to the National Geodetic Survey (NGS)* – Explains the specifications for establishing geodetic control and how to submit the information to the NGS/FAA. A draft version of AC 150/5300-16B was issued for comment on July 17, 2018
- *FAA AC 150/5300-17C, Standards for Using Remote Sensing Technologies in Airport Surveys* – Provides guidance on the use of remote sensing technologies in collecting the data.
- *FAA AC 150/5300-18B, Survey and Data Standards for Submission of Aeronautical Data Using Airports GIS* – Provides the specifications and technical requirements for data collection.

Reviewing the required ALP checklists is an important element of the scoping process to determine which drawings and individual components will be required and are recommended.

The first major step in AGIS is to establish the Primary and Secondary Airport Control Station (PACS and SACS). The FAA's guidelines for setting up a project in the AGIS Portal and submitting data can be found at: <https://airports-gis.faa.gov/public/OnlineHelp/contents/pacsandsacs.html>

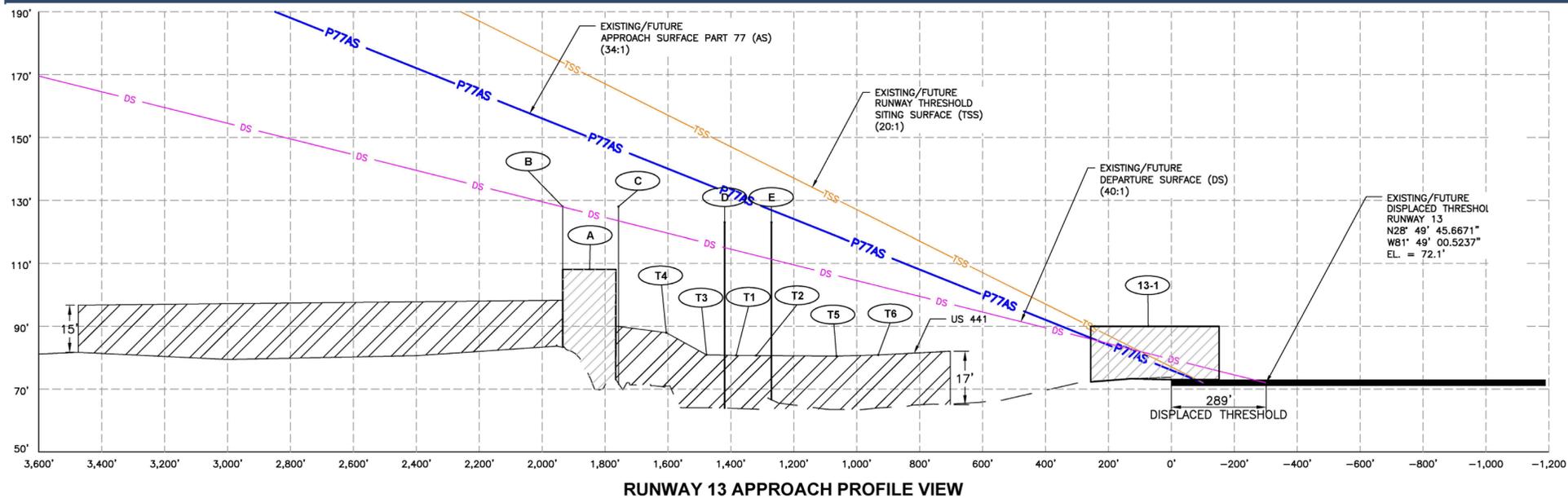
### Narrative Report

A narrative report typically accompanies the ALP set when a full Master Plan is not completed. The narrative report should include a basic aviation forecast, facility requirements, and alternatives analysis as justification for the proposed development to be shown in the ALP. When the ALP set is completed as part of a Master Plan, the review of the above drawings is typically listed in its own chapter or part of the Recommended Development Chapter.

### ALP Drawing Set

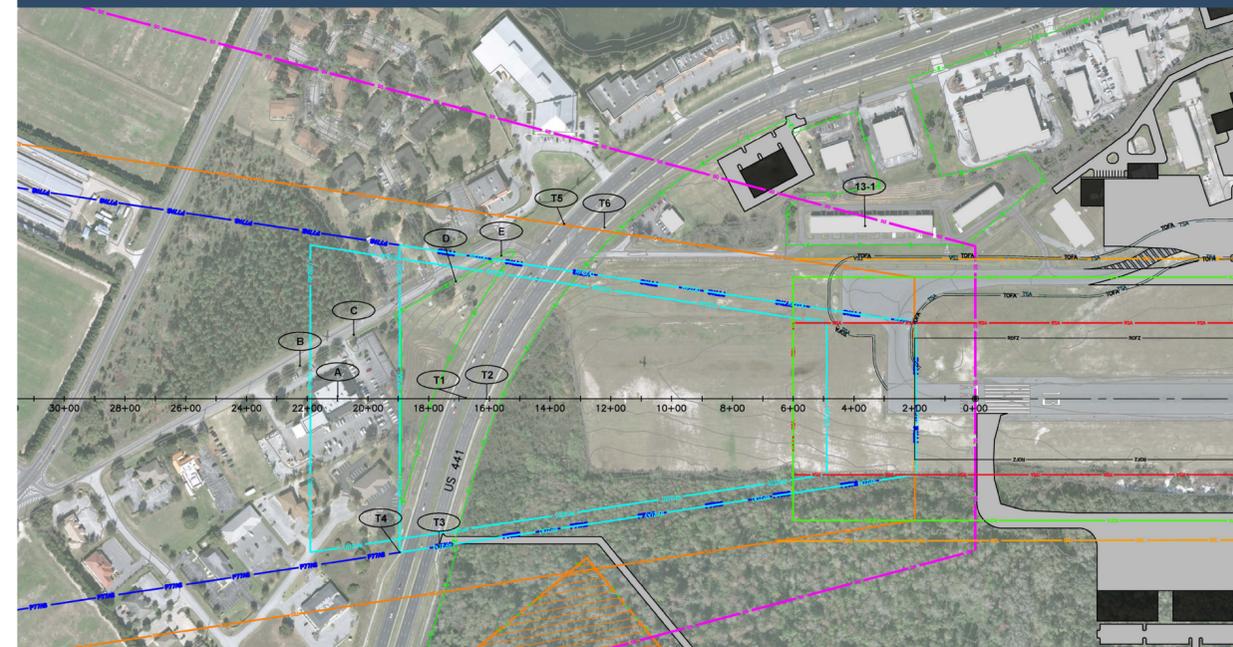
SOP 2.00 Standard Procedure for FAA Review and Approval of Airport Layout Plans (ALPs) provides checklists for reviewing the ALP drawing set including required sheets, size and scale, and required data to be shown. Reviewing the required checklists is an important element of the scoping process to determine which drawings and individual components will be required and are recommended, as well as identify several details of what the drawings will depict. The SOP 2.00 states it should be used in lieu of *FAA AC 150/5070-6B, Airport Master Plans, Appendix F* for the checklist. The sponsor should discuss ALP requirements with the FDOT ASO and FAA ADO and ensure the SOP 2.00 checklist notes which specific elements are to be completed during the scoping process. The FAA understands that there are numerous FAA ACs and Orders that reference ALPs and are not always consistent and has been developing a new AC that will consolidate the information into a single document.

**FIGURE 25. SAMPLE INNER APPROACH SURFACE PROFILE**



Source: Leesburg International Airport Master Plan Update, AVCON, INC.

**FIGURE 26. SAMPLE INNER APPROACH SURFACE PLAN**



Source: Leesburg International Airport Master Plan Update, AVCON, INC.

FAA approval of the ALP drawing is important because the FAA will not provide Federal funding for a development project that is not shown in the ALP. The ALP set typically includes the following drawings or sheets:

- Cover Sheet and Drawing Index
- ALP
- Data Sheet
- Airport Airspace Drawing
- Inner Portion of the Approach Surface Drawings
- Runway Departure Surface Drawings
- Property (Exhibit 'A') Map

Other sheets that may be required include:

- Land Use
- Terminal Area Plan
- Utility Drawing
- Airport Access Plan

The airport sponsor, FDOT ASO, and the FAA typically coordinate to identify other sheets that may need to be included in the ALP drawing set. A general description of each sheet is provided in the following sections.

Developing graphics that are clear and easy to understand, such as those shown in **Figure 25** and **Figure 26**, will assist the FAA and the FDOT when reviewing the ALP, which will ultimately help keep the project on schedule.

**COVER SHEET AND DRAWING INDEX**

The cover sheet provides basic details such as the airport name, sponsor, location, and signature blocks for FDOT and the FAA. There may also be a separate Drawing Index sheet or the index may be included on the cover sheet.

**ALP**

The ALP sheet(s) illustrates existing, future, and ultimate facilities and design standards corresponding with the master planning findings. Future development may be shown by phasing. Ultimate development may include facilities that are beyond the 20-year time horizon of the study. Examples of required data points include: wind rose, Airport Reference Point, ground contours, runway end and other building elevations, runway and taxiway details, and safety areas. Per FDOT procedures, the data tables should be located on a secondary sheet. The ALP sheet is approved by the FAA, FDOT, and airport sponsor.

The “existing” ALP sheet, illustrates the airport in its current state and identifies key FAA design standards and existing airside and landside facilities. It may be helpful to have this sheet separate to help clarify what is existing and what is proposed as depicted in the ALP. When an existing ALP sheet is used it should be listed prior to the ALP sheet.

**DATA SHEET**

To allow for a larger scale and reduce the complexity of the ALP sheet, the standard data tables may be placed on a separate sheet from the existing and future ALP sheets. Standard tables include the runway data, airport data, wind roses and coverage, modifications to standards, building inventory, runway protection zone dimensions, and declared distances, if applicable.

**AIRPORT AIRSPACE DRAWING**

The airspace sheet is required to show the plan view of the Part 77 surfaces in its entirety for the ultimate airfield. Surfaces include horizontal, conical, transitional, primary, and

approach. Obstructions are identified and listed by type, penetration to the surface in feet, and recommended action or disposition of the obstruction.

**INNER PORTION OF THE APPROACH SURFACE DRAWINGS**

The inner approach surface sheets contain the plan and profile views of the inner portion of the approach surface to each runway end along with the penetrations based on the Part 77 analysis, as shown in **Figures 25 and 26**. Penetrations are identified by location along with type, penetration to the approach surface in feet, and recommended action. Other surfaces may be included as applicable such as the threshold siting surface (TSS), glideslope qualification surface (GQS), or U.S. Standards for Instrument Procedures (TERPS). Depending on the information required for illustration, only one runway end may be shown per page due to size constraints.

SOP 2.00 and SOP 3.00 must be reviewed and referenced for the specific ALP review and approval procedures as well as additional preparations guidance.

**RUNWAY DEPARTURE SURFACE DRAWING(S)**

The runway departure surface sheet(s) depicts the applicable departure surfaces for runway end(s) designated for instrument departures per FAA AC 150/5300-13A, Airport Design. Penetrations are identified by location along with type, penetration to the appropriate departure surface in feet, and recommended action. Depending on the information required for illustration, only one runway end may be shown per page. While this drawing may be required where applicable, the depiction of the One Engine Inoperative (OEI) surface is optional and is not currently required.

**EXHIBIT 'A' PROPERTY MAP**

The property map sheet depicts the control and history of the existing airport property and plans for future land acquisition. For airports receiving federal assistance for airport

development projects, having a current property map will help to ensure compliance with FAA Grant Assurance 4, Good Title, which states that airports must “hold good title, satisfactory to the Secretary, for the landing area of the airport.” Exhibit ‘A’ property maps are also tied to FDOT Aviation Program Assurance 2, Good Title, which has similar provisions to FAA Grant Assurance 4. Exhibit ‘A’ maps display when and how the property was acquired, if the information is available (e.g., acquired in 1997 utilizing FAA Airport Improvement Program [AIP] funding), and the type of control—whether it is fee-simple title, easements, or leases; and if there are any restrictions, such as donated for conservancy.

An Exhibit A must be prepared in accordance with FAA AC 150/5100-17, *Land Acquisition and Relocation Assistance for Airport Improvement Program Assisted Projects and the checklist provided in SOP 3.00, FAA Review of Exhibit ‘A’ Airport Property Inventory Maps (www.faa.gov/airports/resources/sops/)*.

The FAA emphasizes the importance of having a current and accurate Exhibit ‘A’ drawing on file prior to issuing a grant, as required in FAA grant agreements. The submission of an Exhibit ‘A’ requires the backup documentation in addition to the sheet.

In the unlikely event an Exhibit ‘A’ is not required for the airport, a property map that does not serve as the legally binding Exhibit ‘A’ may be utilized. This property map may use the SOP 2.00 checklist and has less stringent requirements on depiction of parcels and the data required.

#### LAND USE

The land use sheet may be split into on- and off-airport, as necessary, depending on the level of detail and complexity of information. This sheet depicts the existing and ultimate development areas within the airport property and surrounding community, including zoning information. Noise contours on the drawing allow for a quick view of airport compatibility with the surrounding community. While optional, this sheet is typically encouraged and sometimes required by the FAA and FDOT.

#### TERMINAL AREA PLAN

This sheet(s) provides a large-scale illustration of significant terminal area development, both for commercial and GA terminal areas. The terminal area may include aprons, buildings, hangars, parking lots, and roads that are part of the area accessed by the general public. This drawing is typically not needed at every airport type and is therefore considered optional.

#### UTILITY DRAWING

The utility drawing is an optional sheet depicting the airport’s various utilities. This information may not be shown or included in the ALP. While listed in the SOP and FAA AC 150/5070-6B, *Airport Master Plans*, there is no checklist for this sheet.

#### Florida Specific Information!

Per FDOT Aviation Program Assurances, the sponsor understands and agrees that Department approval of any planning project any planning material developed does not constitute or imply any assurance or commitment on the part of the FDOT to approve any pending or future application for state aviation funding.



#### AIRPORT ACCESS PLAN

The airport access plan is a sheet depicting major routes of the various transportation modes that provide service to the airport. The sheet should show both existing and ultimate infrastructure. While listed in the SOP and FAA AC 150/5070-6B, *Airport Master Plans*, there is no checklist for this sheet and it is considered optional depending on the airport type. However, if a future terminal project is being considered as part of the Master Plan Update, then this sheet should be included as part of the ALP set.

#### OBSTACLE ACTION PLAN (OAP)

As part of the FAA’s mission to maintain and enhance the safety, capacity and efficiency of airports, the FAA requires airports to develop an Obstacle Action Plan (OAP) with a focus on the approach and departure surfaces identified by FAA AC 150/5300-13A, *Airport Design* and FAA Order 8260.3B, *The United States Standard for Terminal Instruments Procedures (TERPS)*. Per the FAA Policy, “Reminder of Responsibilities for FAA Personnel and Airport Sponsors for Protecting Approach and Departure Surfaces,” the OAP can vary in size and complexity based on the airport. However, the OAP must address the sponsor’s action plan to maintain clear surfaces.

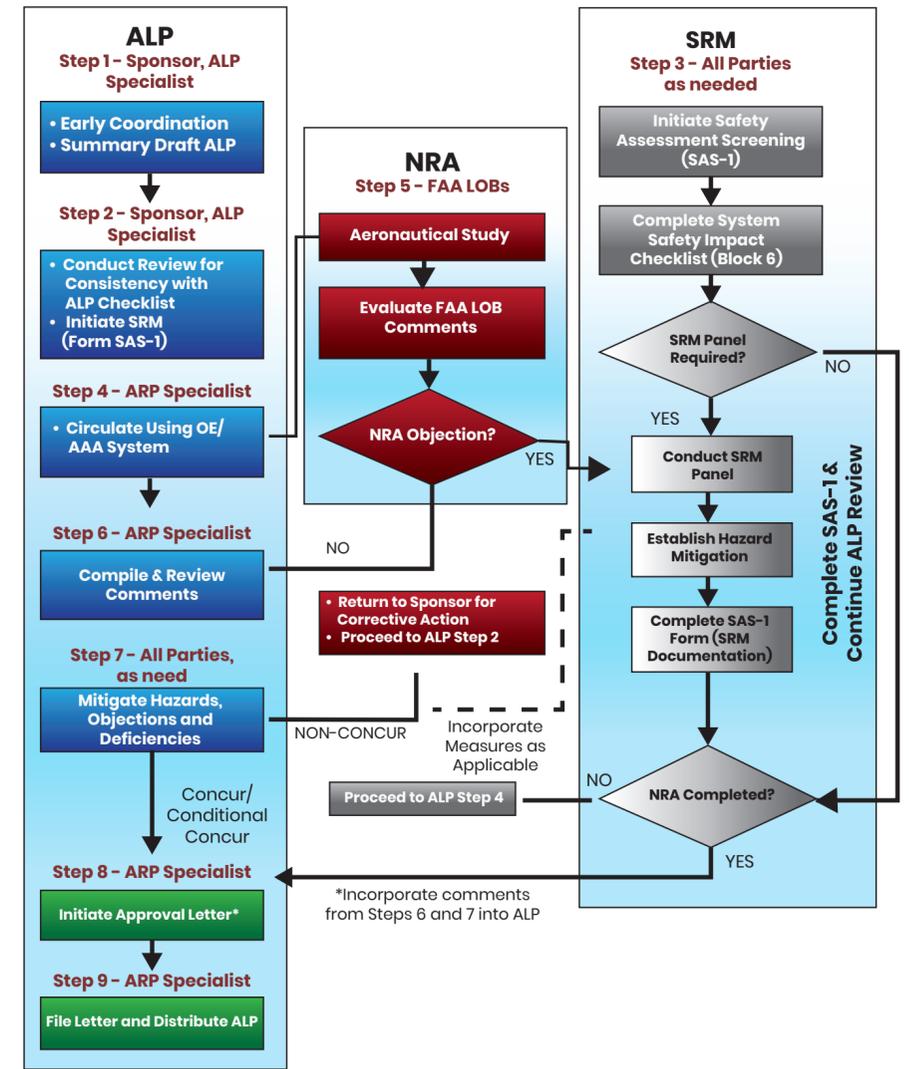
#### ALP Submittal and Approval Process

As illustrated in Figure 27, the ALP will be reviewed and approved through multiple submissions as outlined by the FAA and FDOT during the scoping process. Submittals may include:

- Preliminary ALP Submittal**  
 Possibly submitted only to the sponsor to ensure the ALP includes the proper sheets and projects before submission to the FAA and FDOT
- Draft ALP Submittal**  
 Submitted to the FAA ADO and FDOT for review and comment along with the ALP checklists. The FAA ADO will submit the draft ALP to multiple internal offices as discussed below
- Final ALP Submittal**  
 Revised based on the FAA, FDOT, and any additional airport sponsor comments and submitted to the sponsor, FDOT, and the FAA with the associated documentation (e.g., Narrative Report, Master Plan) for distribution

SOP 2.00 discusses the general process the ALP will follow after submission. After receiving the documents via the OE/AAA system, the FAA provides review. The OE/AAA system allows various offices within the FAA to comment in the ALP, which the ADO will also review. The ADO will communicate the appropriate comments and questions to the airport sponsor. Once the comments are resolved, airport sponsor will sign the ALP and forward the appropriate number of copies to the ADO. The FAA will then issue a conditional approval letter that includes an airspace determination. Once approved, the ALP becomes a governing document for airport development and the sponsor should consider placing security controls on the ALP drawing set to prevent unauthorized changes to the drawings.

FIGURE 27. FAA SUBMITTAL AND REVIEW PROCESS



Source: Adapted from FAA SOP No. 2.00

FAA approval of the ALP is coordinated through FAA SOP 2.00, Standard Procedure for FAA Review and ALPs, which references two FAA Orders that guide approval of ALPs: *FAA Order 5050.4B* which deals with environmental requirements and *FAA JO 7400.2* which deals with airspace matters. FAA SOP 2.00 provides detailed information on the requirements that are provided in both Orders. As stated, there are three types of approvals that an ALP can receive:

- Conditional ALP approval
- Unconditional ALP approval
- “Mixed” ALP approval

Since many projects shown on an ALP have not received formal environmental or airspace approval, the ALP may be approved as “conditional.” Conditional approval is typical for an ALP as it includes long-term plans that are likely beyond the horizon of environmental (three years) and airspace review. Conditional approval also includes noting that development not yet shown in the ALP is subject to FAA environmental and airspace approval as well. The FAA may also provide an unconditional approval, which is unlikely, or a mixed approval, which identifies specific projects that receive unconditional approval.

It should be noted that the FAA and FDOT do not own the airport so it may not dictate what development the ALP shows. The ADO and FDOT provides leadership and guidance through the ALP review and approval process to ensure the FAA’s and FDOT interests are considered, design standards are adhered to, and realistic planning is utilized. The FAA and FDOT may choose to not fund a project shown on the ALP on the basis that the proposal development must be fully justified to eligible for AIP or Passenger Facility Charge (PFC) funding. The airport should obtain an understanding on ineligible projects during the ALP review process and annual ACIP meetings with the FAA and FDOT.

### Updates to the ALP

ALPs may need to be updated periodically to ensure they represent proposed development and reflect the current status of the airport. ALPs become outdated when

they do not provide for future needs, conform to current airport design standards, accurately reflect existing features, or represent critical land use changes that may affect the airport’s navigable airspace or ability to expand.

