Florida Department of Transportation
Aviation Office

GUIDEBOOK FOR AIRPORT MASTER PLANNING

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I. THE PROCESS OF PREPARING MASTER PLAN STUDIES

A. INTRODUCTION

An Airport Master Plan is a projection of an airport's conceptual long-term facility development. This plan is documented and approved by the local governmental agency or authority, which owns and/or operates the airport. A master plan reports the data and the logic upon which the plan is based in a narrative format, and displays the ultimate development concepts graphically in an Airport Layout Plan (ALP) set of drawings. Airport master plans are regularly updated to support maintenance, 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.

1. Guidebook Overview

To support the preparation of master plans the Florida Department of Transportation (FDOT), Aviation Office has developed this guidebook for use by airport owners/sponsors, operators, and consultants on General Aviation (GA) and commercial service airports throughout the state in order to assist in developing effective and appropriate 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. This structured and measured approach is critical so that improvement recommendations from a master planning process ultimately become the foundation of the FDOT Joint Automated Capital Improvement Plan (JACIP), which is used to program airport development grants.

Various factors cause an airport to reassess or update their master plans. When this occurs, the owner/sponsor should refer to 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 both planning report elements and drawing 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 investigation. Therefore, the guidebook has been categorized for various airport facilities based on service characteristics. It also suggests appropriate planning products, although it is understood that each planning effort is a unique endeavor and should reflect each airport's specific goals, objectives, and special issues.

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 understand the planning process better, the role of key reviewers, and the components of an approved plan. This last consideration is critical since all completed airport master plans must ultimately be submitted to FDOT and to the Federal Aviation Administration (FAA) for a final review and approval.

Finally, this guidebook provides a listing of references, including advisory circulars and other publications that the user can utilize to research a specific planning related subject in detail. Additionally, various checklists have been supplied as a convenient way to help ensure that appropriate steps in the planning process are complete and meet FDOT standards.

2. FDOT Master Plan Process Overview

The airport master planning process begins when an airport sponsor requests assistance from FDOT to initiate a master planning project. The planning request is subsequently entered into the work program through the JACIP process. In the fiscal year prior to the master plan project commencing, a project justification and scoping meeting with the Orlando Federal Aviation

Administration (FAA) Airports District Office (ADO) (if applicable) and the airport sponsor should be held with the FDOT Aviation Office to establish a preliminary scope of work and to develop a cost estimate for the project. At this meeting, the airport sponsor should also be prepared to provide a well-organized rationale to support the planning effort that includes the goals of the effort and the issues that the study will be designed to resolve.

Upon the issuance of a planning grant and/or a Joint Participation Agreement (JPA) that reflects the costs established in the prior scope meeting, the master planning project would commence at the point when the ADO issues a formal Notice To Proceed (NTP). Following the NTP, the ADO will then participate in the master planning process by monitoring project performance, reviewing product deliverables, and processing invoices. The final step in the process is final project review and approval. It is important to note that the ADO will perform these activities in close coordination with the FDOT Aviation Office through the JPA review and approval process.

Understand that this close relationship between FAA and FDOT is critical for ensuring a successful and appropriate master planning project process. As defined within FAA Advisory Circular (AC) 150/5070-6, Airport Master Plans, the FAA's role is to review master planning elements and approve only two specific elements of the master plan itself – the forecasts of aviation activity and the ALP set. As such, the ADO also relies heavily on the FDOT Aviation Office to review the draft deliverables to ensure that they comply with FAA and state standards and guidelines. The master plan must also be compatible with the Florida Aviation System Plan (FASP). While the ADO can only approve the forecasts and the ALP, the FDOT Aviation Office is in a position to provide comment and approve all elements of the airport master plan. This affords greater control of the process, ensuring a higher quality work product.

B. PURPOSE AND APPLICATION – WHAT IS A MASTER PLAN UPDATE

Providing a vision and planning for the future of an airport is a significant responsibility for any airport sponsor. Generally, airport planning has been described as the employment of an organized strategy for the future management and development of airport operations, facility designs, airfield configurations, financial allocations and revenues, environmental impacts, and organizational structures. Within the spectrum of airport planning, there is a wide variety of types of planning studies, ranging from project level to aviation system level.