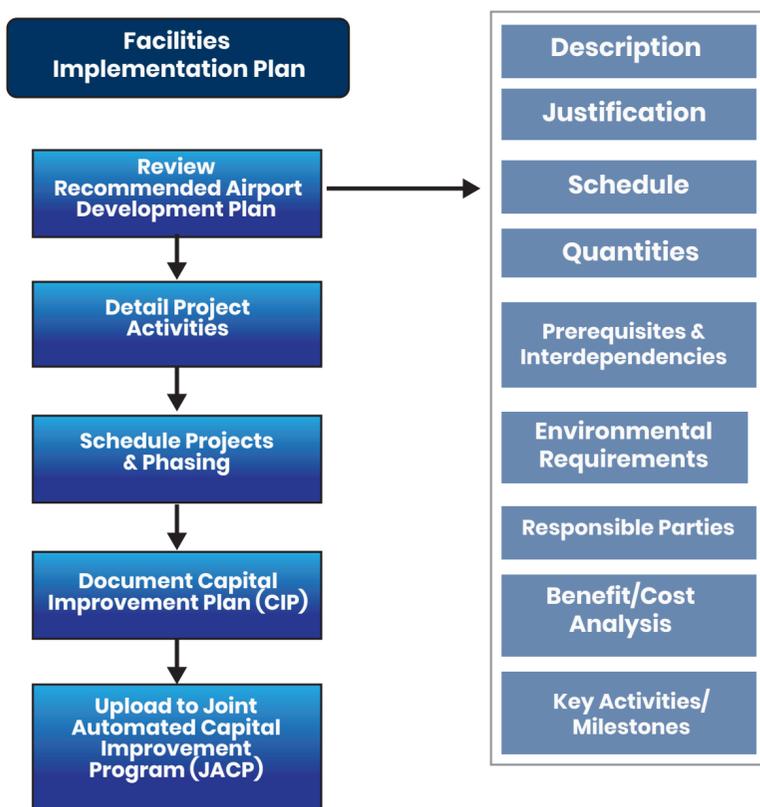
Grouping together ALP changes and making them at once is much more cost-efficient than implementing them individually. Interim changes, referred to as “Pen-and-Ink” changes, are where only the ALP sheet is modified. These changes are typically noted in the Revisions section of the title block. Pen-and-Ink changes should be made as needed or required by the FAA.

ALP updates may be completed with a Narrative Report or as part of a Master Plan Update which is typically completed every five to ten years depending on the airport, its role, complexity and other changes affecting the airport.

SOP 2.00 and SOP 3.00 must be reviewed and referenced for specific ALP review and approval procedures as well as additional preparation guidance



FIGURE 28. FACILITIES IMPLEMENTATION PLAN



Source: Kimley-Horn and Associates, Inc. 2016

A facilities implementation plan translates the recommended development plan, developed in the Alternatives Analysis, into a series of projects that comprise the CIP. FAA AC 150/5070-6, *Airport Master Plan*, Chapter 11 describes the facilities implementation plan as the component that provides guidance on how to implement the findings and recommendations of the planning effort. **Figure 28** shows the key steps in developing a CIP from gathering information on the individual projects to scheduling the projects to sharing the plan with funding sources to secure future funding. The final CIP will be reviewed in a Financial Feasibility Analysis to determine the ability to fund each of the projects in the proposed schedule.

Based on all of the information that is gathered throughout the life of the project, including considerations from the public as part of the stakeholder outreach process, the facilities implementation plan consolidates that information and identifies how and when projects will be completed. The complexity of the plan depends on the size, type, and role of the airport. In some cases, a very simple plan capturing required items may be all that is needed, whereas other situations may call for a more detailed and comprehensive plan information.

The scope of work is the key document that determines the detail needed for various plan elements. Thus, the sponsor should discuss what the minimum requirements are to complete their internal plans as well as coordinate with FAA and FDOT for verification and validation of specific plan elements. The implementation plan should encompass all development projects at the airport, including ongoing projects and maintenance and repair, regardless of their eligibility for FDOT or Federal funding. Documenting the implementation plan is important to ensure stakeholders

understand the recommendations and general intended timing from the Master Plan as well as any other airport projects in progress.

The FAA considers project funding requests through the CIP process. A three- to five-year CIP is typically created by each airport on a rolling basis and based on the airport’s Master Plan recommendations, as available. Each airport typically conducts an annual review to update the CIP based on anticipated plans for project priorities, funding sources, environmental and authority approvals, or estimated costs. As such, a more robust CIP is provided for a three- to five-year period, with the 10- and 20-year Master Plan CIP representing basic planning-level cost estimates and phasing. The short-term CIP may be used for planning and programming funds with the FAA and FDOT and determining which projects may require environmental approvals. It is important that the CIP developed in the implementation plan is realistic and that the sponsor has considered the timing of actions needed to start the project such as relevant and necessary approvals, environmental documentation, and if the local share of funding is expected to be available when needed.

This chapter addresses the following facilities implementation topics:

1. Project Attributes
2. Scheduling
3. Documentation
4. Joint Automated Capital Improvement Program (JACIP)

**Project Attributes**

Depending on the airport sponsor, different attributes should be included in the CIP documented in the facilities implementation plan. A minimalistic plan may only list the projects by name along with their estimated cost, anticipated project start, and the expected funding sources. Funding sources and their applicability are discussed further in Financial Feasibility Analysis chapter. A more robust plan may also include the items shown in **Table 23**. The FAA transmits an annual letter to airport sponsors regarding specific details on the projects listed in their ACIP. **Tables 24** and **25** show examples of a minimalistic and a more robust CIP, respectively.

TABLE 23. EXAMPLE OF A PROJECT ATTRIBUTE SHEET

Project	Taxiway A Rehabilitation Construction	Attribute Notes	Project	Taxiway A Rehabilitation Construction	Attribute Notes
<b>Identification</b>	Airport Project #1B	Airport’s internal project number and title	<b>Est. Cost</b>	\$2,700,000	Total project cost; cost breakdown by project component (i.e., pavement, lighting, administration, etc.) will also be required.
<b>Description</b>	Construction of Rehabilitation (mill & overlay) of 8,000 Linear Feet of Taxiway A	Descriptive title that matches FAA SOAR format, uses designations on approved ALP, and includes quantities. A sketch should be included. Design and construction are typically separate FAA grants.	<b>Funding Sources</b>	FAA Entitlements, FAA Discretionary, Local Funds	List of the funding sources anticipated for the project to demonstrate the availability of funds has been considered.
<b>Justification</b>	Pavement is in disrepair and has numerous cracks, which have resulted in FOD. The last rehabilitation took place in 2008 and the current PCI is 50	FAA Order 5100.38 provides specific eligibility requirements for each type of project; include photos when appropriate.	<b>Prerequisites/ Interdependencies</b>	Engineering Plans & Specs Completion and Contractor Award	Discussion of any tasks/ projects that need to take place before or in conjunction with this project. Displays that the project is ready to begin.
<b>Project on approved ALP</b>	Yes	Projects must be shown on approved ALP to be eligible for funding	<b>Environmental Requirements</b>	Environmental Assessment (EA); expected approval in 2018	Explanation of the environmental approval requirements and timeline
<b>National Priority Ranking</b>	68	Based on an FAA formula that ranks airport development with FAA goals and objectives (FAA Order 5100.39 ACIP)	<b>Responsible Parties</b>	Consultant is lead agency for construction administration and airport advisory committee is support and operations implementation	List of who is responsible for what task.
<b>Est. Start Date</b>	August 2020	Allows for FAA to program the funds with correct year	<b>Special Considerations</b>	Must be phased to ensure aircraft can still access runway. Existing lighting and signage will need to be reinstalled following rehabilitation	Items that are unusual and need to be ensure they are addressed.
<b>Est. End Date</b>	May 2020	Provides information on the length of the project and display that a design project will be completed in time for the next grant cycle.	<b>Key Milestones</b>	Job Mix Formula Approval, Passing of Test Strip, Substantial Completion, Reopening of Taxiway.	Key items for project completion. A detailed scope will be necessary prior to project start.
<b>Quantity</b>	8,000 Linear Feet	Ensure consistent unit of measurement used throughout			

Source: Kimberly-Horn and Associates, INC., 2017

Broad projects illustrated in the ALP may be broken down into smaller projects based on the project stage or phase—such as environmental, design, and construction—or specific phases of a single construction project (i.e., Phase I – Taxiway A1 and Phase II – Taxiway A2). Environmental Assessments are typically completed as a separate project due to the larger effort required. As such, it is likely to be shown as a separate item. The project description should list which components are included with the specific project and the cost estimate. For example, the project titled “Relocation of Air Cargo Facilities” may be listed to include all associated projects (e.g., site selection study, design and construction of new facility, road relocation, new taxiways and aprons) or could be divided into smaller, individual projects. Descriptions should follow the FAA’s SOAR planning module when submitted to FAA for funding consideration. Appendices to the Master Plan may be used as necessary to provide all documentation requested by the sponsor.



### Scheduling

A review of the interrelationships between the projects and the sponsor’s opportunities and constraints should be conducted and an achievable sequence that minimizes conflicts defined. The airport’s financial, environmental, and strategic plans should be examined to determine how the airport will use the Master Plan’s implementation plan. An unrealistic or unusable plan can cause the airport to fall behind schedule quickly, which may jeopardize priority projects or future funding. The FAA and FDOT should also be consulted during this phase to determine the priorities of projects within the overall transportation system. Additional information on project priorities is discussed in the Financial Feasibility Analysis section.

The Master CIP should span the same years as the forecasts with detailed information for the short-term projects. It is recommended that the airport identify triggers, sometimes referred to as planning activity levels (PALs) or trigger points, to alert the planning team as to when projects should be begin, as activity rarely results exactly as forecast-ed. The CIP may list these triggers or PALs under the prerequisites or key activities to identify when the project is needed based on activity as opposed to a specific time frame, especially for large and expensive projects that are tied directly to a certain activity level.

The FAA ADOs recommend the following when scheduling projects in the CIP:



- Obtain environmental approval prior to completing the design, especially when seeking discretionary funding. Categorical Exclusions (CATEX) are required to be submitted when the project is inputted into the JACIP and Environmental Assessments (EA) should be started four to five years prior to the project start.
- Design the project the year or two prior to the construction as a separate grant. This allows for the construction project to be based on the bid pricing and ensures the bid pricing can be held. Sponsor should ensure the project is designed and bid appropriately when construction is anticipated to take place in multiple phases (i.e., multiple FAA grant cycles) as it is unlikely contractors will “hold” prices till the following year. The project may be required to be designed in multiple phases or packaged as such to be bid over several years.
- Review project for potential impacts to NAVAIDs and approach procedures so FAA will have adequate time to analysis and address impacts prior to construction.
- Prioritize the projects within each year or term.
- Make note of the Federal share requested, especially when the state or local share will be higher than expected. A higher than required local share may assist with obtaining Federal funding.
- Consider the availability of annual FAA NPE and Discretionary funding and the National Priority Ranking of the individual projects.

- Plan for submitting pre-application packages to alert the FAA of intent to submit a grant application. Pre-application packages help the FAA ensure the project will have the proper documentation and approvals when the grant application is submitted and allows the FAA to review funding availability.

### Documentation

The facilities implementation plan should include a CIP that can be used as a standalone document and should clearly present the airport’s ongoing and future projects. The CIP element should also clarify that it is a requested project plan and does not constitute an agreement to fund the projects by any source. The CIP may be simple or more detailed depending on the sponsor and their needs. **Table 24** provides an example of a more simplistic CIP that may be included in a Master Plan Update for short-term planning while **Table 25** displays a more robust CIP.

It is important to document the plan in such a way it can be updated regularly to reflect new goals, priorities, opportunities, and constraints. This document may also assist other funding agencies by providing them information to determine their funding allocation and involvement. As such, the CIP should be reviewed regularly by FAA ADO, FDOT, and the sponsor to confirm project eligibility and funding availability. It is recommended that the airport sponsor also incorporate the local funding authority and FDOT into these reviews.

**TABLE 24. BASIC CIP EXAMPLE**

Potential Allocation of Short-Term CIP Funding

Year	Project Number	Project	Entitlement	FAA%	Discretionary	FAA%	FDOT	FDOT%	Local	Local%	Total
<b>2019</b>	19-01	Design & Bidding Services T-hangars and/or Individual Storage Hangars	\$	0.0%	\$	0.0%	\$56,556	80.0%	\$14,139	20.0%	\$70,695
	19-02	Runway 13/31 Rehabilitation Design	\$238,050	90.0%	\$	0.0%	\$21,160	8.0%	\$5,290	2.0%	\$264,500
	19-03	QT M4000 Fueling Terminal - Self-Service Fuel Farm	\$	0.0%	\$	0.0%	\$11,700	80.0%	\$2,925	20.0%	\$14,625
	19-04	Fuel Farm Generator	\$_____	0.0%	\$_____	0.0%	\$31,528	80.0%	\$7,882	20.0%	\$39,410
				\$238,050	61.2%	\$	0.0%	\$120,944	31.1%	\$30,236	7.8%
<b>2020</b>	20-01	Runway 13/31 Rehabilitation Construction	\$456,046	8.8%	\$4,233,954	81.2%	\$416,000	8.0%	\$104,000	2.0%	\$5,200,000
	20-02	Construction T-hangars and/or Individual Storage hangars	\$	0.0%	\$	0.0%	\$743,000	80.0%	\$185,861	20.0%	\$929,305
	20-03	Southwest Airport Access Road Improvement - Design	\$	0.0%	\$	0.0%	\$741,600	80.0%	\$185,400	20.0%	\$927,000
	20-04	Air Traffic Control Tower - 3020 Gate X Voice Switch Console	\$_____	0.0%	\$_____	0.0%	\$120,000	80.0%	\$30,000	20.0%	\$150,000
				\$456,000	6.3%	\$4,233,954	58.6%	\$2,012,044	28.0%	\$505,261	7.0%
<b>2021</b>	21-01	Airfield Environmental Assessment - Obstruction Clearing - Phase I	\$90,000	90.0%	\$	0.0%	\$8,000	8.0%	\$2,000	2.0%	\$100,000
	21-02	Apron Expansion and Taxiway A Final Realignment - Design	\$60,000	21.8%	\$187,500	68.2%	\$22,000	8.0%	\$5,500	2.0%	\$275,000
	21-03	Airfield Signage Plan - Design and Construction Except Runway 13/31	\$	0.0%	\$	0.0%	\$1,013,390	80.0%	\$253,348	20.0%	\$1,266,738
	21-04	Southwest Airport Access Road Improvement - Construction	\$	0.0%	\$8,343,000	90.0%	\$741,600	8.0%	\$185,400	2.0%	\$9,270,000
	21-05	New Fuel Farm Replacement - Design	\$_____	0.0%	\$_____	0.0%	\$160,000	80.0%	\$40,000	20.0%	\$200,000
			\$150,000	1.3%	\$8,530,500	76.8%	\$1,944,990	17.5%	\$486,248	4.4%	\$11,111,738
<b>2022</b>	22-01	Develop Wildlife Hazard Management Plan/Assessment	\$90,000	90.0%	\$	0.0%	\$5,000	5.0%	\$5,000	5.0%	\$100,000
	22-02	Apron Expansion and Taxiway A Final Realignment - Construction	\$	0.0%	\$2,700,000	90.0%	\$	0.0%	\$300,000	10.0%	\$3,000,000
	22-03	Design and Build Commercial Hangar for Aviation Service Providers	\$_____	0.0%	\$_____	0.0%	\$500,000	50.0%	\$500,000	50.0%	\$1,000,000
			\$90,000	2.2%	\$2,700,000	65.9%	\$505,000	12.3%	\$805,000	19.6%	\$4,100,000
<b>2023</b>	23-01	New Fuel Farm Replacement - Construction Phase 1	\$	0.0%	\$	0.0%	\$800,000	80.0%	\$200,000	20.0%	\$1,000,000
	23-02	Land Acquisition	\$_____	0.0%	\$_____	0.0%	\$400,000	80.0%	\$100,000	20.0%	\$500,000
			\$	0.0%	\$	0.0%	\$1,200,000	80.0%	\$300,000	20.0%	\$1,500,000
		Total Short-term Projects	\$934,096		\$15,454,454		\$5,791,978		\$2,126,745		\$24,307,273
		Total Percentage	3.8%		63.6%		23.8%		8.7%		100.0%
		Annual Average Cost	\$3,090,891		\$3,090,891		\$1,158,396		\$425,349		\$4,861,455

Source: Leesburg International Airport Master Plan Update, AVCON, INC.

**TABLE 25. ROBUST CIP EXAMPLE**

Airport Name										
Airport Capital Improvement Program (20Xx-20Xx)										
DATE: MM/DD/YY										
Fiscal Year	1. Airport:	2. State: FL		3. NPIAS No:			36-XXX			
	Project Description	Federal Funds		State Funds	Sponsor/Local Funds	Private Funds	Total Funds	Environ. Status	Start Date	Comp. Date
Non-Primary Entitlement		Discreet. Funds								
On-Going Projects	Westside Apron Rehabilitation (FAA AIP Project Number)	\$150,000	\$30,000	\$10,000	\$10,000		\$200,000	Environ. Assessment	MM/YY	MM/YY
	North T-Hangar Rehabilitation (State Project Number)			\$37,500	\$37,500		\$75,000	CATEX	MM/YY	MM/YY
	Parking Lot Resurfacing (Airport Project Number)				\$15,000		\$15,000	CATEX	MM/YY	MM/YY
<b>Total On-Going</b>		\$150,000	\$30,000	\$47,500	\$62,500	\$0	\$290,000			
20XX	Runway 13 Reconstruction Design	\$103,500		\$5,750	\$5,750		\$115,000	Environ. Assessment	MM/YY	MM/YY
	Environmental Assessment (Tree Removal & Taxiway)	\$46,500	\$88,500	\$7,500	\$7,500		\$150,000	CATEX	MM/YY	MM/YY
	Westside T-Hangar (12 Bay) Design and Construction					\$500,000	\$500,000	Environ. Assessment	MM/YY	MM/YY
<b>Totals 20XX</b>		\$150,000	\$88,500	\$13,250	\$13,250	\$500,000	\$765,000			
20XX	Runway 13 Reconstruction Phase I Construction	\$150,000	\$413,625	\$31,313	\$31,313		\$626,250	Environ. Assessment	MM/YY	MM/YY
	Lighting Upgrades			\$25,000	\$25,000		\$50,000	Short EA	MM/YY	MM/YY
<b>Totals 20XX</b>		\$150,000	\$413,625	\$56,313	\$56,313	\$0	\$676,250			
20XX	Runway 13 Reconstruction Phase II Construction	\$150,000	\$37,875	\$10,438	\$10,438		\$208,750	Environ. Assessment	MM/YY	MM/YY
	Terminal Maintenance				\$12,000		\$12,000	-	MM/YY	MM/YY
	Tree Removal Design		\$22,500	\$1,250	\$1,250		\$25,000	Environ. Assessment	MM/YY	MM/YY
<b>Totals 20XX</b>		\$150,000	\$60,375	\$11,688	\$23,688	\$0	\$245,750			
20XX	Tree Removal Construction	\$90,000		\$5,000	\$5,000		\$100,000	Environ. Assessment	MM/YY	MM/YY
	Conventional Hangar (200' x 200')					\$990,000	\$990,000	Short EA	MM/YY	MM/YY
<b>Totals 20XX</b>		\$90,000	\$0	\$5,000	\$5,000	\$990,000	\$1,090,000			
20XX	Parallel Taxiway - Design	\$198,000		\$11,000	\$11,000		\$220,000	Environ. Assessment	MM/YY	MM/YY
<b>TOTALS 20XX-20XX</b>			\$738,000	\$562,500	\$97,250	\$109,250	\$1,490,000			

Source: Kimley-Horn and Associates, Inc., 2016

**Joint Automated Capital Improvement Program**

To better assist with implementing the CIPs from a plan to a physical project, FDOT and FAA have collaborated in a process referred to as the Joint Automated Capital Improvement Program, or JACIP. Airports take the information in their CIP and input it electronically into the JACIP. It is important that the CIP from the Master Plan is presented in a format that allows it to be entered into the JACIP and contains all appropriate information. Funds must be “programmed” through this system for the grant funds to be made available to the sponsor. The process is designed to be an ongoing collaboration between the sponsor, FAA, and FDOT so all parties understand how to effectively fund projects to allow the airport to meet its goals.

The first step of JACIP following the completion of a Master Plan is to update the CIP through the online portal. The sponsor should input the projects listed on their CIP for the planning horizon, including expected funding sources. This process helps transmit realistic, up-to-date funding needs so the FAA and FDOT can adequately plan and have a list of projects that are awaiting funding if additional funds become available. More details on funding sources and agency priorities are available in the Financial Analysis chapter of this Guidebook. The FAA ADO and FDOT are able to review and evaluate projects inputted into JACIP and identify projects most likely to be funded based on funding priorities and availability. The projects identified by the FAA ADO are then entered into the FAA’s SOAR. The FDOT uses the JACIP and the ensuing FAA inputs to develop the statewide aviation work program.

While the master plan will have a CIP for the planning horizon, the subsequent three to five years are the most critical to the FAA and need the most detail inputted into the JACIP. As the FAA must program the funding years in advance, the sponsor should not expect to receive additional funding for modified or new projects beyond what is listed in the three-year CIP, as shown in the JACIP. As such, the sponsor should update the JACIP annually and when requested by FDOT or the FAA.

This will allow for the FDOT and FAA to have the most up to date information and ensure that the sponsor is prepared to complete the project as the funds become available. Additional guidance on the JACIP process is available once the sponsor is logged into the portal or through discussions with the FAA ADO or FDOT.

The sponsor is responsible for ensuring the project is ready to be implemented when the funding is available. The FAA has established a series of recommendations for the projects listed in the five-year CIP to ensure the project will be ready to begin. Five years prior to the start of the project the sponsor should begin actively planning for the project by ensuring the project justification is still valid and based on current conditions, drafting an initial scope and cost estimate, identify the appropriate environmental approval and funding sources, and begin coordination with relevant stakeholders. Four years prior, sponsors should review impacts to other project or infrastructure, such as NAVAIDS or approach procedures, so FAA coordination can begin, refine the project scope and cost estimates, and initiate the environmental approval process.

Three years prior, planning and environmental approvals should be completed, DBE program verified, land acquisitions completed as necessary, and information in JACIP is up to date. Within two years prior to project start, the sponsor should ensure the scope is refined, the project is shown on the approved ALP, applicable agreements are finalized, and the JACIP is up to date.

The year before project start, the sponsor should ensure the JACIP is up to date, the proper paperwork has been submitted to the FAA, and local funding and municipal approvals are in place. If a project is not ready the implementation year it is likely that any discretionary funds for the project will not be available for an additional two years due to the three-year CIP cycle.

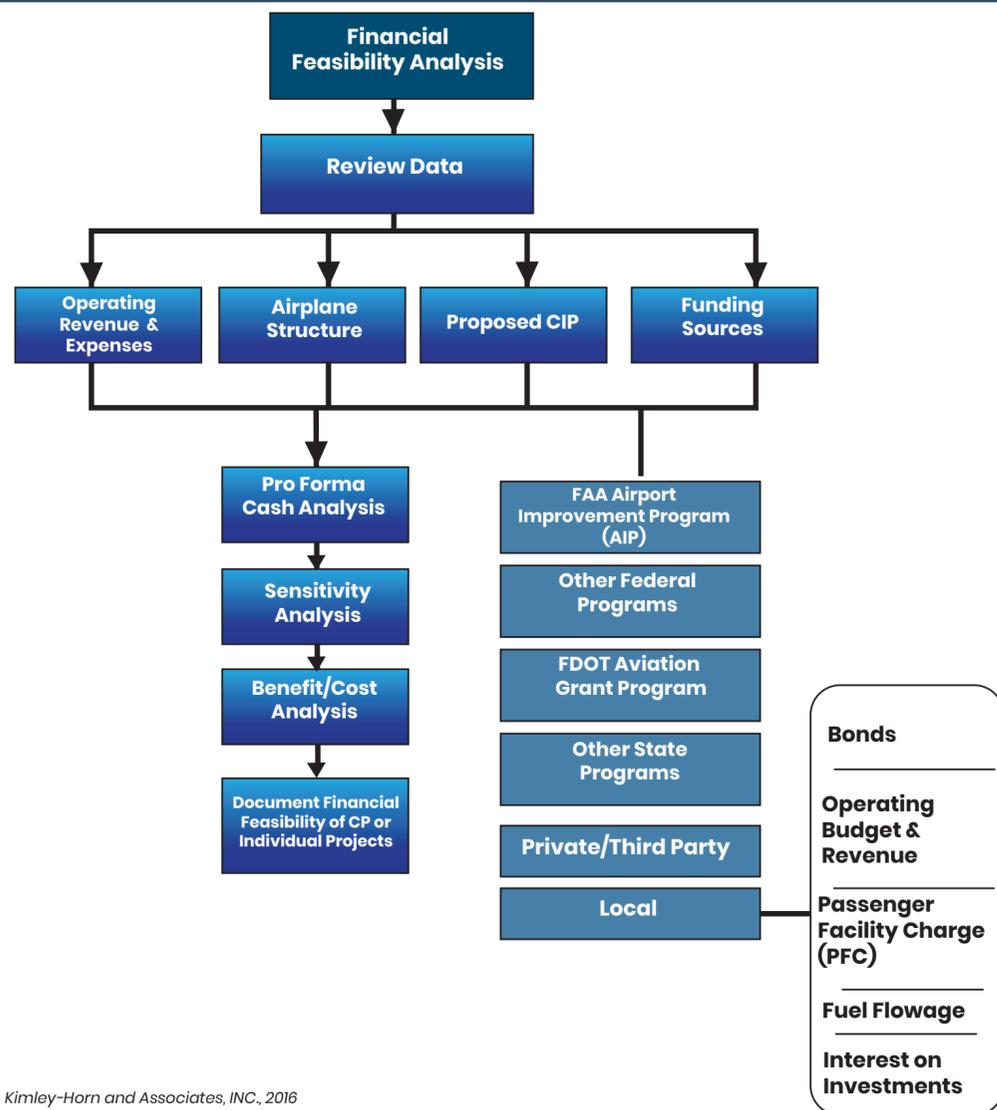
At least one year prior to funding request the sponsor should confirm:

- Project is shown on ALP
- Environmental Determination received
- Meets FAA/FDOT justification and eligibility
- FAA Form 5010-1 Airport Master Record is up to date
- Exhibit “A” Property Inventory Map on file with FAA
- Exhibit “C” Title Option on file with FAA
- Airport maintains a Pavement Maintenance Program
- Disadvantage Business Enterprise (DBE) Program in place

To help facilitate the implementation of projects, the FAA works with the sponsor annually and conducts a state and system wide review of the five- and three-year CIPs. Starting in October FDOT, FAA, and individual sponsors meet to discuss the upcoming projects and refine the CIP. During this time, new policies and priorities may be communicated to the sponsors. The sponsor should submit a pre-application to the FAA in November for the next year’s project and ensure the JACIP is up to date by December 30th. If a sponsor is choosing to carryover their NPE by not completing a project in the given year, this should be declared during the summer. From January to March the FAA will review the five-year CIP to ensure it is consistent with prior plans and FAA goals and priorities and recommend projects for discretionary funding. During March and April, the FAA refines the three-year CIP based on priorities and availability of funds. The final grant application is due to the FAA by the following July and executed grant offers should be returned to the FAA in August.

The purpose of the financial feasibility task is to ensure the projects identified in the CIP, as a result of the Master Plan's analysis, are in line with anticipated available funding. The information contained in this chapter, as well as the information contained in FAA AC 150/5070-6B, *Airport Master Plans*, identifies what is required to demonstrate an airport's ability to fund projects identified in a Master Plan. As shown in **Figure 29** the financial feasibility analysis identifies funding sources based on the airport's financial position and role and provides a plan for funding projects in both the short- and long-term time frames. This step is important to ensure the CIP is realistic as it demonstrates an ability to fund the local share of the project. The CIP is typically utilized by several entities beyond the sponsor, such as the FDOT and FAA, to plan their funding allocations. The process of obtaining project funding will be competitive and sponsors need to strategically position the airport to receive and utilize non-local funds. Preparing the financial analysis is the first step in proving the airport is ready and able to begin projects. When the total project cost is between \$10 million and \$50 million, FDOT requires a project economic feasibility analysis which is described at the end of this section.

**FIGURE 29. FINANCIAL FEASIBILITY ANALYSIS**



The CIP is typically utilized by several entities beyond the sponsor, such as the FDOT and FAA, to plan their funding allocations. The process of obtaining project funding will be competitive and sponsors need to strategically position the airport to receive and utilize non-local funds. Preparing the financial analysis is the first step in proving the airport is ready and able to begin projects. When the total project cost is between \$10 million and \$50 million, FDOT requires a project economic feasibility analysis which is described at the end of this section. It is important to determine in the scoping process if the financial feasibility analysis needs to be a stand-alone chapter or if the CIP and facilities implementation plan provides enough information on how CIP projects will be funded. It is important that the analysis provides the information necessary for the sponsor to make informed decisions regarding the airport's future development needs and funding requirements.

This chapter addresses the following aviation financial feasibility analysis topics:

1. Funding Sources
2. Financial Feasibility Analysis

### Funding Sources

Airport sponsors need to review all sources of available funding when identifying, prioritizing, and pursuing project implementation. Innovative and alternative funding sources should be analyzed for applicability and to assist with fulfilling funding needs beyond local sources. This may include Federal, state, regional, local, or private funds, as described below.

#### Federal

The FAA AIP provides grants to public agencies for the planning and development of public-use airports that are included in the NPIAS through the Airport and Airway Trust Fund. FAA grants typically cover 75% of eligible costs for large and medium primary commercial hub airports and 90% of eligible costs for small primary, reliever, and GA airports, based on statutory requirements. The current NPIAS report contains airport categorizations.

Discretionary funding is offered only if there are funds available after entitlements are apportioned. Additionally, entitlement funds must be used first for projects when asking for discretionary funds.

The FAA determines which projects will be funded based on current national priorities through its national prioritization system because funding is always limited. Highest priority is given to projects that improve safety, security, reconstruction, capacity, and standards. FAA Order 5100.39A *Airport Capital Improvement Plan* provides the National Priority System (NPS) equation to calculate the National Priority Ranking (NPR) of individual projects. The NPR, 0 to 100, serves to rank airport development projects in accordance with agency goals and objectives. Typically, a NPR of 60 and above are considered competitive projects for discretionary funding. The equation applies weighting to the role and size of airport, the purpose of the project, the project component (e.g., runway, taxiway), and the type of work being completed (e.g., extension, reconstruction).

There are two basic types of funding available directly to airports: Apportionments (called entitlements) and discretionary. Major entitlement categories consist of primary, cargo, and non-primary—which typically are for GA airports—as well as state apportionment. After all entitlement obligations are met, the remaining funds are considered discretionary.

The airport noise and military airport programs typically receive first priority from discretionary funds.

Passenger entitlements for commercial service airports are calculated based on the number of passenger boardings at an airport in the prior year and the amount of AIP funding available in that year as determined based on the authorization level from Congress. Cargo entitlements are based on the airport's share of total U.S. landed cargo weight, but may not exceed more than eight-percent of the total available apportionments. To qualify, the airport must have more than 100 million pounds of total annual landed weight from cargo-only aircraft. These calculations can be found in *FAA Order 5100.38D, Airport Improvement Program Handbook*.

Non-primary entitlements (NPE) funds, are specifically provided to airports listed in the NPIAS as GA airports, including relievers. The NPE available to a sponsor is calculated at 20% of the total AIP eligible development funding shown on the five-year ACIP, with a cap of \$150,000 annually. This typically results in airports showing a minimum of \$750,000 in project costs on the five-year ACIP.

Entitlements may be carried over for up to three years, but expire after four years. This is useful when there is no Federal project to complete in a specific year or a larger sum of Federal funds is needed for a project than the annual NPE amount, such as a runway reconstruction.

As discussed earlier, discretionary funds can be used for projects, however, the airport sponsor must apply directly to the FAA to request discretionary funding.

A sponsor can use these grants on most airfield capital improvement projects (e.g., runway rehabilitation, taxiway improvements, drainage improvements, ALP or ALP updates, and navigational aids). Regular operational costs such as training, marketing plans, art installations, mowing, or salaries and some revenue-producing projects, such as parking facilities, are ineligible. When determining whether a specific project is eligible, the FAA Order 5100.38D should be referenced or discussed with the FAA ADO

The FAA also requires the airport sponsor to ensure the following regarding the airport and project:

- Airport is in the NPIAS
- Is depicted on the currently approved ALP
- Involves more than \$25,000 in AIP funds
- Is consistent with regional development plans when applying for AIP funding (When a single project cannot meet the \$25,000 minimum threshold, it may be combined with another related project and can then be eligible for NPE eligibility)
- Sponsorship requirements have been met
- Has sufficient and available funds for the local and/or state matching shares
- Will be completed without undo delay

Airport sponsors are obligated through grant assurances once a grant offer is accepted. There are currently 39 grant assurances that range from operating and maintaining the airport in a safe and serviceable condition, not granting exclusive rights, mitigating hazards to airspace, to using airport revenue properly. These assurances typically last 20 years, but their lifespan may depend on the type of recipient, useful life of the facility, and other conditions. Grant assurances are indefinite when federal funds are used to acquire land for the airport.

The FAA has several programs geared toward specific topics that utilize AIP funding; several examples are included below:

- **Noise Compatibility Program**
  - Funding for projects related to the study of the noise levels and mitigating the noise derived directly from airports. Typically, 80-percent of a noise program implementation cost is covered by the FAA ([www.faa.gov/airports/environmental/airport\\_noise/](http://www.faa.gov/airports/environmental/airport_noise/))
- **Acquiring Land for Airports and Relocation Assistance**
  - Assistance with acquiring property for development projects or noise compatibility programs and helping the private property owners relocate ([www.faa.gov/airports/environmental/relocation\\_assistance/](http://www.faa.gov/airports/environmental/relocation_assistance/))
- **Military Airport Program (MAP)**
  - Grants to civil sponsors of military airfields for the development of aviation facilities for the public and to assist in converting former military airfields to public use to add system capacity. Funds may be used for typically ineligible projects such as parking lots, hangars, and roads ([www.faa.gov/airports/aip/military\\_airport\\_program/](http://www.faa.gov/airports/aip/military_airport_program/))

Other non-FAA Federal programs are also available and may be reviewed at [www.grants.gov](http://www.grants.gov); several examples include:

- **U.S. Fish and Wildlife Service (USFWS)**
  - Provides several programs to assist with habitat conservation and restoration, treatment of invasive species, and conservation of endangered and threatened species.
- Department of Homeland Security (DHS) Security Grants
  - Provides grants to enhance the ability of authorities to prepare, prevent, and respond to terrorist attacks and other disasters. Grants may be provided for FEMA disaster assistance, FEMA non-disaster preparedness, and research of new technologies
- **U.S. Department of Agriculture (USDA)**
  - Provides assistance with water quality improvements, wetland restoration, endangered species habitat, and developing renewable energy in rural areas
  - Environmental Protection Agency (EPA)
  - Provides grants to increase energy efficiency and reduce harm on the environment such as retrofitting vehicles to reduce emissions and rebates for energy star appliances
- **Historical Preservation Fund (HPF)**
  - Provides grants to preserve historical sites. Sites must typically be listed on the National Register of Historic Places

## State

FDOT established the Aviation Grant Program to provide for a safe, efficient, and cost-effective statewide aviation transportation systems. The program is funded through the State Transportation Trust Fund, which receives funds from the state's aviation fuel tax and discretionary capacity funding. The program funds projects for planning,

designing, constructing, and maintaining public use aviation facilities in the areas of safety, security, preservation, capacity improvement, land acquisition, and economic development. FDOT project priorities include maximizing allocation of federal funds, state licensing standards, safety, security, preservation, and increasing capacity.

To receive state funding, an airport must be included in the FASP. Airport and Spaceport project eligibility can be found in the Florida Aviation Project Handbook and Florida Spaceport Improvement Program Project Handbook. When a project is federally funded, FDOT will provide a certain amount of the non-federal share match depending on the category of airport. Commercial service airports may receive up to 50% share and GA up to 80% of the remaining project cost that is not funded by the FAA. When no federal funding is available, these percentages may be the same for the entire project cost. For economic development projects—projects that encourage the airport to become self-supporting financially such as an industrial park or hangars/buildings that will be leased—FDOT may cover up to 50% of the project cost at general aviation airports. Specific project eligibility should be discussed with FDOT.

In special cases, FDOT may provide up to 100% funding for strategic airport investment projects. These projects must provide important access and on-airport capacity improvements; maximize opportunities in international trade, logistics, and the aviation industry; achieve state intermodal transportation goals; and demonstrate the feasibility and availability of matching funds.

Additionally, pursuant to Section 288.0656 (2) FS, the state can provide counties and communities funding through the Rural Economic Development Initiative (REDI). The applicant must meet the statutory definition of "rural" per Section 288.0656 (2)(e) and must have three or more of the "economic distress" conditions per Section 288.0656 (2)(c). The initiative is meant to assist communities that are facing extraordinary challenges while attempting to improve their economies in terms of personal income, job creation, average wages, and strong tax bases. Simply being eligible as a rural county does not eliminate the need to provide local funds all together. Municipalities eligible for REDI funding must apply for the opportunity to receive a waiver or reduction in funding match needed. This program does not provide a new source of funding to municipalities, it is intended to minimize the local match to eligible counties and communities.

### Florida Specific Information!



FDOT established the Aviation Grant Program to provide for a safe, efficient, and cost-effective state wide aviation transportation systems. The program funds projects for planning, designing, constructing, and maintaining public use aviation facilities in the areas of safety, security, preservation, capacity improvement, land acquisition, and economic development. FDOT project priorities include maximizing allocation of federal funds, state licensing standards, safety, security, preservation, and increasing capacity.

### Florida Specific Information!



The Rural Economic Development Initiative (REDI) minimizes the local match contribution for communities facing challenges while helping improve their economic conditions. Applicant must meet the definition of rural and have three or more economic distress conditions.

There are a variety of other funding options available to Florida's airports. Some funding programs, such as the SIS, have certain eligibility and project specific requirements that must be met in order for funding to be available. Understanding the existing funding sources as well as their availability and applicability to a specific airport or airport project is a critical element of the financial analysis portion of an Airport Master Plan. State programs applicable to airports include:

- **Florida Fish and Wildlife Conservation Commission (FWC)**
  - Projects that address conservation needs as identified in the Florida's State Wildlife Action Plan
- **Energy and Climate Commission (ECC)**
  - Projects for energy efficiency and renewable energy technology
- **Florida Department of Environmental Protection (DEP)**
  - Projects that improve water quality
- **Florida Division of Historical Resources**
  - Projects for historical preservation
- **State Infrastructure Bank (SIB)**
  - Provides loans to help local share of project
- **Strategic Intermodal System (SIS)**
  - Once an airport is included in the SIS, funds are available for capacity projects associated with ground transportation, and airside, landside, and terminal connections
  - For additional information, visit the [SIS Funding Strategy website](#)
- **Transportation Regional Incentive Program (TRIP)**
  - Projects that will generate additional capacity through growth in the transportation program

Sponsors should continue to look for other state grants to fund projects specific to their airport. Grants may be available for art installations, utility extensions, tourism, research, and economic development. As part of the financial analysis portion of a Master Plan, the consultant team should identify what projects in the CIP are eligible for certain funding options. Identifying eligible funding and matching it with CIP projects will help ensure that the projects identified in the CIP have adequate funding.

## Metropolitan Planning Organization (MPO)

In accordance with s. 339.175, F.S., the state's 26 metropolitan planning organizations, referred to in this section as MPOs, shall develop a transportation improvement program (TIP) for the area within the jurisdiction of the MPO. The plans and programs for each metropolitan area must provide for the development and integrated management and operation of transportation systems and facilities.

Each MPO is responsible for developing, annually, a list of project priorities and a transportation improvement program and shall submit the list to the appropriate FDOT district by October 1 of each year. This list of project priorities must be used by the district in developing the district work program and the MPO in developing its transportation improvement program. These priorities are to be funded with state or Federal funds (includes specific urban funds allocated to the MPO) within the time period of the TIP

and enhance the integration and connectivity of the transportation system, across and between modes for people and freight.

## Local

Depending on the airport sponsor, a variety of local municipal funding opportunities are available. Whether these funding mechanisms are available for an airport to use will need to be determined when reviewing the airport's financial structure; privately-owned airports may be limited in the type of municipal funding mechanisms.

- **Bonds**
  - A financial mechanism commonly used by municipalities to finance long-term capital projects. There are several types of bonds available to some airport sponsors:
    - **General Obligation (GO)** – Backed by the creditworthiness and taxing power of the sponsor that usually require voter approval. GO bonds typically have lower interest rates due to their high level of security.
    - **General Airport Revenue Bonds (GARB)** – Usually used at larger commercial service airports. The bond is based on the sponsor's revenues to repay the debt. GARBs are popular choices when revenue is available as they do not place debt on the taxpayers or affect the bonding capacity of the sponsor. Interest rates may be higher than GO bonds due to their higher risk.
    - **Special Facility Revenue Bonds (SFB)** – Customarily issued for construction of a facility and backed by the future revenue generated at the facility. SFBs are useful in developing special use or revenue producing not eligible for Federal funding.
    - **Industrial Development** – Issued to construct an airport industrial park or facilities that may attract non-aeronautical revenue opportunities such as a Foreign Trade Zone (FTZ).
    - **Hybrid Source Bonds** – The bonds are airport revenue bonds combined with a secondary bond type/fund source such as PFCs, CFCs, GO bonds, or another funding pledge for the specific project. Hybrid source bonds are backed by two or more independent revenue streams. Revenues generated from the facility are intended to meet all bond repayment obligations, though the credit of the bond issuer serves as an additional commitment to the debt.
- **Airport/Sponsor Customer Facility Charge (CFC)**
  - Charges assessed to airport customers for the use of a non-aeronautical service at the airport. Typically paid by rental car customers based on the number of days the user has rented the vehicle or service fee for a taxi to or from the airport.
  - FAA approval is not required, but an agreement between the airport and the company is required
- **FAA-Approved Passenger Facility Charges (PFC)**
  - Authorized through *14 CFR Part 158, Passenger Facility Charges*, PFCs are gathered through airlines operating at a commercial airport. As of 2019, the current cap per a flight segment is \$4.50 with a maximum of \$18 per

passenger on a round trip. The PFC collected repay FAA approved project costs.

- Projects must be approved by the FAA and preserve, enhance, or make a significant contribution to the safety, security, or capacity of the national air transportation system, reduce noise or mitigate noise impacts from the airport, enhance competition between air carriers, or reduce congestion. Additional projects may be eligible based on discussions with the FAA ADO.
- *FAA Order 5500.1, Passenger Facility Charge* provides guidance and procedures on establishing, implementing, and managing a PFC program. The FAA also provides additional information, guides, and tools to PFC stakeholders here.

## Private

Private funds include parties that are outside of the airport's governing body. This may be a company or an individual looking to partner with or do business at the airport or aviation advocates hoping to assist the airport. Before accepting private funds, it is recommended to discuss any implications or restrictions with the FAA ADO and FDOT to avoid any potential complications. It is important to note that the airport must still adhere to all Federal and state regulations and standards when using these funds.