The basis of airport planning at the local or airport level is that of the airport master plan. At its core, an airport master plan is a comprehensive analysis of an airport that typically describes an airport's short-, medium-, and long-term development plans to meet its future aviation demand requirements. Note that the elements of a master planning process will vary in complexity and level of detail, depending on the size, function, issues, and conditions of the individual airport. However, all useful airport master plans will effectively present the research, process, and logic from which the ultimate development plan was evolved and display that plan in a professionally designed report that effectively communicates the results of the plan to appropriate users.

1. Master Plan Purpose

The overall purpose of an airport master plan is to provide the framework to guide future airport development that will meet existing and future aviation demand in a safe and cost-effective manner. The master plan further considers environmental, socioeconomic and community development factors, as well as other modes of transportation and other airports. Per FAA AC 150/5070-6, *Airport Master Plans*, each master plan should meet the following objectives:

- Document the issues that the proposed development will address.
- Justify the proposed development through the technical, economic, and environmental investigation of concepts and alternatives.
- Provide an effective graphic presentation of the development of the airport and anticipated land uses near the airport.
- Establish a realistic schedule for the implementation of the development proposed in the plan, particularly the short-term capital improvement program.
- Propose an achievable financial plan to support the implementation schedule.
- Provide sufficient project definition and detail for subsequent environmental evaluations that may be required before the project is approved.
- Present a plan that adequately addresses the issues and satisfies local, state, and Federal regulations.
- Document policies and future aeronautical demand to support municipal or local deliberations on spending, debt, land-use controls, and other policies necessary to preserve the integrity of the airport and its surroundings
- Set the stage and establish the framework for a continuing planning process. Such a process should monitor key conditions and permit changes in plan recommendations as required.

2. Master Planning Process

An airport master plan is an organized collection of information, analyses, and resulting decisions and policies guiding the future development of an airport over a specified period, usually 20 years.

The master planning process itself can vary with the size, complexity, and role that the study airport plays within the system, and could include a variety of supporting studies. However, all master planning studies should include a series of elements that are considered fundamental to the study process. Typical informational items or elements that comprise a master plan include the following:

- Goals and objectives of the master plan
- An inventory of existing airport facilities and operating conditions
- A forecast of aviation activity at the airport over a specified planning period, typically 20 years
- An analysis of forecast demand for services compared to the capacity of the existing airport facilities available to meet that demand
- Requirements for future airport facilities as determined by identifying any disparity between the airport's existing facilities and the forecast demand for facilities
- An analysis of alternative airport facility and operational capacity solutions could be required in some complex situations.
- An airport layout plan that consists of computer assisted drawings (CAD) of existing and proposed airport property and facilities
- A brief overview of the potential environmental considerations that may require analysis when instituting any new proposed airport development project
- A Capital Improvement Program (CIP) that itemizes costs, as well as provides a schedule of needed airport improvements over the planning period
- A financial analysis developed along with the CIP that establishes options for how the needed airport improvements could be financed
- A cost-feasible financial plan, approved by FDOT, to accomplish the projects described in the airport master plan or depicted in the airport layout plan. The cost-feasible financial plan shall realistically assess project phasing considering the availability of state and local funding as well as the likelihood of Federal funding under the FAA's priority system
- A short term CIP that requires FDOT participation must be included in the JACIP/FDOT five year work program
- The Financial plan must identify the source of local funding
- An implementation plan to assure that needed facilities can be developed in a cost effective and timely manner
- A public participation program that actively promotes public knowledge and solicits public involvement in the airport master plan process
- Environmental and financial issues must be considered and permeated throughout the master planning process.

Specifically, these principal elements are included in defined chapters that typically comprise a standard master plan report. While some master planning efforts may utilize differing nomenclature to identify these chapters, all airport master plan studies will include the following: (Note that each of these chapters is discussed in detail in *Section II: Descriptions of Airport Master Plan Elements* of this guidebook.)

- Public Involvement Program
- Environmental Considerations
- Existing Conditions
- Aviation Forecasts
- Facility Requirements
- Development and Evaluation of Alternatives
- Airport Layout Plans (ALP)
- Facilities Implementation Plan
- Financial Feasibility Analysis

3. Need for Integration Among Planning Efforts

Airport planning is a diverse and dynamic discipline that can encompass all elements of aviation facilities and operations. Generally, planning efforts take the form of strategic-level aviation system planning, tactical-level airport master planning, and/or project-level planning initiatives. As such, it should be reasonably expected that airport planning with respect to a project, an airport, and/or a system is a continuing occurrence that should be coordinated and integrated in order to ensure that these efforts support each other in an efficient and effective manner.