- **Third Party**
  - Funds provided by a third-party such as a developer or a tenant to finance a construction project. Typically, the third-party would lease the facility for a period of years in lieu of fees as they provided the funding for the project. It is important that the airport sponsor retains ownership of the underlying property if on-airport and the facility ownership reverts to the airport sponsor upon expiration of the lease. It should be noted that FDOT will not provide reimbursements to third-parties, only the airport sponsor. Examples of this type of funding include corporate hangars, terminals, and cargo facilities
- **Charitable**
  - Charitable donations may be made to the airport for overall operations and matching share fund or for specific projects. In some cases, charitable donations were made by the original founders of an airport or pilots associations

Additional information on funding may be found in TRB's ACRP Synthesis 1, *Innovative Finance and Alternative Sources of Revenue for Airports* examines capital funding and revenue sources and TRB's ACRP Report 121, *Innovative Revenue Strategies – An Airport Guide* provides tools to improve airport revenue streams, recover costs, and achieve operational efficiencies.

## Financial Feasibility Analysis

### Airport Sponsor Financial Structure

The financial feasibility analysis should focus on short-term projects with more general information being provided for mid- and long-term projects since these projects may shift in priority and funding is less certain. It is likely than a larger commercial service airport would complete a more in-depth analysis than a rural GA airport.

The airport sponsor may be an authority, local municipality, combined counties, state, another entity, or a privately-owned entity. The airport may operate as an enterprise fund that is separated from the municipalities' general fund but is overseen by the

board, or it may be run by an authority that is an entirely separate entity from the local municipality. The differences between these structures may greatly impact the funding sources and method for accepting funds. Consequently, the airport's financial structure is typically reviewed first to ascertain the factors that may influence the operating budget and cash flow.

The structure will also provide the budgeting and finance processes to ensure the analysis can be properly integrated. Additional constraints such as Bond Ordinances, Airline Use and Lease Agreement (AULA), and existing lease documents also need to be analyzed. These legal documents may place constraints on the sponsor such as the amount of additional debt that can be issued, the rental rates that can be placed on vendors and airlines, and necessary approvals. This is important to consider prior to reviewing the financial capability or feasibility of the recommended airport development.

## Components Of Analysis

A financial feasibility analysis includes reviewing airport revenues and expenses and applying the data to a pro forma cash flow analysis, also referred to as a "what-if scenario." Revenues include those listed above under the airport/sponsor sources of funding. Expenses can include:

- Salaries and benefits
- Insurance
- Legal/professional fees
- Consulting fees
- Utilities
- Office expenses
- Advertising
- Travel/conference expenses
- Training
- Fuel
- Maintenance and repairs
- Bad debts
- Capital improvement projects and equipment purchases
- Bond repayments

## Pro Forma Cash Flow Analysis

While not required, the pro forma cash flow analysis would reveal if the local share of each project can be funded with the anticipated available revenue. The analysis applies the capital costs, and potentially the future operating and maintenance costs of those projects, listed in the CIP to the airport cash flow to determine the financial feasibility of implementing a project. The current year dollars, inflation factor, or only include specific types of expenses used in the current operating model of the sponsor can be modified to fit the individual characteristics of the airport. These circumstances are typically determined when reviewing the airport's financial structure. The analysis should accurately account for the annual anticipated level of external funding from FAA entitlement, FDOT, or other sources.

Any funding shortfalls identified through the analysis will need to be further analyzed to determine if additional funds may be obtained or how the project schedule can be revised. These findings will help sponsors make informed decisions on which projects to fund and when, how to overcome constraints, and what level of financial support will

be needed in the planning horizon. Lower activity airports should recognize that, if they are dependent on outside funding sources to complete many of the projects, funding may not always be available on the desired time line. This is especially true if the outside funding source includes FAA discretionary funding.

Sponsors should look for alternative and innovative funding sources along with ways to increase revenue to become more self-sufficient if the desired projects identified in the Master Plan appear to be at risk due to anticipated financial conditions.

### Sensitivity Analysis

As applicable, a sensitivity analysis may also be conducted to determine financial risk and help the planning process by reviewing future funding levels for different planning scenarios. The Master Plan forecasts are a planning tool and do not guarantee a certain rate of growth. A sensitivity analysis will help determine how sensitive the plan is to specific revenue sources such as PFCs, which are based on the number of passenger enplanements. This would allow the airport to understand the impacts of reduced operations or revenue. As with the forecasts, the financial feasibility analysis should be treated as a planning tool and not a concrete plan.

### Benefit/Cost Analysis

A BCA examines all costs related to the construction and operation of a project. The FAA uses BCA to assess the benefits of the proposed project against the costs to aviation users. A BCA is required for capacity-related airport projects receiving more than \$10 million in AIP discretionary grants over the life of the project and all airport capacity projects requesting letters of intent (LOIs). The BCA must show that the total benefits outweigh the total costs. The FAA's [Airport Benefit-Cost Analysis Guidance](#) provides more details on specific methodology, benefits, and costs to be utilized in the calculations.

### Return on Investment (ROI) and Internal Rate of Return (IRR)

Return on Investment (ROI) is used to measure the efficiency of an investment compared to other investments by measuring the return against the cost of the investment. It has a similar premise as the BCA, though it is documented as a ratio or percentage whereas BCA is a dollar value. A ROI of 1 is the "break even" point and implies that 100-percent of what was invested in the project will be returned. ROI can be limited by the fact that the time period of the investment is not factored into the calculation, which can skew the comparison between projects. Internal Rate of Return (IRR) is used in capital budgeting to measure and compare the profitability of a project. The investment is considered acceptable if the IRR is greater than the cost of capital as it implies that the project would add value to the airport. Typically, the higher IRR, the more desirable the project is to complete. Care should be given when comparing the IRR for projects with different durations.

### Documentation

The final documentation of the financial feasibility analysis will be utilized by the airport, as well as outside funding agencies, to demonstrate the ability to fund the projects identified on the CIP. Therefore, the final documentation must be easily reviewed and provide thorough supportive information. At a minimum, the financial analysis should include a summary of historical cash flow and existing and future debt service requirements along with the expected funding source of each project in the short term. Airports with commercial service may include rates and charges of airlines, concessionaires, and other pertinent factors. If a BCA has been conducted, it should be included in the documentation along with any electronic spreadsheets utilized in the analysis for future reference.

When the total project cost is between \$10 million and \$50 million, FDOT requires a project economic feasibility analysis with a specific outline. This analysis is intended to clarify the project's purpose, objective, and perspective and demonstrate the project feasibility using one of the analysis methodologies described in this section. The methodology selected should be reviewed and approved by FDOT.

Documentation of the project economic feasibility analysis includes:

1. Outline Overview and Approach:
  - a. Clarify Purpose – Why is the sponsor undertaking this project
  - b. Clarify Objective – Financial project evaluation metrics based on the methodology used
  - c. Specify Perspectives – Evaluate feasibility of the entire project and identify funding sources
2. Collect Annual Data
  - a. Specify General Assumptions – Time period, lifespan, annual rates
  - b. Estimate all Costs by Year – Investment, operating, and other costs
  - c. Estimate Revenues – Traditional fees and rent, tax remittances, and other sources
3. Project Feasibility
  - a. Select and describe traditional analysis methodology
  - b. Complete the analysis
  - c. Provide any additional supplemental material or analysis to support project



### FAA ADVISORY CIRCULARS

[www.faa.gov/regulations\\_policies/advisory\\_circulars/](http://www.faa.gov/regulations_policies/advisory_circulars/)

- FAA AC 70/7460-1L, Obstruction Marking and Lighting
- FAA AC 120-60B, Ground Deicing and Anti-icing Program
- FAA AC 150/5000-17, Critical Aircraft and Regular Use Determination
- FAA AC 150/5050-4, Citizen Participation in Airport Planning
- FAA AC 150/5060-5, Airport Capacity and Delay
- FAA AC 150/5070-6B, Airport Master Plans
- FAA AC 150/5070-7, The Airport System Planning Process
- FAA AC 150/5100-20, Guidance on the Extraction of Oil and Gas on Federally Obligated Airports
- FAA AC 150/5100-14E, Architectural, Engineering and Planning Consultant Services for Airport Grant Projects
- FAA AC 150/5100-17, Land Acquisition and Relocation Assistance for Airport improvement Program Assisted Projects
- FAA AC 150/5200-33B, Hazardous Wildlife Attractants On or Near Airports
- FAA AC 150/5210-15A, Airport Rescue and Firefighting Station Building Design
- FAA AC 150/5220-18A, Buildings for Storage and Maintenance of Airport Snow and Ice Control Equipment and Materials
- FAA AC 150/5230-4B, Aircraft Fuel Storage Handling, Training and Dispensing on Airports
- FAA AC 150-5220-20A, Airport Snow and Ice Control Equipment
- FAA AC 150/5300-13A, Airport Design
- FAA AC 150/5300-14C, Design of Aircraft Deicing Facilities
- FAA AC 150/5300-16A, General Guidance and Specifications for Aeronautical Surveys: Establishment of Geodetic Control and Submission to the National Geodetic Survey (NGS)
- FAA AC 150/5300-17C, Standards for Using Remote Sensing Technologies in Airport Surveys
- FAA AC 150/5300-18B, General Guidance and Specifications for Submission of Aeronautical Surveys to NGS: Field Data Collection and Geographic Information System (GIS) Standards
- FAA AC 150/5300-19, Airport Data and Information Program
- FAA AC 150/5320-6F, Airport Pavement Design and Evaluation
- FAA AC 150/5325-4B, Runway Length Requirements for Airport Design
- FAA AC 150/5325-4C, Runway Length Recommendations for Airport Design
- FAA AC 150/5340-1L, Standards for Airfield Markings
- FAA AC 150/5340-30H, Design and Installation Details for Airport Visual Aids
- FAA AC 150/5360-12F, Airport Signing and Graphics
- FAA AC 150/5360-13A, Airport Terminal Planning
- FAA AC 150/5390-2C, Heliport Design

### ACRP REPORTS

[www.trb.org/Publications/PubsACRPProjectReportsAll.aspx](http://www.trb.org/Publications/PubsACRPProjectReportsAll.aspx)

- ACRP Synthesis 1, Innovative Finance and Alternative Sources of Revenue for Airports
- ACRP Synthesis 2, Airport Aviation Activity Forecasting
- ACRP Synthesis 4, Counting Aircraft Operations at Non-Towered Airports
- ACRP Synthesis 10, Airport Sustainability Practices
- ACRP Synthesis 69 Airport Sustainability Practices—Drivers and Outcomes for Small Commercial and General Aviation Airports
- ACRP Synthesis 92 Airport Waste Management and Recycling Practices
- ACRP Report 4, Ground Access to Major Airports by Public Transportation
- ACRP Report 10, Innovations for Airport Terminal Facilities
- ACRP Report 12, An Airport Guide for Regional Emergency Planning for CBRNE Events
- ACRP Report 20, Strategic Planning in the Airport Industry
- ACRP Report 25, Airport Passenger Terminal Planning and Design, Volume 1: Guidebook and Volume 2: Spreadsheet Models and User's Guide
- ACRP Report 26, Guidebook for Conducting Airport User Surveys
- ACRP Report 38, Understanding Airspace, Objects, and Their Effects on Airports
- ACRP Report 40, Airport Curbside and Terminal Area Roadway Operations
- ACRP Report 52, Wayfinding and Signing Guidelines for Airport Terminals and Landside
- ACRP Report 55, Passenger Level of Service and Spatial Planning for Airport Terminals
- ACRP Report 69, Asset and Infrastructure Management for Airports
- ACRP Report 70, Guidebook for Implementing Intelligent Transportation System Elements to Improve Airport Traveler Access Information
- ACRP Report 77, Guidebook for Developing General Aviation Airport Business Plans
- ACRP Report 79, Evaluating Airfield Capacity
- ACRP Report 80, Guidebook for Incorporating Sustainability into Traditional Airport Projects
- ACRP Report 82, Preparing Peak Period and Operational Profiles—Guidebook
- ACRP Report 94, Integrating Web-Based Emergency Management Collaboration Software into Airport Operations
- ACRP Report 96, Apron Planning and Design Guidebook
- ACRP Report 104, Defining and Measuring Aircraft Delay and Airport Capacity Thresholds
- ACRP Report 108, Guidebook for Energy Facilities Compatibility with Airports and Airspace.
- ACRP Report 109, Improving Terminal Design to Increase Revenue Generation Related to Customer Satisfaction
- ACRP Report 113, Guidebook on General Aviation Facility Planning
- ACRP Report 114, Guidebook for Through-the-Fence Operations
- ACRP Report 119, Prototype Airport Sustainability Rating System—

Characteristics, Viability, and Implementation Options

- ACRP Report 121, Innovative Revenue Strategies – An Airport Guide
- ACRP Report 129, Evaluating Methods for Counting Aircraft Operations at Non-Towered Airports
- ACRP Report 140, Guidebook on Best Practices for Airport Cybersecurity.
- ACRP Report 141, Renewable Energy as an Airport Revenue Source
- ACRP Report 143, Guidebook for Air Cargo Facility Planning and Development
- ACRP Report 144, Unmanned Aircraft Systems (UAS) at Airports: A Primer
- ACRP Report 146, Commercial Ground Transportation at Airports: Best Practices
- ACRP Report 150, NextGen for Airports

### STANDARD OPERATING PROCEDURES (SOP)

[www.faa.gov/airports/resources/sops/](http://www.faa.gov/airports/resources/sops/)

- Standard Operating Procedure (SOP) 2.00, Standard Procedure for FAA Review and Approval of Airport Layout Plans (ALPs)
- Standard Operating Procedure (SOP) 3.00, FAA Review of Exhibit 'A' Airport Property Inventory Maps
- Standard Operating Procedure (SOP) 5.1, Standard Operating Procedure for CATEX Determinations
- Standard Operating Procedure (SOP) 8.00 Standard Operating Procedure for Runway Safety Area Determination
- Standard Operating Procedure (SOP) 9.1 FAA Aeronautical Study, Coordination and Evaluation

### CODE OF FEDERAL REGULATIONS (CFR)

[www.faa.gov/regulations\\_policies/faq\\_regulations/](http://www.faa.gov/regulations_policies/faq_regulations/)

- 14 CFR Part 77, Safe, Efficient Use, and Preservation of the Navigable Airspace
- 14 CFR Part 139, Certification of Airports
- 14 CFR Part 158, Passenger Facility Charges
- 49 CFR Part 1540, Civil Aviation Security: General Rules
- 49 CFR Part 1542, Airport Security

### FAA ORDERS & NOTICES

[www.faa.gov/regulations\\_policies/orders\\_notices/](http://www.faa.gov/regulations_policies/orders_notices/)

- FAA Order 1050.1F, Environmental Impacts: Policies and Procedures
- FAA Order 1050.4C, Mike Monroney Aeronautical Center Spill Prevention, Control and Countermeasures Plan
- FAA Order 5050.4B, National Environmental Policy Act (NEPA) Implementing Instructions for Airport Actions
- FAA Order 5190.3C, Field Formulation of the National Plan of Integrated Airport Systems (NPIAS)
- FAA Order 5100.38D, Airport Improvement Program Handbook
- FAA Order 5100.39A, Airports Capital Improvement Plan
- FAA Order 5500.1, Passenger Facility Charge
- FAA Order 6480.4A, Airport Traffic Control Tower Siting Criteria
- FAA Order 8260.3D, The United States Standard for Terminal Instruments Procedures (TERPS)

## ADDITIONAL FAA RESOURCES

- FAA's Runway Simulator  
[www.faa.gov/airports/planning\\_capacity/runwaysimulator/](http://www.faa.gov/airports/planning_capacity/runwaysimulator/)
- Recycling, Reuse, and Waste Reduction at Airports: A Synthesis Document  
[www.faa.gov/airports/resources/publications/reports/environmental/media/RecyclingSynthesis2013.pdf](http://www.faa.gov/airports/resources/publications/reports/environmental/media/RecyclingSynthesis2013.pdf)
- NPIAS Airports  
[www.faa.gov/airports/planning\\_capacity/npias/](http://www.faa.gov/airports/planning_capacity/npias/)
- FAA Terminal Area Forecast (TAF)  
<https://aspm.faa.gov/main/taf.asp>
- FAA Operations and Performance Data  
<https://aspm.faa.gov/>
- FAA Aerospace Forecast Fiscal Years 2018-2038  
[www.faa.gov/data\\_research/aviation/](http://www.faa.gov/data_research/aviation/)
- Forecasting Aviation Activity by Airport  
[www.faa.gov/data\\_research/aviation\\_data\\_statistics/](http://www.faa.gov/data_research/aviation_data_statistics/)
- Aviation Block Grant Program  
[www.faa.gov/airports/aip/grant\\_assurances/](http://www.faa.gov/airports/aip/grant_assurances/)
- Airport Sponsors  
[www.faa.gov/airports/aip/grant\\_assurances/](http://www.faa.gov/airports/aip/grant_assurances/)
- Non-Airport Sponsors Undertaking Noise Compatibility Program Projects  
[www.faa.gov/airports/aip/grant\\_assurances/](http://www.faa.gov/airports/aip/grant_assurances/)
- Planning Agency Sponsors  
[www.faa.gov/airports/aip/grant\\_assurances/](http://www.faa.gov/airports/aip/grant_assurances/)
- Sustainability Pilot Program  
[www.faa.gov/airports/environmental/sustainability/](http://www.faa.gov/airports/environmental/sustainability/)
- Aviation System Performance Metrics (ASPM) Data Systems  
<https://aspm.faa.gov/>
- FAA Recycling, Reuse, and Waste Reduction at Airports: A Synthesis Document  
[www.faa.gov/airports/resources/publications/reports/environmental/media/RecyclingSynthesis2013.pdf](http://www.faa.gov/airports/resources/publications/reports/environmental/media/RecyclingSynthesis2013.pdf)
- FAA Passenger Facility Charge (PFC) Program  
[www.faa.gov/airports/pfc/](http://www.faa.gov/airports/pfc/)

## STATE RESOURCES

- Title XXV, Aviation, Florida Statutes (F.S.)  
[www.leg.state.fl.us/STATUTES/](http://www.leg.state.fl.us/STATUTES/)
- Rule 14-60, Airport Licensing, Registration, and Airspace Protection, Florida Administrative Code (FAC)  
[www.flrules.org/gateway/ChapterHome.asp?Chapter=14-60](http://www.flrules.org/gateway/ChapterHome.asp?Chapter=14-60)
- FDOT's Florida Aviation System Plan (FASP)  
[www.fdot.gov/aviation/FASP2035.shtm](http://www.fdot.gov/aviation/FASP2035.shtm)
- FDOT Aviation Procedures and Forms
- Topic No: 725-040-040 - Aviation Program Management
- Topic No: 725-040-100 - Airport Master Plans
- Topic No: 725-000-005 - Public Transportation Joint Partnership Agreement
- Form No: 725-040-15 - Exhibit 'C' Aviation Program Assurances  
[www.fdot.gov/proceduraldocuments/](http://www.fdot.gov/proceduraldocuments/)
- Pavement Management: Airfield Pavement Distress Repair Manual  
[www.fdot.gov/aviation/pavement.shtm](http://www.fdot.gov/aviation/pavement.shtm)
- Airfield Pavement Inspection Reference Manual  
[www.fdot.gov/aviation/pavement.shtm](http://www.fdot.gov/aviation/pavement.shtm)
- Inspection Methodology for Whitetopping  
[www.fdot.gov/aviation/pavement.shtm](http://www.fdot.gov/aviation/pavement.shtm)
- FDOT Data and Forecasts  
<http://www.fdot.gov/aviation/planning.shtm>
- The Continuing Florida Aviation System Planning Process (CFASPP)  
[www.cfaspp.com/](http://www.cfaspp.com/)
- FDOT Project Development and Environment (PD&E) Manual - Non-Federal Projects  
<http://www.fdot.gov/environment/pubs/pdeman/pdeman1.shtm>

## OTHER RESOURCES

- 5010-1 Airport Master Record  
[www.gcr1.com/5010web/default.cfm](http://www.gcr1.com/5010web/default.cfm)

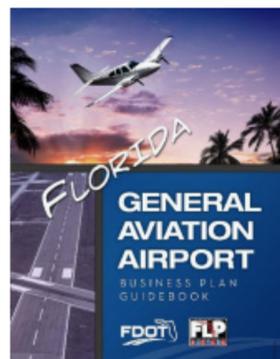


### Strategic Plans

Airport strategic planning provides a long-term framework that guides an airport towards achieving its future goals. As stated in Transportation Research Board's (TRB) Airport Cooperative Research Program (ACRP) Report 20, Strategic Planning in the Airport Industry, "In the case of either a single airport or a multiple-airport system, strategic planning for airports projects a future vision for the airport organization, determines strategies and objectives for the growth or prosperity of the organization (including the type of products and services it should provide), and defines how the vision and objectives can be accomplished." A strategic plan's broad scope allows it to analyze an airport in a more comprehensive manner as well as build consensus on key issues prior to beginning the Master Plan process. At its core, master planning is fully dependent on having a well-developed strategic plan as it relies on that process to define the airport's vision, the customer base, and services to be provided. The primary Master Plan deliverable, the ALP, is intended to provide a development plan that fulfills these identified goals.

### Business Plans

An airport business plan lays out the goals and objectives of the airport sponsor that are not directly related to facility requirements as in the Master Plan, but can inform facility-related needs. At its most basic form, a business plan is a document that helps airports become financially self-sufficient. It is not the intention of a business plan to condense the long-range planning effort into one year; rather, the business plan seeks to achieve these goals by outlining incremental short-term actions that help to achieve the long-term goals. Another typical output of a business plan is the economic impact of the airport, which may be used as a promotional tool to illustrate the value of the airport.



FDOT GA Business Plan

In Florida, sometimes a business plan component may be added as a section of a Master Plan or Master Plan Update. If conditions warrant it, a business plan may be completed as a stand-alone document, but would not be eligible for Federal funding. If completed as a stand-alone document, integration of any previous or ongoing business planning initiatives must be appropriately incorporated into a Master Plan.

### Marketing Plans/Analysis

Marketing plans are developed by airports as a way to promote the facilities and services that are available at an airport. The form of the plan depends on the size and role of an airport. For large commercial service airports, a marketing plan seeks to inform potential passengers of new destinations, passenger amenities, or ease of access. A GA airport may promote fuel available for sale, available hangars, or the presence of a control tower. Marketing plans are not considered part of a Master Plan process, but rather used to promote the vision of the airport as described in the Airport Master Plan and formulated in the Business Plan.

### Compatible Land-Use Plans

Land-use planning can encompass both on- and off-airport applications. While on-airport land-use planning is typically addressed within the context of an Airport Master Plan, off-airport land-use planning has become a critical component of an airport's long-term growth and sustainability strategy.

Increasingly, off-airport development has had significant impacts on the operational and development capacities of airports, directly affecting on-airport development plans and initiatives. FDOT developed the Airport Compatible Land Use Guidebook to assist airports and their local municipalities in understanding the regulations and limitations of land use planning in Florida. This resource is available for download at: [www.fdot.gov/aviation/flpub.shtm](http://www.fdot.gov/aviation/flpub.shtm)

Generally, it is incumbent upon the airport to work to maximize the compatibility between its operations and the surrounding uses and activities, including minimization of potential noise impacts and environmental conflicts and establishment of appropriate zoning, overlay districts, and regulations. However, by its very nature, off-airport planning must be accomplished through extensive coordination with local, regional, and state governments, planning agencies, the local populace, and other interested stakeholders. Consequently, integration of any land-use planning initiatives, both on- and off-airport, should be pursued to help ensure the viability of the overall airport master planning effort. Additionally, future land use plans or updates should review the recommended development plan of the Master Plan to ensure continuing compatibility.

Airport Master Plans may include planning elements which are inconsistent with the local government comprehensive plan. However, the CIP outlined in the Airport Master Plan should be consistent with the local government comprehensive plan and must be consistent with the Florida Aviation System Plan. Projects in the CIP which are inconsistent with the local government comprehensive plan must be adequately addressed in the narrative portion of the Airport Master Plan and will not be eligible for FDOT funding.

Aviation related projects in an approved Master Plan that has been integrated into the local comprehensive plan are exempt from the Development of Regional Impact (DRI) review process, per Chapter 163 and 380 of the Florida Statutes.

As a means of furthering planning integration, it is strongly suggested that cities and counties address protection of existing and planned airport improvements in the future land use, transportation, intergovernmental coordination and capital improvement program elements of their local government comprehensive plan. It should be noted that the Airport Master Plan is an excellent source of information for these elements, and that much of the data required for the airport-related elements of the comprehensive plan may be taken directly from an Airport Master Plan. As a final means of suggested planning integration, airport sponsors can elect to officially incorporate their Airport Master Plans into their local governmental comprehensive plan. In such an instance, aviation related developments that have been addressed within the approved Airport Master Plan would be exempt from the Development of Regional Impact (DRI) review process outlined in Chapter 163 and 380 of the Florida Statutes.

### Florida Specific Information!



Chapter 163, F.S. requires the future land use element to include surveys, studies and data that address the compatibility of uses on lands adjacent to an airport as defined in Ch. 330, F.S. and consistent with Ch. 333, F.S. Additionally, Ch. 163, F.S. requires that the future land use element include criteria to be used to achieve compatibility of lands adjacent to an airport as defined in Ch. 330, F.S. and consistent with Ch. 333.02, F.S. "and consistent with Ch. 333.02, F.S."

### Sustainability Plans

In recent years, the FAA and FDOT have promoted airport sustainability projects to help promote and preserve airports. The FAA has provided support to airports around the United States through the Airport Sustainable Master Plan Pilot Program. This program was developed to assist airports in developing both Airport Sustainability Plans and Sustainability Master Plans.

While both documents achieve a similar objective, a Sustainability Master Plan fully integrates sustainability into an airport's long-range plan while an Airport Sustainability Plan is a stand-alone document.

Both plans use baseline assessments of environmental resources and community outreach to identify sustainability objectives that can reduce environmental impacts, realize economic benefits, and improve community relations.

### Asset Management

Currently, there is no single standard in to guide the implementation and application of asset management. An internationally recognized documented approach for infrastructure asset management called Publicly Available Specification (PAS) 55 2008, defines asset management as:

"Systematic and coordinated activities and practices through which an organization optimally and sustainably manages its assets and asset systems, their associated performance, risks and expenditures over their lifecycles for the purposes of achieving its organizational strategic plan."

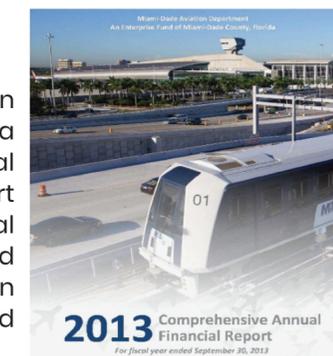
To support NextGen, the FAA now recommends airports utilize GIS when developing and maintaining ALPs. Airport GIS directly benefits the asset management effort by providing the infrastructure and operational data in a streamlined collection effort. Computer models such as Building Information Modeling (BIM) uses 3D models to capture, explore, and maintain consistent and coordinated planning, design, construction, and operational data. This allows the sponsor to have a greater insight into the project needs and constraints that may impact the cost and schedule. By providing this digital data to planners and engineers, sponsors can ensure everyone is utilizing the same data source. Additionally, the BIM systems would allow designers to "visualize" the project within the existing airport infrastructure to better ensure constructibility.

Examples of utilizing asset management in real time at an airport would be noticing that a certain section of lighting has an underlying issue based on the number of work orders being placed or having road signs automatically direct passengers to a different parking lot at 9:00 AM when it is known that lot is typically full by 9:30 AM. By building a model that allow this type of consistent tracking the airport can better identify issues and opportunities that can be reviewed as part of the Master Planning effort.

*ACRP Report 69, Asset and Infrastructure Management for Airports* provides more information on asset management.

### Financial Plans

Financial planning within the airport spectrum can encompass a wide array of analyses, ranging from a proposed project's cost-benefit analysis to the financial sustainability and economic impact of an entire airport system. Regardless of their size and focus, financial plans all recognize the importance of appropriate and responsible planning with respect to funding, return on investment, and whether or not an investment is justified by the result.



Additionally, financial plans can include efforts to establish or update airport rates, minimum standards, or leasing terms. Such plans may also involve concessions, properties, and financing large capital projects. Each of these revenue streams could have significant impact on an airport operation due to their potential to influence that airport's operations, capital development, and ultimately its balance sheet.

As noted above, a primary element of all airport master planning efforts is conducting a financial analysis to identify funding sources for proposed projects.

Direct integration of this Master Plan element with any other relevant financial plans is essential to ensure that the results of the Master Plan are financially feasible.

### Terminal Area Plans

The terminal area is the interface between landside and airside operations for aircraft passengers. While the basics of the terminal area are addressed in the Master Plan, a Terminal Area Plan provides more in-depth analysis of the accessibility, passenger convenience, operating efficiency, facility investment, and aesthetics of the terminal area. Considering the range and extent of planning considerations that can be included within a Terminal Area Plan, its results would have a significant impact on any associated airport development and financial plans. These plans are typically developed for commercial service airports.

### Access Plans

While it may be included in a terminal area plan, a standalone airport ground access plan can include any element that an aircraft passenger and/or cargo shipment could encounter while traveling to and from the local and regional transportation infrastructure network. These plans are typically developed for commercial service airports. All modes of transportation should be considered including roadways, highways, railways, taxis, limousines, buses, ride sharing, rapid transit, waterborne modes, and helicopter links. It should also be noted that since much of the transportation elements addressed within an airport access plan typically lie outside of the airport itself, access plans are often more general and strategic in nature. This is largely due to the potential coordination efforts required with local and regional transportation agencies, highway departments, transit authorities, and comprehensive planning bodies.

Regardless of their general nature, airport access plans can have an immediate and significant impact on the Master Plan process given that the landside capacity of the airport could be a limiting factor for airport development. As such, airport access plans must be integrated appropriately with any master planning effort.

### System Plans

An airport system plan is a representation of the aviation facilities and service required to meet the needs of a metropolitan area, region, state or country. Generally, the overall purpose of a system plan is to determine appropriate airport development needed to establish a viable and integrated system of airports. FDOT has developed the Florida Aviation System Plan (FASP) to serve as its statewide system planning document, which is administered through the Continuing Florida Aviation System Planning Process (CFASPP). The FASP identifies future development needs by region, new trends, performance measures, and forecast input data that should be considered in the Airport Master Plan. Development proposed in an airport master plan must be consistent with the FASP role for that airport. The FASP is currently being updated to include the newest thinking in system planning and will provide airports with a wealth of knowledge on their airport's role in the overall system

#### Florida Specific Information!



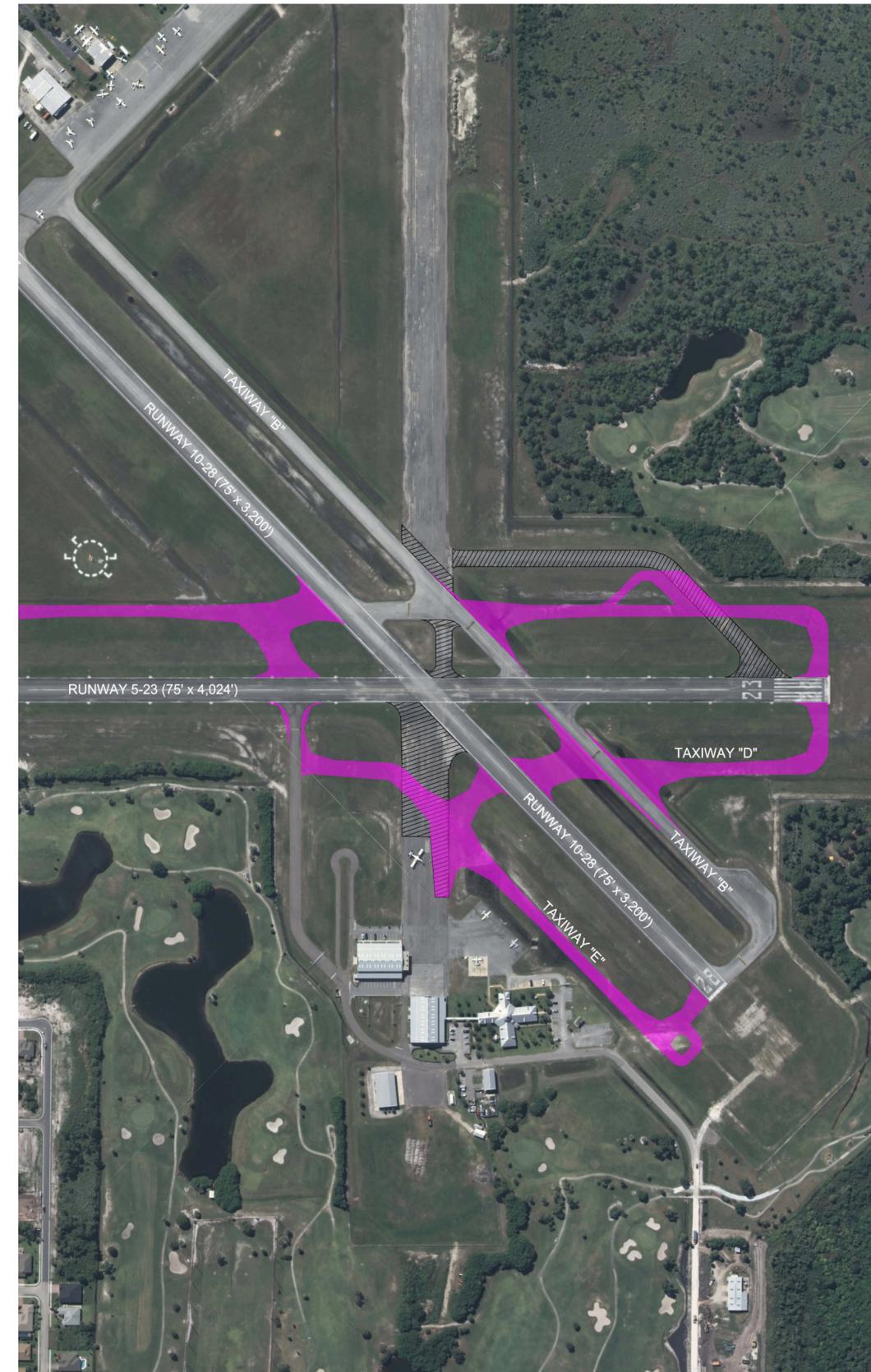
The FASP identifies future development needs by region, new trends, performance measures, and forecast input data that should be considered in the Airport Master Plan. Development proposed in an airport master plan must be consistent with the FASP role for that airport.

### Additional Planning Efforts

In addition to the plans referenced above, Master Plans are encouraged to make use of any additional studies or plans that may have pertinent information related to the airport and its future needs. Collecting previously gathered information from other planning efforts helps reduce effort and save time devoted to the Airport Master Plan. Some other examples of plans or studies that may have an effect on the Master Plan process can be seen below:

- Environmental Impact Studies
- Project Feasibility Studies
- Land Acquisition Studies
- Wildlife Hazard Studies
- Site Selection Studies
- Stormwater and Drainage Plans
- Pavement Maintenance Management Plans
- Municipal Codes, Ordinances, and Zoning Regulations

This list of plans and studies is not all inclusive; other documents may also affect the master planning process and should be explored as applicable.



### FEDERAL MASTER PLAN GUIDANCE

#### AC 150/5070-6B (Series) – Airport Master Plans

##### What is it?

The Airport Master Plans AC is the primary Federal resource for the preparation and development of all Airport Master Plans. This resource document includes details on the entire master planning effort, from inception to final approval, and allows for airports completing a Master Plan to select specific elements that are applicable to their airport. Currently, this AC is in version Change 2, dated January 27, 2015. When developing a Master Plan, the most up to date version of this AC should be used. Consultants must determine the most up to date version and be aware of any draft changes that are likely to occur during the master planning process.

##### What is it for?

This document was developed to provide flexible guidance throughout the master planning process while still focusing on the critical issues that all Master Plans need to address for FAA approval. Every Florida airport has their own set of goals for their master planning process. However, this AC provides the framework for an airport of any size to tailor their Airport Master Plan to the distinctive conditions that are present at their airport while remaining compliant with FAA requirements.

##### Why is it important?

This document provides information on all elements of a Master Plan, including aviation forecasts and ALPs. It is imperative that all airports completing a Master Plan review this to ensure consideration of all elements and suggestions prescribed by the FAA. Depending on the type and scope of a Master Plan (ex: standard update or initial, “from scratch” Master Plan), not all sections may be pertinent to every airport. Each airport should determine which sections of the AC and the level of analysis needed to support their master planning efforts.

This AC also includes several supplemental appendices such as:

- Useful Reference Materials
- Suggested Potential Stakeholders
- Consideration of Environmental Factors in Airport Master Planning
- Guidance on preparing an Airport Layout Plan Drawing Set
- Standard Operating Procedures (SOPs) for the development of the ALP

#### AC 150/5300-13 (Series) – Airport Design

##### What is it?

The Airport Design AC contains airport design standards and recommendations as formulated by the FAA for use in the design of airports. These standards are a critical and necessary component in the master planning process; it is imperative that the entity completing a Master Plan understands the facility needs and the appropriate standards for design. Additionally, the standards contained in this AC are mandatory for all federally-obligated airports and should be referenced throughout the project to understand the implications of proposed design elements. This document is updated frequently; therefore, it is important to confirm that the most recent version is used. Currently, this AC is in version Change 1, dated February 26, 2014.

##### What is it for?

This AC provides details on the standards for developing facilities on an airport. This includes standards for runway design, taxiway design, and the geometry of an airport.

This document provides recommended design standards based on the type of aircraft currently operating and projected to operate at the airport. This AC is also the key design source for the ALP and the standards contained within it are used by the FAA to determine compliance.

##### Why is it important?

Airport projects receiving Federal grant assistance through the AIP are required to comply with the design standards outlined in the AC. Additionally, at Part 139 certificated airports, the standards and recommendations are used to satisfy specific requirements of the Code of Federal Regulations (CFR). It is recommended that, to the extent feasible, development proposed as part of a Master Plan be in accordance with this AC to facilitate and maximize funding options for the airport.

#### AC 150/5060-5 (Series) – Airport Capacity and Delay

##### What is it?

The Airport Capacity and Delay AC is a comprehensive resource on determining airport capacity and aircraft delay for airport planning and design. The most current version of this AC incorporates Changes 1 and 2, dated September 23, 1983.

##### What is it for?

This AC explains how to estimate airport capacity and aircraft delays for airport planning and design. Hourly airport capacities and annual aircraft delay computations are needed to design and evaluate airport development and improvement projects. Airport sponsors should be familiar with demand, delay, and capacity as changes can greatly impact airport operations. Since delay, demand, and capacity are vital to airport operations, proposed operational and facility improvements justified through the master planning process will support demand, reduce aircraft delays and increase airport capacity throughput.

##### Why is it important?

This AC provides detailed guidance on the calculation process and the resulting impact on delay. It also is directly tied to aviation forecasts. Since these computations can change due to variations in runway use, aircraft mix, and air traffic control (ATC) rules, more than one calculation may be needed to estimate existing and future capacity.

#### FAA Standard Operating Procedures (SOPs)

The FAA has recently developed SOPs to standardize activities, create efficiency, increase quality control, and ensure consistency in program administration across all FAA regions. A total of eleven (11) SOPs have been developed to date. While all of the SOPs apply to airports, there are three that are pertinent to the master planning process:

- SOP Number 2.00: Standard Operating Procedure for FAA Review and Approval of Airport Layout Plans (ALPs)
- SOP Number 3.00: Standard Operating Procedure for FAA Review of Exhibit ‘A’ Airport Property Inventory Maps
- SOP Number 8.00: Standard Operating Procedure for Runway Safety Area Determination

These SOPs are explained in detail below. It should be noted that the FAA is developing additional SOPs for a variety of different topics. For more information on any of the SOPs, and to ensure that the current version is used, visit: [www.faa.gov/airports/resources/sops/](http://www.faa.gov/airports/resources/sops/)

#### SOP Number 2.00 – Standard Operating Procedure for FAA Review and Approval of Airport Layout Plans

##### What is it?

SOP Number 2.00, issued October 1, 2013, contains standardized information that provides uniform procedures for the FAA’s review and approval of ALP sets. The ALP drawings in a set graphically illustrate the existing and future airport facilities and consist of: cover sheet, Airport Layout Plan drawing, data sheet, facilities layout plan, as well as other drawings and exhibit documents.

##### What is it for?

This SOP is limited to providing information on the standardized ALP set review and approval processes and is not meant to provide step-by-step instructions on developing an ALP. This SOP should be used as a guide to ensure that items reviewed by the FAA are addressed in an airport’s ALP set. This SOP is used by the FAA to ensure that ALPs are developed in accordance with current FAA standards.

##### Why is it important?

SOP 2.00 provides an ALP review checklist, standard ALP approval letters, and a general ALP process chart that to be used when developing an ALP set. These resources include an item-by-item checklist of the information that needs to be included in each sheet of an ALP set. Additionally, this SOP should be used during the scoping process to identify what elements will and will not be included in the ALP set. This SOP does not provide information on electronic ALPs or eALPs. Standards for ALP set sheets are also provided in *AC 150/5070-6B, Airport Master Plans*.

#### SOP Number 3.00 – Standard Operating Procedure for FAA Review of Exhibit ‘A’ Airport Property Inventory Maps

##### What is it?

SOP Number 3.00, issued October 1, 2013, establishes uniform procedures for the FAA’s review and acceptance of Exhibit ‘A’ Airport Property Inventory Maps (Exhibit ‘A’). This SOP is limited to the review and acceptance of Exhibit ‘A,’ which is restricted to elements that will assist in the identification of property. To supplement this document, the SOP provides an Exhibit ‘A’ Review Process Chart and Checklist to assist with tracking the completion of an acceptable Exhibit ‘A.’ An Exhibit ‘A’ is typically updated as part of a Master Plan but can also be done on its own, separate from the Master Plan.

##### What is it for?

This SOP provides standards for the maintenance and update of the Exhibit ‘A’ document for airport sponsors. An Exhibit ‘A’ map is used to identify airport property, providing an inventory of all land parcels that make up the airport and a summary of encumbered property, which includes how parcels were acquired, funding source, how land was conveyed, prior property owner, etc. This is different from an airport property map. This SOP is used by the FAA to review and accept Exhibit ‘A’ documents and should be referenced to ensure consistency. Further, this SOP includes information on when to submit documents and provides guidance on the Exhibit ‘A’ review process.

##### Why is it important?

Airports have a Federal obligation to submit accurate Exhibit ‘A’ maps to be eligible for certain Federal grants. Airports also have a duty to obtain FAA consent to delete any land described and shown in the Exhibit ‘A’. To assist airports, SOP 3.00 provides step-by-step instruction on the process. This instruction is provided in the form of an Exhibit ‘A’ Review Process Chart and Exhibit ‘A’ Review Checklist.

Finally, and most important, an updated Exhibit ‘A’ and encumbrance report is required for all Airport Master Plans.

### **SOP Number 8.00 – Standard Operating Procedure for Runway Safety Area Determinations**

#### **What is it?**

SOP Number 8.00 provides a uniform procedure for documenting Runway Safety Area Determinations (RSADs). The SOP also assists the FAA in determining when to assess or reassess the Runway Safety Area (RSA).

#### **What is it for?**

This SOP identifies procedures for writing or amending RSADs and supporting documents, as required by specific FAA orders. The FAA uses this SOP as reference when reviewing existing or proposed RSADs and when conducting supporting studies for all federally obligated airports, including airports in block grant states.