In an idealized scenario, strategic-level planning should establish the overall vision and supporting policies for an effective airport system. Tactical-level planning should strive to implement those strategic level goals and policies. The project-level planning will support those overall airport goals with specific issues or facilities. Additionally, it should be noted that this planning integration should operate in both directions in that project level planning can and will influence the practicability of airport plans, which, in turn, will influence strategic system planning. What is most important to recognize is that all levels of airport planning play critical roles within their respective areas of analysis. Therefore, they must be thoughtfully integrated in order to ensure the overall success of those multi-layered planning initiatives.

An additional level of planning integration should occur with respect to local airport area planning efforts. This is of primary importance since FDOT has established some specific policy elements with respect the integration of planning efforts specifically related to airport master plans. Such planning elements may be inconsistent with the local government comprehensive plans. In such a situation, the capital improvement program (CIP) outlined within the airport master plan should be made consistent with the local government comprehensive plan and the state aviation system plan.

Projects in the CIP that may be 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. Those that do not adequately address the issue in the narrative will not be approved by FDOT. Additionally, any CIP that includes projects inconsistent with the local government comprehensive plan and proposes FDOT funding will not be considered financially feasible. As such, the sponsor will be required to remove FDOT funding from these projects in the CIP prior to FDOT approval of the airport master plan.

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 incorporate their airport master plans into their local governmental comprehensive plan. Note that in such an instance, aviation-related developments that have been addressed within the airport master plan would be exempt from the Development of Regional Impact (DRI) review standards outlined in Chapter 163 and 380 of the Florida Statutes.

C. INTENDED USERS – TAILORING STUDIES TO THE NEEDS OF INDIVIDUAL AIRPORTS

Airport master plans are generally intended for use by members of the aviation community. These interested parties include airport sponsors, airport staff, airport consultants, FAA representatives, and FDOT staff. Master planning documents have also proven to be invaluable to airport board members, municipal officials, state, regional, and local planning personnel at all levels, and to the public.

It is also important to recognize that such a wide diverse audience represents an equally diverse set of potential needs and requirements for the master planning documents. It is also reasonable to assume that these needs and requirements can differ dramatically depending on the location and associated local dynamics of the airport itself. As such, a "good" airport master plan must be customized to a degree in order to meet those often-unique local requirements. This customization is advocated and promoted as a means of producing an effective and appropriate master plan for the airport and for the state.

However, it should also be noted that while the tailoring of a master plan in response to local practicalities is advocated, the degree of that customization must also necessarily have some limits. While all airport master plans must encompass the primary elements of the planning effort noted previously, the degree to which customization and creativity can be interjected into the effort tends to be more subjective in nature. As suggested in a following section, customization and creativity in the master planning process will be permitted and promoted up to the point where that customization results in reduced efficiency in the development, approval, and use of the airport master planning effort, results, and products.

D. THE FLORIDA PHILOSOPHY OF AIRPORT MASTER PLANNING

The Florida Department of Transportation philosophy of airport master planning is encapsulated in the following statements:

- Emphasize computer-based airport master planning rather than traditional, paper-based approaches. Electronic deliverables to the airport manager should be anticipated for every airport master plan project.
- Only update the information in the master planning elements that require updating.
- The key product of every airport master plan project is an updated list of capital improvement projects ready for entry into the Joint Automated Capital Improvement Plan (JACIP).

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.

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. A typical example of the benefits of this approach would be a situation where a simple update to the capital improvement element of the master plan is required to make an unanticipated project eligible for state funding. 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 within several days. 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 by airport staff if those changes were simple.

Within this master planning philosophy, FDOT essentially views the individual planning elements as separate modules that can be added, deleted, and changed individually at any time. Thus, the airport master plan itself is not a static document, but in fact becomes a continuing, dynamic process that is always evolving and therefore always current.