#### **Why is it important?**

This SOP also describes triggering actions that may require updated or new RSADs along with the determination categories used by the FAA. Though discussed later in this Guidebook, revisions to Master Plans or ALPs may trigger a RSAD. So, it is important to understand these triggering events when developing Master Plans. The SOP also provides an excellent process flow chart used in identifying appropriate actions and types of documentation necessary to support the existing or expected RSAD. Note that Modifications of Standard (MOS) do not apply to RSAs.

### **FAA Order 5100.38D – Airport Improvement Program Handbook**

#### **What is it?**

The AIP Handbook, issued September 30, 2014, provides guidance on the administration and eligibility requirements of the AIP. As defined in Federal statute, the AIP “provides grants to public agencies for the planning and development of public-use airports that are included in the National Plan of Integrated Airport Systems (NPIAS).” The Handbook includes information on the overall grant process, eligible grant recipients, and projects eligible for grants under the AIP.

#### **What is it for?**

The AIP Handbook provides guidance, policy, and procedures for the administration of the AIP and AIP funding. The purpose of the guidebook is to assist airports and the agencies to determine AIP funding eligibility for proposed projects. AIP-eligible projects include airport planning, airport development, noise compatibility planning, and noise compatibility projects at AIP-eligible airports, seaplane bases, and heliports.

#### **Why is it important?**

Use of the AIP Handbook is mandatory as it is the published policy for AIP, as codified under 49 USC. Additionally, the statute does not provide the authority to fund an action or an item that cannot be funded under AIP.

Thus, prior to beginning a Master Plan or ALP Update project, this document should be reviewed as part of the initial scope development process to ensure compliance and understanding of eligibility requirements.

### **Code of Federal Regulations, Part 77 – Safe, Efficient Use, and Preservation of Navigable Airspace**

#### **What is it?**

14 CFR Part 77 is a Federal aviation regulation that establishes standards and notification requirements for obstructions affecting air navigation. This regulation defines three-dimensional imaginary surfaces and critical areas around public-use airports and military airfields that require protection from tall structures, both manmade and natural, that may pose a hazard to safe airport operations and/or navigable airspace. Part 77 also provides guidance related to activities within the airport and airspace that could compromise safe operations.

#### **What is it for?**

Part 77 identifies an airport’s “imaginary surfaces” which include both height and distance requirements associated with a runway which must remain clear to support safe operations. Part 77 also identifies Federal obstruction standards associated with structures, trees and other potential hazards that may impact airport operations.

#### **Why is it important?**

Compliance with Part 77 is required by Federal law. Airports sometimes run into issues where an existing or proposed obstruction located outside of the airport property may impact safe operations. However, Part 77 applies to all obstructions regardless of its location. Additionally, compliance with Part 77 surfaces and obstruction standards is also required as part of Chapter 333. Thus, any activity or development that is proposed as part of a Master Plan must be evaluated in accordance with Part 77 standards. Additionally, a Part 77 drawing is required as part of the ALP set.

### **FAA Forecasting Aviation Activity by Airport**

#### **What is it?**

This document details the aviation forecasting process with step-by-step instructions. The FAA developed this report as a guide for preparing and reviewing aviation forecasts. The information provided promotes consistency in the development of aviation forecasts regardless of the airport.

#### **What is it for?**

This document was developed to provide specific instructions on how to develop aviation forecasts, and covers the steps required for developing aviation forecasts that are:

- Realistic
- Based on the latest available data
- Reflect the current conditions at the airport
- Supported by information in the study
- Provide adequate justification for the airport planning and development

Additionally, the document’s appendices provide templates to facilitate the FAA’s forecasting review process.

#### **Why is it important?**

As discussed earlier, forecasts are approved by the FAA as part of any Master Plan process. While the scope of a forecast will be dependent on an airport’s level of activity, any activity that creates a facility need should be justified by the forecast. Using this document helps ensure consistency in forecasts regardless of the airport developing them.

Because this document was developed by the FAA, who is responsible for reviewing forecasts, use of this document can confirm that forecasts are in accordance with current FAA standards, lending to approval of the forecasts which is an FAA requirement of the process.

### **FAA Recycling, Reuse and Waste Reduction at Airports: A Synthesis Document**

#### **What is it?**

The FAA developed this document, effective April 24, 2013, to fulfill legislative requirements related to recycling and waste reduction and as a means to incorporate sustainable practices into airport planning. Sustainable practices at airports benefit airports in a multitude of way, including economically, socially, and environmentally. This document includes guidance on airport recycling, reduction, and waste reuse programs to further waste minimization initiatives.

#### **What is it for?**

This document is a guide for users to increase sustainability in airports by creating programs for recycling, reduction and reuse of materials, and reduction of energy consumption. It also includes lessons-learned and case studies around the country on recycling programs as well as reuse and waste reduction programs.

#### **Why is it important?**

Airport sponsors can use this document when evaluating recycling or waste reduction processes as part of their Airport Master Plan. Consulting this document is important since recycling program evaluation is an FAA Master Plan requirement. Detailed information is included on the steps to design and implement these programs, as well as recommendations on what to consider. For example, steps to establishing a recycling program to divert municipal solid waste (MSW) from airports from landfills are included. There is also guidance on other non-MSW waste streams (how the input of waste flows from generation into full removal).

This document also provides a list of resources, including a tool to establish the programs mentioned above, the EPA’s document ‘Developing and Implementing an Airport Recycling Program’ found here:

<https://nepis.epa.gov/Exe/ZyPDF.cgi/P1005N5Q.PDF?Dockkey=P1005N5Q.PDF>

### **STATE/FDOT GUIDELINES AND GUIDANCE**

#### **Chapter 332, Florida Statutes**

#### **What is it?**

Chapter 332 dictates FDOT’s obligations related to the funding of the Florida airport system to promote and further the development and improvement of airports.

#### **What is it for?**

Chapter 332 outlines FDOT’s duties and responsibilities relating to the aviation system of Florida and all related matters, including the administration and financing of aviation and airport programs and projects. This document also includes restrictions on FDOT’s power. For example, FDOT cannot regulate commercial air carriers.

#### **Why is it important?**

When developing a Master Plan, this statute will help the airport sponsor understand the type and funding assistance that FDOT is authorized to provide for airport projects. This statute also contains information with regard to property acquisition, which should be used as part of the master planning process.

## **FDOT Topic No. 725-040-040-k, Aviation Program Management**

### **What is it?**

This procedure provides guidance on the process and standards for planning, approving, and monitoring FDOT funding for airport projects. This includes the eligibility requirements for receiving funding, funding amounts, as well as management requirements for programmed funds.

### **What is it for?**

This procedure was developed to explicitly describe FDOT's involvement in funding projects at Florida's public-use airports. This includes FDOT's funding allowance for different project types, FDOT's funding share, and coordination with the District Work Program.

### **Why is it important?**

This procedure provides information on state funding eligibility for projects and method and share of the available funding. This procedure will assist airports by helping them understand the steps and requirements needed to be programmed for and receive funding for projects at their airport.

## **FDOT Topic No. 725-040-100-i, Airport Master Plans**

### **What is it?**

This document outlines FDOT's role in the master planning process, including their role in scope development, funding, and final approvals. This document not only defines FDOT's role but also outlines state and Federal requirements with regard to FDOT's participation/involvement and FAA's role within the master planning process. Per FDOT Procedure, this document guides FDOT's participation in the preparation, funding, review, and approval of Airport Master Plans prepared by local airport sponsors. This document can be found at: <https://fdotwp1.dot.state.fl.us/ProceduresInformationManagementSystemInternet/FormsAndProcedures/ViewDocument?topicNum=725-040-100>

### **What is it for?**

This document was developed to clarify FDOT's role in the master planning process, as well as provide coordination guidance with all required entities and agencies. For airports developing a Master Plan, this document is useful in understanding the process and timing of FDOT's and FAA's participation in the planning process.

### **Why is it important?**

This procedure clearly identifies the documentation compliance requirements for Airport Master Plans. These instructions are important as they allow for a more standardized and systematic approach to the preparation, funding, review, and approval of Master Plans. As stated in this procedure, to be eligible for FDOT funding, the airport must have a FDOT approved Master Plan and ALP that has been developed consistent with this procedure.

## **FDOT Form 725-000-01, Public Transportation Grant Agreements**

### **What is it?**

FDOT Public Transportation Grant Agreements (PTGAs) are agreements between an agency and FDOT that establish a public transportation project and responsibilities related to the project. A PTGA defines the scope, budget, funding source and any legal provision necessary for the project. Additionally, Exhibit E of each PTGA contains Aviation Program Assurances that all public-use airports must follow when entering into a PTGA with FDOT.

These assurances delineate the obligations of all parties to confirm their commitment and compliance.

### **What is it for?**

These documents form the basis of the grant agreement, or contract, between the airport sponsor, FDOT, and the State of Florida.

### **Why is it important?**

All of the provisions contained within PTGA and Aviation Program Assurances are required to be followed if FDOT funds are used for any airport project. Non-compliance may absolve FDOT's financial commitment to the airport and could jeopardize future funding. When developing recommendations as part of a Master Plan, the ability to comply with the requirements and assurances should be reviewed so that future funding is not at risk.

## **Florida Aviation System Plan**

### **What is it?**

The Florida Aviation System Plan (FASP) is FDOT's strategic 20-year plan for developing the state's public airports. The FASP incorporates traditional aviation planning techniques that identify future air traffic demands and the facilities required to meet them on a macro, statewide level. It also includes a strategic planning element that allows FDOT to respond to changing aviation and economic trends, including emerging technologies, projected funding shortfalls, and shifting priorities. This document is currently being updated to the FASP 2035.

### **What is it for?**

To accommodate population and development changes in Florida, it is necessary to take a long-term look at the entire aviation system. To accomplish this, the FASP establishes the framework for considering how each individual airport fits into the overall state aviation system. It also investigates issues such as intermodal transportation networking, the economic impact of airports on their local communities and the state, and development of long-range strategies to meet future aviation needs. Additionally, similar to the purpose of a Master Plan, the FASP identifies trends in aviation statewide in hopes to mitigate potential problems and identify potential areas for growth.

### **Why is it important?**

Chapter 332 requires a statewide aviation system plan to be developed and periodically updated which summarizes 5-year, 10-year, and 20-year airport and aviation needs within the state. The statewide aviation system plan shall also "be consistent with the goals of the Florida Transportation Plan." Thus, in order for airport improvements to be eligible for state funding, Airport Master Plans must be consistent with the aviation system role for the airport described in the FASP. So prior to beginning the master planning process, it is recommended that the airport understand its role as it relates to the FASP to ensure that recommendations contained in the Airport Master Plan support the overall goals of the FASP. In addition, the FASP can also be helpful to the airport to better understand how the airport can grow and expand its operation and function within its role in the regional and state aviation system.

## **Chapter 333, Florida Statutes**

### **What is it?**

Chapter 333 was developed to protect the health, safety, and welfare of airports, airspace, people, and contiguous property by preventing the creation or establishment

of hazards that would negatively impact safe airport operations.

This statute aims to protect public investment in aviation facilities and promote the sustainability of airports as transportation resources. Chapter 333 provides municipalities within an airport hazard area the power to administer and enforce airport zoning regulations, and establishes minimum zoning ordinance requirements.

### **What is it for?**

In accordance with Chapter 333, local governments and political subdivisions are authorized and obligated to adopt, administer, and enforce airport zoning regulations for airport hazard areas.

### **Why is it important?**

"it is hereby found that an airport hazard endangers the lives and property of users of the airport and of occupants of land in its vicinity and also, if of the obstruction type, in effect reduces the size of the area available for the taking off, maneuvering, or landing of aircraft, thus tending to destroy or impair the utility of the airport and the public investment therein."

Under the provisions of Chapter 333, and in accordance with Title 14 CFR Part 77, changes that alter the character of an airport's operations and which are identified on an ALP approved by the FAA are subject to the same zoning protection as existing facilities. When conducting an Airport Master Plan, an analysis of existing incompatible land uses must occur as such uses may result in negative impacts for both the airport and for the activities associated with the incompatible use.

As development is recommended or proposed in an Airport Master Plan, it is important to review all proposed development to ensure it is in accordance with Chapter 333 and the local airport zoning regulations.

## **Rule 14-60, Florida Administrative Code**

### **What is it?**

Rule 14-60 of the Florida Administrative Code (F.A.C.), effective October 10, 2004, provides standards for airports, airport markings, and airport lighting, as well as airspace protection with respect to the licensing of Florida airports. Rule 14-60, F.A.C. was developed to ensure safe airport operation and promote aviation safety by providing airspace protection in accordance with Chapter 333.

### **What is it for?**

Rule 14-60 F.A.C. provides both the licensing standards and minimum standards that all airports licensed by the state of Florida must comply with.

### **Why is it important?**

Rule 14-60 F.A.C. is supported by Chapter 330. This statute governs the licensing of airports in Florida. Thus, when developing an Airport Master Plan, special consideration must be given to ensure that the development recommendations are in accordance with Rule 14-60, F.A.C. It is also recommended that those developing a Master Plan understand the allowed development limits for variances or permits so that resources are not spent developing recommendations that are infeasible. Because development at an airport will be depicted in the Airport Master Plan and ALP, 14-60 F.A.C. should be reviewed to ensure that proposed developments are in compliance with the prescribed standards.

## Chapter 163, Florida Statutes

### What is it?

Chapter 163 requires all counties and municipalities in Florida to adopt a local government comprehensive plan (LGCP). This chapter also addresses the relationship between LGCPs and Airport Master Plans.

### What is it for?

Chapter 163, as it relates to airports and Airport Master Plans, primarily requires the coordination and integration of airport facilities and planning efforts with the planning efforts (LGCPs) of the local municipality. LGCPs provide a top-level view of the entire municipality, including transportation, land use, and intergovernmental coordination. In most instances, Airport Master Plans are incorporated into the LGCP as the aviation component. Because of this, there are requirements for the development of an Airport Master Plan to ensure compatibility with the LGCP.

### Why is it important?

Components of Chapter 163 have direct effects on airport planning and development, of which, compliance is mandated by law. Within Chapter 163, it requires that the Local government future land use plan element “shall include criteria to be used to ensure the compatibility of uses on lands adjacent to an airport as defined in Chapter 330 and consistent with Chapter 333.” Additionally, Local governments located within an area designated as a Metropolitan Planning Organization (MPO) shall also address airports, projected airport and aviation development, and land use compatibility around airports as defined by statute.

Also, an Airport Master Plan and any subsequent amendments to the plan prepared for a publicly owned, operated, and licensed airport in accordance with Chapter 333 may be incorporated into the LGCP. Thus, when developing an Airport Master Plan, the existing LGCP must be reviewed to ensure that all proposed development is in accordance with its provisions. It is recommended that the entity completing the Airport Master Plan meet with local officials to review proposed development and recommendations to ensure that consistency with the LGCP.

## Additional FAA Guidance And Regulation

In addition to the primary FAA resource documents, the following ACs are also recommended to be reviewed based on the scope of a Master Plan. Following this section, Table 3 provides a summary of the additional Federal Master Plan Guidance as well as suggestions on the individual sections of a Master Plan where the guidance should be utilized. The most current version of all FAA ACs that are referenced below can be accessed at: [https://www.faa.gov/regulations\\_policies/advisory\\_circulars/](https://www.faa.gov/regulations_policies/advisory_circulars/)

### FAA AC 150/5070-7 – The Airport System Planning Process (Dated: January 16, 2015)

This AC provides guidance on the development of an airport system plan. System plans are developed to preserve and enhance an airport system to meet current and future demand. Rather than define specifics of how a system plan must be developed, this AC was developed to provide flexible recommendations on how to develop a system plan.

### FAA AC 150/5100-14E – Architectural, Engineering, and Planning Consultant Services for Airport Grant Projects (Dated: September 30, 2014)

This AC provides guidance for users in selecting consultants for planning, architectural, and engineering consultant services. The AC also provides information on services that would be included in an airport grant project including types of contracts, contract format, and guidelines for determining consultant fees.

This guidance is important since unless an airport projects is fully funded by passenger facility charges (PFC), sponsors are required to follow these regulations when awarding each contract.

### FAA AC 150/5300-16A – General Guidance And Specifications For Aeronautical Surveys: Establishment Of Geodetic Control And Submission To The National Geodetic Survey (Dated: September 15, 2007)

This AC is a tool for engineers and surveyors who have contracted with an airport or aviation agencies that perform aeronautical information surveys. This AC provides information on how to establish geodetic control on or near an airport, how to submit information to the National Geodetic Survey (NGS) and the National Spatial Reference System (NSRS). This AC is not a regulation and therefore not mandatory; however, surveys that are funded with Federal grant assistance are required to use the guidelines in this AC.

### FAA AC 150/5300-17C – Standards For Using Remote Sensing Technologies In Airport Surveys (Dated: September 30, 2011)

This AC provides guidance on the use of remote sensing technologies when collecting and analyzing data related to the physical infrastructure of an airport. This AC should be utilized when remote sensing technology is being used for airport surveying and as a reference on the standards for utilizing remote sensing technology. Use of this AC is not mandatory, but projects funded through the AIP or with PFCs are required to follow its guidance.

### FAA AC 150/5300-18B – General Guidance And Specifications For Submission Of Aeronautical Surveys To Ngs: Field Data Collection And Geographic Information System (GIS) Standards (Dated: February 24, 2014)

This AC provides the requirements for data collection in support of the FAA Airport Surveying – Geographic Information System (GIS) Program. Use of this AC is not mandatory, however, for projects funded under Federal grant assistance programs, these guidelines and specifications are required.

### FAA AC 150/5300-19 – Airport Data and Information Program (Dated: September 30, 2015)

This AC provides general guidance and information for users in data collection, submission, and management of data relating to the physical infrastructure and services of their airport within Airports GIS. This AC also describes the schedule, frequency, and standards for airport inspections. Data collected related to this AC is given to the FAA for their aeronautical information databases. Data collection requirements based on the instrument flight rules approaches associated with an individual airport.

### FAA AC 150/5325-4B – Runway Length Requirements for Airport Design FAA AC 150/5325-4B – Runway Length Requirements for Airport Design (Dated: July 1, 2005)

This AC provides guidelines on lengths for new runways or runway extensions. The standards and guidelines contained in this AC are recommended in the design of civil airports. The use of this AC is mandatory for airport projects receiving Federal funding.

### FAA AC 150/5100-20 – Guidance on the Extraction of Oil and Gas on Federally Obligated Airports

This AC addresses oil and gas development on federally obligated airport land. It describes existing FAA policy, guidance, standards, and obligations, for airport sponsors to apply to proposed on-airport oil and gas development activities (including any drilling that penetrates the property’s surface and subsurface).

This AC applies to airport sponsors with federally obligated airport land that are considering on-airport oil and gas production, particularly with hydraulic fracturing.

### Title IX of the Federal Property and Administrative Services Act of 1949 (The Brooks Act)

This Federal law provides guidance to the Government procurement policy, ensuring that it is economical and efficient. This applies to the FAA and airports since it extends to airport property and airway property (used by the airport as property). It is important for users to be familiar with this since it is also applicable to related functions including contracting, inspection, storage, issue, specifications, and others.

## Security Guidance And Regulation

### Chapter 330, Florida Statutes

This chapter outlines the regulation of aircrafts, pilots, and airports through licensing, zoning, enforcement, and registration approved by FDOT. Site approvals and licensing for an airport are contingent on the airport maintaining a safe and secure property. Based on Chapter 330, FDOT may revoke or refuse to allow a license, renewal, or site approval if a public use GA airport with a runway greater than 4,999 feet lacks an approved security plan. Further, the security plan must conform to Florida Airports Council guidelines and it is required that an airport submit an updated plan once every two years for approval from FDOT. Security plans must also be submitted to the Department of Law Enforcement for use in protecting the critical infrastructure of the state.

### Recommended Security Guidelines for Airport Planning, Design, and Constructions (Dated: July 2017)

This document was developed by the Transportation Security Administration (TSA) in conjunction with other government and aviation/airport professionals. The information provided in this document outlines the standards for the design and implementation of security systems for both landside and airside elements of airports. Five (5) appendices are also included that provide additional tools and resources for assessing and mitigating security threats.

### Title 49 – Code of Federal Regulations, Part 1542 – Airport Security

This document ensures that airports are operating security programs that are in compliance with the TSA. It provides guidance to general requirements of airport security programs, operations, and contingency measures. Compliance to these requirements is mandated for airports regularly serving aircraft and foreign air carrier operations. Title 49 of the Code of Federal Regulations can be found at: [https://www.ecfr.gov/cgi-bin/text-idx?tpl=/ecfrbrowse/Title14/14tab\\_02.tpl](https://www.ecfr.gov/cgi-bin/text-idx?tpl=/ecfrbrowse/Title14/14tab_02.tpl).

### Title 49 – Code of Federal Regulations, Part 1540 – Civil Aviation Security: General Rules

This document provides the Federal regulations that govern persons engaged in aviation related activities. This document relates only to security measures at airports. Specifics of the document include security responsibilities for employees, procedures for a security threat assessment, and submission to screening and inspections. Though this document will not necessarily be used as part of the master planning process, understanding its implications is beneficial. Title 49 of the Code of Federal Regulations can be found at: [www.ecfr.gov](http://www.ecfr.gov).

FDOT Checklist		
Master Plan and Airport Layout Plan (ALP) Approvals		
	Approved by	
Airport Master Plan/Airport Layout Plan Information:	FAA	FDOT
a. What is the date of the last accepted Airport Master Plan?		
b. What is the date of the last approved ALP drawing set?		

Project Justification and Scope Meeting		
	YES	NO
Has a justification and scope meeting been scheduled with the District Office, Aviation Office, the airport sponsor, and the FAA (if applicable)?		
Is the plan the airport sponsor is pursuing compatible with the FASP role for the airport?		
Are any additional studies needed to support the goals and objectives of the proposed master plan?		
Were SOP 2.00 and 3.00 (if applicable) used to scope the ALP?		
Have the contents of the proposed ALP been reviewed and agreed upon by the airport sponsor, FDOT, and the FAA (if applicable)?		
Are the five (5) sheets shown below specifically identified in the ALP scope?		
1. A separate Airport Data sheet.		
2. A separate Existing ALP drawing sheet.		
3. A separate Future ALP drawing sheet.		
4. A separate Ultimate ALP drawing sheet (if different from the future sheet).		
5. A separate sheet(s), similar in scale and layout to the ALP Drawing Sheet, showing existing, future, and ultimate 14 CFR Part 77 surfaces only.		

FDOT Scope Review and Approval		
	YES	NO
Have the following items been completed and delivered to the FDOT District Office?		
Note: These items must be completed and delivered prior to FDOT issuing a planning grant.		
1. Type of study		
2. Statement of project needs, goals and objectives, and identified special issues		
3. Proposed scope of work		
4. A copy of the completed FAA ARP SOP 2.00 (include ARP SOP 3.00 if applicable)		
5. Project schedule		
6. Cost estimates and requested state funds		
Has the proposed final scope of work and cost estimate been forwarded to the FDOT Aviation Office for review?		
Has the final scope of work and cost estimate been approved by the FDOT Aviation Office?		
Does the scope of work for the project define specific deliverable products for each element along with a schedule for delivering the products?		
Has the final scope of work and cost estimate been approved by the FAA ADO?		
Does the scope of services include the following statement?  <i>“Invoices will be paid based on the deliverables received by the Department. Invoices should be submitted for payment only after the deliverables have been reviewed and accepted by the Airport Sponsor, the FDOT District Office, FDOT Aviation Office, and, if required, the FAA ADO.”</i>		

Review and Approval of Draft Deliverables		
	YES	NO
Has a copy of the draft deliverables been sent to the FAA ADO, FDOT District Office, and Aviation Office for review and comment?		
Are the draft deliverables consistent with FAA and state standards/guidelines and compatible with the FASP?		
Have there been any significant deviations from the schedule or the project deliverables requiring discussion with the airport sponsor?		
Have District Office comments been consolidated with the Aviation Office's comments and submitted to the airport sponsor?		
Have draft deliverables been accepted by the Airport Sponsor, FDOT District Office and Aviation Office?		

Final Project Reviews			
	YES	NO	
Have one copy of all computer files and two copies of the final draft narrative and ALP been submitted to the FDOT District Office for review?			
Has a copy of the final draft narrative and ALP, including all computer files, been sent to the Aviation Office for review?			
Has the District Office compared the final deliverables to the scope of work to ensure that all items in the scope have been addressed?			
Has the Aviation Office ensured that the final draft narrative and ALP meet FAA and FDOT standards and guidelines and are also consistent with the FASP?			
Have comments been sent to the airport sponsor?			
Has the below disclaimer been added to each of the ALP sheets? <i>“The proposed development depicted in this plan does not inherently represent the official views and policies of FDOT. Conditional approval of this plan does not constitute a commitment on the part of FDOT to participate in the funding of any development depicted in the plan or any project listed within the Capital Improvement Plan (CIP) element, nor does it indicate that the proposed development and/or associated projects are environmentally acceptable or economically feasible in accordance with appropriate public law.”</i>			
	YES	NO	N/A
Do the Aviation Office’s final comments identify items that need to be corrected by the sponsor prior to approval of the completed project?			
1. If yes, has the corrected material been resubmitted?			
2. If no, has conditional approval been sent to the airport sponsor?			

Final Project Approvals		
	YES	NO
Do the final Airport Master Plan and ALP incorporate the review comments of FDOT and the FAA, Orlando ADO?		
Has the Aviation Office submitted a written response to the District Office recommending conditional approval of the Airport Master Plan and ALP?		
Has the FDOT District Office accepted the final deliverables?		
Has the FDOT District Office submitted an official correspondence to the airport sponsor accepting the master plan and conditionally approving the ALP?		
Have copies of all final deliverables been presented to the FDOT District Office?		
Have all required deliverables, along with their subsequent approvals, been received and distributed?		
Has a copy of the FAA-approved ALP set been sent to both the FDOT District and Aviation Offices? (Applicable to federally obligated airports)		
Does the District Office have the FAA-approved signed Master Plan and ALP set? (Applicable to federally obligated airports)		
Has final written approval been received by FDOT?		
Has a copy of the signed, FAA-approved ALP set, master plan, and final written approval been uploaded to JPM?		

Implementation of the Airport Master Plan		
	YES	NO
Have development projects listed in the new Facilities Implementation Plan Element of the Master Plan been entered and updated in the JACIP by the airport sponsor?		
Have projects from the Facilities Implementation Plan Element of the previous Airport Master Plan been deleted, as appropriate, from the JACIP by the airport sponsor?		

### What is it?

The following Appendix consists of an airport inventory and data survey form. This form was developed to assist airports in collecting and understanding their airport’s facilities and services when preparing for, scoping discussions and when completing an airport master plan. The form provides an organized overview of multiple facets of an airport to display basic and relevant information pertinent to the master planning process. The form includes topic areas such as landside facilities, runway information, based aircraft counts, as well as general airport information. This inventory form is intended to help airports collect information pertinent to the master planning process and assist them in categorizing and understanding their current conditions.

### How to Use it?

The inventory form is in a simple format allowing airports to go through each section and fill in information about their facilities and operations. Information can be gathered from multiple sources including the existing Airport Layout Plan (ALP), previous Master Plans, facility information records, the Florida Aviation Database, 5010s, as well as any other relevant sources. Certain aspects of the inventory form may not be applicable depending on an airport’s size and role. Users of the form are encouraged to only complete the form to the extent that it is beneficial to project being completed. Airports should consult appropriate documentation when filling out this form to ensure accurateness to the highest degree possible.

### Benefits

This form will prove beneficial to all airport-related employees, including consultants, in working to enhance the airport. By having all basic information laid out in a simplified overview format, those coordinating with an airport can gain an easy understanding of the existing facilities and uses. This form will also be helpful in familiarizing airport staff with the specifications of the airport. Completion of this form will help to facilitate an accurate collection of information readily available for reference as needed.

### Disclaimer

This document is in no way required by either the FAA or FDOT. It is provided solely as a reference to catalog facilities at airports. It does not need to be completed at any phase of a planning study and should be utilized only if the airport sponsor desires to do so.

## AIRPORT INVENTORY AND DATA SURVEY

Airport Name:	3-letter Identifier:
---------------	----------------------

GENERAL AIRPORT INFORMATION	
Airport Owner	
Airport Owner Address	
Airport Manager	
Airport Mailing Address	
County	
Phone Number	
Fax Number	
Airport Website URL	
Current FAA designated Airport Reference Code (ARC) and Runway Design Code (RDC):	
Airport Acreage:	

Runway/Taxiway	Primary Runway	Secondary Runway	Other	Other
Orientation (RWY designators)				
Length				
Width				
Surface Type				
Gross Weight (000s)				
Runway Markings Type-Condition				
Taxiway Type <sup>1</sup> (associated with RWY)				
Taxiway Width				
Declared Distances?				
Reason for Declared Distances:				
Displaced Threshold (Dist. In ft.)				
Reason for Displaced Threshold:				
Runway Safety Area (RSA) Issues				

Lighting/NAVAIDs				
Runway Lighting <sup>2</sup>				
Taxiway Lighting <sup>3</sup>				
PAPI or VASI – which end(s) <sup>4</sup>				
REIL	Yes <input type="checkbox"/> No <input type="checkbox"/>			
Approach Lighting System <sup>5</sup>	None			

NAVAIDs	YES	NO	
Rotating Beacon	<input type="checkbox"/>	<input type="checkbox"/>	
Wind Indicator	<input type="checkbox"/>	<input type="checkbox"/>	Lighted? Yes <input type="checkbox"/> No <input type="checkbox"/>
Segmented Circle	<input type="checkbox"/>	<input type="checkbox"/>	
Weather Reporting Equip.	<input type="checkbox"/>	<input type="checkbox"/>	

Notes:

<sup>1</sup> Full Parallel, Partial Parallel, Turnaround, Stub, none

<sup>2</sup> HIGH, MED, LOW for Runways. Please note if lighting is non-standard

<sup>3</sup> MED, LOW, REFL (Reflectors). Please note if lighting is non-standard

<sup>4</sup> P= PAPI, V= VASI

<sup>5</sup> MALS, MALSR, MALSF, ALSF, etc.

Instrument Approaches			
	Runway End	Instrument(s)	Lowest Approach Minimums
Runway			
Runway			
Other			
Other			

Considering the Airport's current ARC and approach minimal, are FAA separation standards being met for:

Separation Criteria	YES	NO	Separation Distance (ft.)
Runway Centerline to Parallel Taxiway Centerline	<input type="checkbox"/>	<input type="checkbox"/>	
Runway Centerline to Aircraft Parking Area	<input type="checkbox"/>	<input type="checkbox"/>	
Taxiway\Taxilane Centerline to Fixed or Moveable Object	<input type="checkbox"/>	<input type="checkbox"/>	

For Runway Protection Zones (RPZs), does the Airport have controlling interest (land ownership or easements) over the RPZs for each runway end?  No Control  Partial  Complete Control

Notes: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

#### AIRCRAFT HANGARS AND PARKING APRONS

Hangars	Number	% Occupied	Total Square Footage
T-hangars			
Conventional			
Portables/Other			
Transient Hangar			
<b>TOTAL</b>			
Hangar Waiting List	Yes <input type="checkbox"/>	No <input type="checkbox"/>	# of A/C on list _____

Tie-downs	Paved	Grass	Total Square Yards
How many tie-downs does the Airport provide?			
How many are provided for based aircraft?			
How many are provided for transient aircraft?			
<b>TOTAL</b>			
Tie-down Waiting List	Yes <input type="checkbox"/>	No <input type="checkbox"/>	# of A/C on list _____

#### LANDSIDE FACILITIES

Terminal Building	YES	NO
Does the Airport have a terminal building?	<input type="checkbox"/>	<input type="checkbox"/>
Terminal building owner		
Date Constructed/Modified or Updated?		
Approximate Square Footage		
Terminal Occupants (i.e., FBO, Admin., Flight School, etc.)		
Pilot Lounge?	<input type="checkbox"/>	<input type="checkbox"/>
Conference Room?	<input type="checkbox"/>	<input type="checkbox"/>
Flight Planning Room?	<input type="checkbox"/>	<input type="checkbox"/>
<b>Fire Protection/ARFF</b>	<b>YES</b>	<b>NO</b>
Does the airport have a mutual aid agreement?	<input type="checkbox"/>	<input type="checkbox"/>
<b>Equipment Buildings</b>	<b>YES</b>	<b>NO</b>
Does the Airport have an SRE building?	<input type="checkbox"/>	<input type="checkbox"/>
Does the Airport have a maintenance building?	<input type="checkbox"/>	<input type="checkbox"/>

#### AIRPORT SECURITY/ACCESS

Airport Security	YES	NO	Date Adopted
Does the Airport have a General Aviation Security Plan?	<input type="checkbox"/>	<input type="checkbox"/>	
Is the Airport equipped with an access control system to the Airport operating areas?	<input type="checkbox"/>	<input type="checkbox"/>	
Is the Airport equipped with CCTV?	<input type="checkbox"/>	<input type="checkbox"/>	
<b>Airport Access</b>	<b>Complete</b>	<b>Partial</b>	<b>None</b>
Does the Airport have a perimeter road?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Does the Airport have security fencing?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
What type of fencing?			

#### AUTOMOBILE PARKING

Does the Airport have sufficient automobile parking in all areas of the Airport? Yes  No   
 How many dedicated spaces near the terminal building? \_\_\_\_\_

#### AIRPORT FUELING INFRASTRUCTURE AND SERVICES

Airport Fueling	AvGas	Jet A
What types of fuel does the Airport provide?	<input type="checkbox"/>	<input type="checkbox"/>
What is the storage capacity? (in gallons)		
	<b>YES</b>	<b>NO</b>
Does the Airport offer self-fueling?	<input type="checkbox"/>	<input type="checkbox"/>
Are fueling services offered 24 hours a day?	<input type="checkbox"/>	<input type="checkbox"/>
If not, what are the hours that aircraft fueling is available?		
Does the Airport have active underground fuel storage?	<input type="checkbox"/>	<input type="checkbox"/>

**HISTORICAL AIRPORT FUEL SALES**

Year	AvGAS Gallons	JetA Gallons
2018		
2017		
2016		
2015		
2014		
2013		

**AIRPORT SERVICES AND ACCOMMODATIONS**

Check the services/accommodations that the Airport offers.

Service	YES	NO
Fixed Base Operator (FBO) How Many? _____	<input type="checkbox"/>	<input type="checkbox"/>
Courtesy Car	<input type="checkbox"/>	<input type="checkbox"/>
Flight Instruction	<input type="checkbox"/>	<input type="checkbox"/>
Full Time Flight School	<input type="checkbox"/>	<input type="checkbox"/>
Aircraft Maintenance Services	<input type="checkbox"/>	<input type="checkbox"/>
Airframe Repairs	<input type="checkbox"/>	<input type="checkbox"/>
Power Plant Repairs	<input type="checkbox"/>	<input type="checkbox"/>
Avionics Repair Shop	<input type="checkbox"/>	<input type="checkbox"/>
FAA Part 145 Repair Station	<input type="checkbox"/>	<input type="checkbox"/>
Aircraft and/or Avionics Sales	<input type="checkbox"/>	<input type="checkbox"/>
Snow Removal Operations	<input type="checkbox"/>	<input type="checkbox"/>
Aircraft Deicing	<input type="checkbox"/>	<input type="checkbox"/>
Aircraft Oxygen (Bottled Oxygen)	<input type="checkbox"/>	<input type="checkbox"/>
Catering Services	<input type="checkbox"/>	<input type="checkbox"/>
Aircraft Lavatory Disposal Services	<input type="checkbox"/>	<input type="checkbox"/>

**ENVIRONMENTAL STEWARDSHIP**

Please check all that apply to the Airport:

- In compliance with EPA's SPCC (Spill Prevention, Spill Control, Spill Countermeasure) requirements.
- In compliance with EPA's SWPPP (Stormwater Pollution Prevention Plan) requirements.
- Alternative fuel vehicles or other alternative fuel equipment at the Airport.
- Recycling Program in place at the Airport.

**AIRCRAFT OPERATIONS ACTIVITY TYPES**

Operation	YES	NO	Operation Based at the Airport?
Air Taxi	<input type="checkbox"/>	<input type="checkbox"/>	Yes <input type="checkbox"/> No <input type="checkbox"/>
Aircraft Charter	<input type="checkbox"/>	<input type="checkbox"/>	Yes <input type="checkbox"/> No <input type="checkbox"/>
Air Cargo Operations	<input type="checkbox"/>	<input type="checkbox"/>	Yes <input type="checkbox"/> No <input type="checkbox"/>
Emergency Medical Aircraft Operations	<input type="checkbox"/>	<input type="checkbox"/>	Yes <input type="checkbox"/> No <input type="checkbox"/>
Angel Flight	<input type="checkbox"/>	<input type="checkbox"/>	Yes <input type="checkbox"/> No <input type="checkbox"/>

Operation	YES	NO	Operation Based at the Airport
Agricultural Aircraft Operations	<input type="checkbox"/>	<input type="checkbox"/>	Yes <input type="checkbox"/> No <input type="checkbox"/>
Law Enforcement Aircraft Operations	<input type="checkbox"/>	<input type="checkbox"/>	Yes <input type="checkbox"/> No <input type="checkbox"/>
Pipeline Control Aircraft Operations	<input type="checkbox"/>	<input type="checkbox"/>	Yes <input type="checkbox"/> No <input type="checkbox"/>
Military Exercises/Training	<input type="checkbox"/>	<input type="checkbox"/>	Yes <input type="checkbox"/> No <input type="checkbox"/>
Skydiving Operations	<input type="checkbox"/>	<input type="checkbox"/>	Yes <input type="checkbox"/> No <input type="checkbox"/>
Other:	<input type="checkbox"/>	<input type="checkbox"/>	Yes <input type="checkbox"/> No <input type="checkbox"/>
Other:	<input type="checkbox"/>	<input type="checkbox"/>	Yes <input type="checkbox"/> No <input type="checkbox"/>
Other:	<input type="checkbox"/>	<input type="checkbox"/>	Yes <input type="checkbox"/> No <input type="checkbox"/>

**EXISTING AIRPORT PLANS**

Plan/Study/Policy	YES	NO	Date Completed
Airport Master Plan	<input type="checkbox"/>	<input type="checkbox"/>	
Airport Layout Plan	<input type="checkbox"/>	<input type="checkbox"/>	
Capital Improvement Plan	<input type="checkbox"/>	<input type="checkbox"/>	
Airport Business Plan	<input type="checkbox"/>	<input type="checkbox"/>	
Airport Minimum Standards	<input type="checkbox"/>	<input type="checkbox"/>	
Airport Rules and Regulation Policy	<input type="checkbox"/>	<input type="checkbox"/>	
Aeronautical Obstruction Survey	<input type="checkbox"/>	<input type="checkbox"/>	
Obstruction/Approach Analysis	<input type="checkbox"/>	<input type="checkbox"/>	
Airport Noise Study (Part 150)	<input type="checkbox"/>	<input type="checkbox"/>	
Airport Noise Contours	<input type="checkbox"/>	<input type="checkbox"/>	
Established Airport Noise Abatement Procedures	<input type="checkbox"/>	<input type="checkbox"/>	
Wildlife Management Plan	<input type="checkbox"/>	<input type="checkbox"/>	
Airport Emergency Plan	<input type="checkbox"/>	<input type="checkbox"/>	
Snow and Ice Control Plan/Winter Operations Plan	<input type="checkbox"/>	<input type="checkbox"/>	
Airport Pavement Management Plan	<input type="checkbox"/>	<input type="checkbox"/>	
Environmental Plans	Yes	No	Date Completed
Environmental Assessment/Environmental Impact Statement	<input type="checkbox"/>	<input type="checkbox"/>	
Comprehensive Solid Waste Management Plan	<input type="checkbox"/>	<input type="checkbox"/>	

**LAND USES AND EXPANSION POTENTIAL**

Does the Airport have land available for future development? Yes  No

If YES: Yes  No

Is electric power available to the site? Yes  No

Is water available to the site? Yes  No

Is wastewater treatment available to the site? Yes  No

Is natural gas available at the site? Yes  No

Is a communication transmission medium available to the site? Yes  No

Is this land depicted on the current ALP? Yes  No

Approximate Acreage: \_\_\_\_\_

Additional explanation:

---



---



---

Who has the local zoning authority for the area around the airport?

---



---

Has height zoning that follows FAR Part 77 and Ch. 333 guidelines been adopted? Yes  No

Does the community have airport compatible land use zoning in the area surrounding the airport? Yes  No  If yes, is this zoning adequately enforced? Please discuss.

\_\_\_\_\_

---



---

**AIRPORT BUSINESSES**

Identify major or unique users of the Airport or businesses dependent on the Airport.

Airport User Firm or Group	Aircraft Type(s)	Aircraft Based at Airport (Y/N)?	Contact Information

**HISTORICAL BASED AIRCRAFT AND OPERATIONS DATA**

10-Year Based Aircraft Data

Year	Single-engine		Multi-engine		Jet	Helo	Glider	Ultra-light	Military	Total
	Piston	Turbine	Piston	Turbine						
2018										
2017										
2016										
2015										
2014										
2013										
2012										
2011										
2010										
2009										

Source: \_\_\_\_\_

Indicate the most demanding airplane (critical aircraft) that operates at the Airport on a regular basis (at least 500 takeoffs/landings per year, excluding touch-and-go operations). \_\_\_\_\_

**10-Year Aircraft Operations Data**

Year	Air Taxi	General Aviation (Local)	General Aviation (Itinerant)	Military	Total
2018					
2017					
2016					
2015					
2014					
2013					
2012					
2011					
2010					
2009					

Source: \_\_\_\_\_

What is the typical split between daytime and nighttime operations (nighttime is defined as 10PM to 7AM)? \_\_\_\_\_

What percentage of the local operations is considered touch-and-go or training? \_\_\_\_\_%

How many annual instrument approaches were conducted in 2018? \_\_\_\_\_

### Emerging Trends

Planners should be sure they are reviewing and applying emerging trends with the aviation and related industry. New technologies may affect capacity efficiency, facility geometry, or demand. Some trends may fall short, such as the proposed Very Light Jet (VLJ) revolution in the 2000's that pressed airports to design facilities specific to those type of aircraft. While VLJs are used, the market did not expand as expected and some of the hangars built for these companies sat empty for many years before another tenant took over. Other trends such as Unmanned Aircraft Systems (UAS) or drones have become very popular in the commercial and recreational market. Presented below are current emerging trends that may need to be considered during the Master Plan process depending on their applicability to the individual airport.

### Sustainability

As it relates to airports, sustainability can be considered in the context of administration, procurement, planning, design, construction, maintenance, and operations. The sustainability framework can consist of policies, procedures, and practices that reduce facility and operational costs as a result of better utilization of resources, higher levels of efficiency, and a greater emphasis on planning. As the FAA and FDOT are striving to incorporate sustainability into all projects, a sponsor should determine an appropriate overall sustainability goal(s) and review individual efforts to achieve them. Airports that implement sustainable practices may benefit from reduced resource usage, improved passenger satisfaction, a more strategic use of airport property, and reduced waste generation and increased recycling. As such, facility requirements and future planning should incorporate sustainability initiatives. FDOT has developed an Airport Sustainability Guidebook that provides information and guidance that can be referenced during the Master Planning process. The Guidebook can be accessed at <http://www.fdot.gov/Aviation/Sustainability.shtm>.

The FAA recommends reviewing *Interim Guidance and Lessons Learned for FAA's Sustainable Master Plan Pilot Program* and the *ACRP Synthesis 10, Airport Sustainability Practices*.

### NextGen

The National Airspace System (NAS) is being modernized by the **Next Generation Air Transportation System (NextGen)**. Initiatives will affect flight plans and can have noise impacts, as well as impacts to navigation aids, airspace, airfield capacity, and obstruction management. While some initiatives are already being implemented like Performance Based Navigation (PBN) and Automated Dependent Surveillance-Broadcast (ADS-B), more programs are in their initial stages of deployment such as weather, voice systems, information management, and data communications. Each of these programs is geared towards improving one facet of the safety and efficiency of the aviation transportation system.

#### Florida Specific Information!

FDOT has developed an Airport Sustainability Guidebook that provides information and guidance that can be referenced during the Master Planning Process



There are several ACRP 150 Reports on NextGen available, including:

- [NextGen for Airports, Volume 1: Understanding the Airport's Role in Performance-Based Navigation: Resource Guide](#)
- [NextGen for Airports, Volume 2: Engaging Airport Stakeholders: Guidebook](#)
- [NextGen for Airports, Volume 3: Resources for Airport](#)
- [NextGen for Airports, Volume 4: Leveraging NextGen Spatial Data to Benefit Airports: Guidebook](#)

### Personal Use of Technology

Technology advancements affect every person from the moment they consider taking a flight, whether on a GA or commercial aircraft. The flying experience has been transformed to allow passengers to self-check-in via smart phones, pilots to obtain in flight weather on their tablet, and the community to know when there are construction delays on the roads to the airport via social media. The more an airport can stay connected to its users and utilize technology the stronger its position will be. This is directly connected to the way an airport brands or markets itself and the infrastructure to provide its passengers. ACRP Report 70: Guidebook for Implementing Intelligent Transportation System Elements to Improve Airport Traveler Access Information assists airports in how they may provide this information and disseminate to passengers.

### Economics

Airports and airlines are always seeking creative ways to maintain their market share. This has resulted in certain tax exemptions on aviation activities to make a state, airport, or company more attractive, consolidation of services and airlines to create an economy of scale and reduce competition, increased advertising methods at the airport, and increasing customer service efforts. These economic factors need to be considered in how they will affect future revenues and space requirements.

### Emergency Planning

Emergencies at airports go beyond terrorism concerns to events such as hurricanes that can destroy essential navigation equipment and disrupt services for weeks, the containment of infectious diseases such as the Ebola outbreak in 2014, Zika in 2016, or other events that would impact aircraft travel. Understanding how these events may impact the day-to-day operations and providing appropriate response tools will allow the airport to return to normal operations quicker. This could include identifying training necessities or facilities such as an Emergency Operations Center (EOC). ACRP Report 189 Design Considerations for Airport EOCs provides guidance on facility design.

*ACRP Report 12, An Airport Guide for Regional Emergency Planning for Chemical, Biological, Radiological, Nuclear, or Explosive (CBRNE) Events* provides details on how airports should cover hazard and threat assessments. *ACRP Report 94: Integrating Web-Based Emergency Management Collaboration Software into Airport Operations* is a primer on how to evaluate and implement tools for emergency response management.

### Regional Access/Multi-Modal

Regional access to airports has been identified as a reoccurring problem across the nation as airports are not always considered in the regional transportation planning process. Viable multi-modal transportation options that connect GA and commercial airports to the regional system are needed as populations and flight activity increase and users look for alternative methods to travel.

*ACRP Report 118: Integrating Aviation and Passenger Rail Planning* explores planning options, funding challenges, and potential actions to improve integration of rail services with airports, particularly in congested corridors.

### Unmanned Aircraft Systems (UAS)

UAS, better known as drones, are beneficial to numerous civilian activities such as search and rescue operations, assessing ongoing threats from ho|stage situations to wildfires, assisting with inspections of hard to reach infrastructure such as bridges, and gathering data on weather and emissions. The use of drones has dramatically increased over the past several years into what many pilots and airport sponsors consider a safety hazard to the national airspace system. While **federal UAS regulations** restrict drone usage in certain areas and altitudes, these regulations can be difficult to enforce. Further research and trials will be necessary to determine the best ways to integrate drones into the airspace system, especially when arriving to and departing from airports. *ACRP Report 144: Unmanned Aircraft Systems (UAS) at Airports: A Primer* provides airports of all sizes with information about unmanned aircraft systems (UAS) and their potential use and impact on airports

FAA guidance pertaining to the operations of UAS within the national airspace system was released in 2016. The Small Unmanned Aircraft Rule (Part 107) required airports to treat UAS activity as an aviation activity, and as such, may not prohibit its activity at their airport. No additional guidance has been provided to airport sponsors and operators on implementation of incorporating this type of activity at this time. Through Part 107 UAS operators are required to obtain a remote pilot certificate, register the UAS with the FAA, maintain visual line-of-sight (VLOS) with their UAS, as well as abide by several other restrictions. More information on these restrictions can be found at: [https://www.faa.gov/uas/media/Part\\_107\\_Summary.pdf](https://www.faa.gov/uas/media/Part_107_Summary.pdf).

14 CFR 99.7 – Special Security Instructions (SSI) has prohibited all UAS flights within certain areas up to 400 feet AGL. These areas include National Parks, Special Use Airspace, sporting events, wildfires, and other areas identified under UAS Notices to Airmen (NOTAM) FDC 7/7137. Additionally, recreational operations are required to give notice for flights within five miles of a towered airport to both the airport operator and ATC. Operations around Class B airspace, major commercial airports, are required to have specific permission and coordination with ATC. Specific Florida laws pertaining to UAS operators are provided in Chapter 934.50 F.S., which prohibits UAS for collection of evidence by a law enforcement agency with a few exceptions.

There are additional topics that may need to be addressed on a case-by-case basis for some airports; the [FAA Advisory Circulars](#) and [Airport Cooperative Research Program \(ACRP\)](#) provides information on such topics.

### Air Traffic Control Tower (ATCT)

FAA Order 6480.4A, *Airport Traffic Control Tower Siting Criteria* provides guidance on the optimal location and height of new and replacement ATCT. Controllers must have adequate airfield visibility in an ATCT to ensure safe operations. Orientation based on sun or lighting glare, weather patterns, look-down and look-up angles, site access, security, and cost are all considerations when selecting an ATCT site.

Prior to new airfield development, airports should review the line-of-sight from the tower to ensure controllers can adequately view all movement areas and potentially determine any currently obscured areas. This analysis can be completed using 3-D technology.

If an airport does not have an ATCT and wishes to establish one, the FAA must be involved. FAR Part 170, *Establishment and Discontinuance Criteria for Air Traffic Control Services and Navigational Facilities* provides the authority to the Federal government to establish an ATCT. This FAR lists the following minimum criteria: open to the public, within the NPIAS, assurance that airport will remain open, available land to place ATCT, and meet the benefit-cost ratio (B/C).

The B/C is based on the annual traffic counts and provides a quantifiable number to assist with determining whether the airport should be supported with an ATCT. Benefits include collisions avoided, preventable accidents, flight efficiencies and cost is of the annual cost of operating the ATCT. The FAA may choose to provide an ATCT at that FAA fully funds or cost-sharing through a contract tower. Contract towers are monitored by the FAA and all controllers are certified, but provide services at costs substantially lower than if provided directly through the Federal government.

### Air Cargo

Air cargo can range from fresh flowers to appliances and in size from small local deliveries to large global carriers. *The Florida Air Cargo System Plan Updates and Brochure* provides details on the air cargo activities in Florida including the importance of supporting airports within the overall transportation network to ensure cargo can be moved from aircraft to vehicles. Florida's Strategic Intermodal System (SIS) airports moved 2.5 million tons of air cargo internationally in 2011, serving 41 domestic and 94 international destinations. Reviewing operations and facilities on-airport and in surrounding areas ensures necessities are being met and growth opportunities are considered. This review may include an air cargo terminal, apron space, overnight parking spaces, ground access, and additional security. [ACRP Report 143, Guidebook for Air Cargo Facility Planning and Development](#) explores tools and techniques for the sizing of air cargo facilities.

### Maintenance and Rehabilitation of Facilities

Facilities such as hangars, support buildings, roads, fences, parking lots, must be maintained and periodically rehabilitated to ensure their full lifespan. This becomes especially important at an airport where limited funding and constant use can lead to a facility being used beyond its originally estimated lifespan. Understanding the potential impacts to a facility improves the planning process for these types of projects. Reviewing of the existing conditions of all facilities should result in the determination of good, fair, or poor (see [ACRP Report 138 Volume 1](#) and [Volume 2, Preventive Maintenance at General Aviation Airports](#)).

### Surplus Property

In certain cases, the master planning process may determine that there is a surplus of land within the airport boundary that may have more valuable, non-aviation use. Per Grant Assurance 31, no airport sponsor may sell or dispose of acquired property without FAA approval. Per Grant Assurance 29, non-aeronautical use must be shown on the ALP, which is subject to FAA approval. The property must be justified that it truly is surplus and not be necessary for future aviation activity. The FAA would prefer that surplus property be leased rather than sold and will require contingencies that any future use will adhere to airport compatible land use requirements. The property must be sold at Fair Market Value (FMV) and any revenue from the sale must be utilized at the airport or used to repay the FAA for any federal grants tied to the property. More information on the required documentation may be found on the FAA website at: [www.faa.gov/airports/central/airport\\_compliance/release/](http://www.faa.gov/airports/central/airport_compliance/release/).

### Utilities

The existing and future needs for utilities such as electricity, communications, water, sewer, Internet, and drainage should be evaluated within the airport boundary and adjacent property. As airports move towards self-sufficiency, providing basic needs for compatible development is key. While the FAA does not typically fund utility extensions, more and more states are providing funding for such projects to spur economic growth.

### Space Travel

Given Florida's history of space travel with the Kennedy Space Center at Cape Canaveral and new prospects for commercial space travel within the U.S., planning for space facilities should be considered. The *2015 Florida Spaceports Project Handbook* provides an overview on how to obtain funding from the FDOT for spaceport projects. More information can be found at: [www.dot.state.fl.us/aviation/spaceports.shtm](http://www.dot.state.fl.us/aviation/spaceports.shtm).

### Americans with Disabilities Act (ADA) Compliance

The FAA provides guidance through **Section 504** Airport Disability Compliance Program regarding ADA requirements. The *2010 ADA Standards for Accessible Design* should be considered as it relates to facility planning.

### Through-the-Fence (TTF) Operations

Through-the-fence (TTF) operations occur when airport sponsors provide access to airside facilities (e.g., runway) to operators that have facilities adjacent to, but not within, airport property limits. TTFs have been controversial as they can interfere with a sponsor's ability to meet its **Federal obligations** as a federally assisted public-use airport. *FAA Grant Assurance 5, Preserving Rights and Powers*, includes provisions that prohibit TTF access to any location at an airport. Further, the FAA's *78 Federal Regulation 42419* prohibits new residential TTF activities and states that, to receive further Federal funding, a plan must be in place to show how potential TTF issues will be mitigated.

TRB's [ACRP Report 114, Guidebook for Through-the-Fence Operations](#) provides information on these types of operations and how to assess them. Additional information on TTF operations is provided by the FAA at: [www.faa.gov/airports/airport\\_compliance/residential\\_through\\_the\\_fence/](http://www.faa.gov/airports/airport_compliance/residential_through_the_fence/).

### Energy

To increase sustainability both environmentally and economically, more airports are reviewing their energy uses. This may include reviewing new lighting technologies or installing solar farms and wind turbines. Numerous airport design characteristics and Federal regulations must be reviewed as part of this effort.

More information can be found in TRB's *ACRP Report 141, Renewable Energy as an Airport Revenue Source* and [ACRP Report 108, Guidebook for Energy Facilities Compatibility with Airports and Airspace](#).

### Cyber Security

As society moves to a more digital infrastructure, more airport systems are vulnerable to a cyber-attack. It is prudent for airport management to understand threats to systems like airfield lighting, baggage systems, or weather stations and how to reduce their risk. Additional information can be found at TRB's [ACRP Report 140, Guidebook on Best Practices for Airport Cybersecurity](#).

### Safety Management System (SMS)

SMS is the formal approach to managing safety risks and comprises safety policy, safety risk management, safety assurance, and safety promotion. SMS development is currently a voluntary program. FAA provides a SMS Quick Reference Guide. (<https://www.faa.gov/about/initiatives/sms/explained/>) that gives an overview as well as additional Federal resources to review. The Draft AC 150/5200-37A Safety Management Systems for Airports, released in 2016, provides detailed guidance on developing and implementing SMS on an airport. TRB's *ACRP Safety Management Systems for Airports Volume 1* and **Volume 2** provide additional information on the components of SMS and implementation ([www.trb.org/Publications/PubsACRPProjectReports.aspx](http://www.trb.org/Publications/PubsACRPProjectReports.aspx)). The International Civil Aviation Organization (ICAO) also has published guidance related to SMSs, it can be found at:

[www.icao.int/safety/safetymanagement/pages/annex-19,-1st-edition---executive-summary.aspx](http://www.icao.int/safety/safetymanagement/pages/annex-19,-1st-edition---executive-summary.aspx).

### Snow Removal Equipment and Deicing

Florida's geographic location and climate result in less extreme winter conditions. However, airports in North Florida such as Tallahassee International Airport keep deicing equipment on site. If appropriate for a specific airport based on weather patterns or user needs, snow removal containment and storage facilities need to be reviewed. FAA [AC 150/5300-14C, Design of Aircraft Deicing Facilities](#) and FAA [AC 120-60B, Ground Deicing and Anti-icing Program](#) provide information on deicing programs. FAA [AC 150-5220-20A, Airport Snow and Ice Control Equipment](#) and FAA [AC 150/5220-18A, Buildings for Storage and Maintenance of Airport Snow and Ice Control Equipment and Materials](#) should also be reviewed to ensure that proper processes are being followed with regards to snow removal equipment and deicing.

# PART 3 – MASTER PLANS: PRODUCT DEVELOPMENT

## APPENDIX 8: ACRONYMS

The acronyms presented herein are intended for use with this Guidebook only.

AAA	Airport Airspace Analysis	CCNA	Consultant's Competitive Negotiation Act	GARB	General Airport Revenue Bond	NTP	Notice to Proceed
AAC	Aircraft Approach Category	CCTV	Closed-Circuit Television	GIS	Geographic Information systems	O&D	Origin-&-Destination
AAGR	Average Annual Growth Rate	CDG	Checkpoint Design Guide	GQS	Glidepath Qualification Surface	OAG	Official Airline Guide
AC	Advisory Circular	CEQ	Council on Environmental Quality	HPF	Historical Preservation Fund	OAP	Obstacle Action Plan
ACN	Aircraft Classification Number	CFASPP	Continuing Florida Aviation System Planning Process	IFR	Instrument Flight Rule	OE	Obstruction Evaluation
ACRP	Airport Cooperative Research Program	CFC	Customer Facility Charge	ILS	Instrument Landing System	OEI	One-Engine Inoperative
ADA	Americans with Disability Act	CFR	Code of Federal Regulations	IRR	Internal Rate of Return	OFA	Object Free Area
ADG	Airplane Design Group	CIP	Capital Improvement plan	JACIP	Joint Automated Capital Improvement Program	OFZ	Obstacle Free Zone
ADO	Airports District Office	CMG	Cockpit-to-Main Gear	JPA	Joint Participation Agreement	OPBA	Operations Per Based Aircraft
ADS-B	Automated Dependent Surveillance-Broadcast	DBE	Disadvantaged Business Enterprise	LASP	Large Aircraft Security Program	PA	Precision Approach
AGIS	Airport Geographic Information System	DEP	Department of Environmental Protection	LCP	Local Comprehensive Plan	PACS	Primary Airport Control Station
AIP	Airport Improvement Program	DHS	Department of Homeland Security	LF	Load Factor	PAL	Planning Activity Level
ALP	Airport Layout Plan	DPRC	Departure Reference Code	LGCP	Local Government Comprehensive Plan	PAS	Publicly Available Specification
AMPU	Airport Master Plan Update	DRI	Development of Regional Impact	LL	Low Lead	PBN	Performance Based Navigation
APO	Aviation Policy and Plans	EA	Environmental Assessment	LNAV	Lateral Navigation	PCI	Pavement Condition Index
APRC	Approach Reference Code	eALP	Electronic Airport Layout Plan	LPV	Localizer Performance with Vertical Guidance	PCN	Pavement Condition Numbers
APV	Approach with Vertical Guidance	ECC	Energy and Climate Commission	M&R	Maintenance and Repair	PCPI	Personal Per Capita Income
ARC	Airport Reference Code	EIS	Environmental Impact Statement	MAP	Military Airport Program	PCSSP	Private Charter Standard Security Program
ARFF	Aircraft Rescue and Firefighting	EO	Environmental Overview	MGW	Main Gear Width	PD&E	Project Development and Environmental
ARP	Airport Reference Point	EOC	Emergency Operations Center	MPO	Metropolitan Planning Organization	PEIR	Project Environmental Impact Report
ARP	Airport Reference Plan	EPA	Environmental Protection Agency	MRO	Maintenance, Repair and Overhaul	PFC	Passenger Facility Charge
ASOS	Automated Surface Observing System	EST	Environmental Screening Tool	MSL	Mean Sea Level	PIP	Public Involvement Plan
ASPM	Aviation System Performance Metrics	F.S.	Florida Statute	NAS	National Airspace System	PMAD	Peak Monthly Average Day
ASQP	Airline Service Quality Performance	FAA	Federal Aviation Administration	NAVAID	Navigational Aid	POFZ	Precision Obstacle Free Zone
ASV	Annual Service Volume	FAC	Florida Administrative Code	NCDC	National Climatic Data Center	PTGA	Public Transportation Grant Agreement
ATCTAir	Traffic Control Tower	FAD	Florida Aviation Database	NEPA	National Environmental Policy Act	RDC	Runway Design Code
AWOS	Automated Weather Observing System	FAR	Federal Aviation Regulations	NextGen	Next Generation Air Transportation System	RFP	Request for Proposal
BCA	Benefit/Cost Analysis	FASP	Florida Aviation System Plan	NFPA	National Fire Protection Association	RFQ	Request for Qualifications
BEBR	Bureau of Economic and Business Research	FATO	Final Approach and Takeoff Area	NGS	National Geodetic	RNAV	Area Navigation
BIM	Building Information Modeling	FBO	Fixed Base Operator	NMSA	Non-Major State Action	ROFA	Runway Object Free Area
BRL	Building Restriction Line	FDOT	Florida Department of Transportation	NOAA	National Oceanic and Atmospheric Administration	ROFZ	Runway Object Free Zone
CAC	Citizens Advisory Committee	FHWA	Federal Highway Administration	NOTAM	Notice to Airmen	ROI	Return on Investment
CAD	Computer-Aided Design	FIS	Federal Inspection Services	NPA	Non-Precision Approach	ROW	Right-of-Way
CADD	Computer-Aided Drafting and Design	FMRA	FAA Modernization and Reform Act	NPE	Non-Primary Entitlements	RPZ	Runway Protection Zone
CATEX	Categorical Exclusion	FMV	Fair Market Value	NPIAS	National Plan of Integrated Airport Systems	RSA	Runway Safety Area
CBRNE	"Chemical, Biological, Radiological, Nuclear or Explosive"	FOD	Foreign Object Debris	NPR	National Priority Ranking	RSAD	Runway Safety Area Determination
		FTP	Florida Transportation Plan	NPS	National Priority System	RVR	Runway Visual Range
		GA	General Aviation	NSRS	National Spatial Reference System	RVZ	Runway Visibility Zone

SACS	Secondary Airport Control Station	SOP	Standard Operating Procedure	TLOF	Touchdown and Liftoff	USDA	United States Department of Agriculture
SAPMP	Statewide Airfield Pavement Management Program	SOW	Scope of Work	TLOFA	Taxilane Object Free Area	USFWS	United States Fish and Wildlife Services
SAV	Surface Analysis Visualization	SPCC	Spill Prevention Control and Countermeasure	TOFA	Taxiway Object Free Area	VFR	Visual Flight Rule
SEIR	State Environmental Impact Report	SRE	Snow Removal Equipment	TRB	Transportation Research Board	VGSI	Visual Glideslope Indicator
SFB	Special Facility Revenue Bond	SWPPP	Stormwater Pollution Prevention Plan	TRIP	Transportation Regional Incentive Program	VLJ	Very Light Jet
SIAP	Standard Instrument Approach Procedure	TAC	Technical Advisory committee	TSA	Transportation Security Administration	VLOS	Visual Line-of-Sight
SIB	State Infrastructure Bank	TAF	Terminal Area Forecast	TSA	Taxiway Safety Area	VNAV	Vertical Navigation
SIS	Strategic Intermodal System	TDG	Taxiway Design Group	TSS	Threshold Siting Surface	VOR	Very-High Omnidirectional Range
SMGCS	Surface Movement Guidance and Control System	TERPS	Terminal Instrument Procedures	TTF	Through-the-Fence	WAAS	Wide Area Augmentation System
SMS	Safety Management System	TFMSC	Traffic Flow Management System Counts	UAS	Unmanned Aircraft Systems		
SOAR	Systems of Airport Reporting	TFSSP	Twelve-Five Standard Security Program	USC	United States Code		





**GUIDE BOOK FOR AIRPORT MASTER PLANNING 2019–2020**