E. STANDARDIZATION OF PRODUCTS NOT PLANNING

Every airport is a unique entity and serves a community with its own individual needs. Consequently, it is appropriate that airport sponsors approach the development of an airport master plan in an individualized fashion – one that fits their particular requirements. However, overly creative thinking and unique approaches to master planning, while providing a customized product for an airport, unfortunately cannot be standardized or automated, which can ultimately lead to inefficiencies and increased costs.

Specifically, the potential inefficiencies that can result from the lack of consistency in approach to work products are of particular concern, since multiple airport master planning efforts are conducted within Florida every year. It is important to understand that each one of these master planning projects must be managed by airport staff, designed by a consultant, and reviewed by FDOT and 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 creating planning approach will likely result in increased costs.

Therefore, it is anticipated that cost savings can be realized if master planning work products are standardized as proposed by this guidebook. A consistency of approach to products will afford 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.

F. TYPES OF AIRPORT MASTER PLANNING STUDIES

It is important that appropriate airport planning practices be established and maintained for airports within the state system in order for them to sustain their relevance and long-term viability. In general, airport planning can encompass a wide variety of studies and efforts, including 1) airport facility planning, 2) air capacity and system planning, 3) obstruction analyses, 4) financial planning, 5) traffic and markets, 6) economic and 7) environmental studies. It is generally recognized that there are three primary levels of airport planning:

- Strategic level planning examines long-term issues and determines how well various alternatives fit with identified goals and objectives. A strategic plan sets out procedures to follow which will lead to an optimal long-term set of objectives. The primary example of this level of airport planning is a state aviation system plan.
- Tactical-level planning determines short- and medium-term courses of action that best fit into overall strategic plans and goals. Additionally, tactical plans identify the best manner of carrying out these courses of actions. The primary example of this level of airport planning is that of an airport master plan.
- Project-level planning is the identification of a defined aspect of a tactical plan and the determination of the optimum manner of executing this aspect in project form. An example of this level of airport planning may be that of a terminal area plan.

It should be noted that airport planning could be an extremely complex process since an airport encompasses a wide range of activities that often have inherently different and conflicting requirements. As such, great care must be taken to ensure that these various activities and requirements are appropriately recognized and addressed to ensure their consistency and integration. There are several types of other airport plans or studies that are commonly conducted either directly in conjunction with or separately from the airport master planning process that directly address these specific requirements. Some of those most common planning studies or plans are briefly described below.

1. 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 the extent, type, nature, location, and timing of airport development needed to establish a viable, balanced, and integrated system of airports. It also provides the structural basis for more detailed airport planning such as that contained in an airport master plan.

FDOT has the benefit of having completed the 2005 Florida Aviation System Plan (FASP) in cooperation with the FAA and Florida's Public Airports. The FASP updated the Continuing Florida Aviation System Planning Process (CFASPP). The system plan incorporates the traditional aviation system planning elements provided for in most state aviation system plans. However, the FASP 2025 includes an analysis of the intermodal aspects of the state transportation system. In addition, it included a Strategic Planning element, which identifies seven strategic goals as well as the approaches, measurements and recommendations to achieve these goals. This update to the system plan also includes the development of a statewide aviation database, called the Florida Aviation Database (FAD).

The FASP also provides documentation of airports and related facilities needed to meet current and future statewide aviation demands. In order for planned 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.

2. Terminal Area Plans

The principal focus of terminal area planning is the interface between landside and airside operations for aircraft passengers. This can be for commercial service of general aviation facilities. In either case, the primary objective of a terminal area plan is typically to achieve an appropriate balance of accessibility, passenger convenience, operating efficiency, facility investment, and aesthetics. Specific factors for consideration within a terminal area plan commonly include the following:

- Terminal area geometries
- Passenger flow
- Passenger vehicles flow
- Airport administration
- Aircraft operations
- Safety and security
- Financial viability
- Capacity

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 master plan. As such, these efforts must be suitably integrated.

3. Airport Access Plans

An airport ground access plan can include any element that an aircraft passenger and/or cargo shipment could encounter from the airside/terminal area to the transportation infrastructure network outside the airport. All modes of transportation can be considered, including roadways/highways, railways, taxis/limousines, buses, rapid transit, waterborne modes, helicopter links, etc. 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 will often be more general and strategic in nature. This is largely due to the potential coordination efforts that would be required with local and regional transportation agencies, highway departments, transit authorities, comprehensive planning bodies, etc.

Regardless of their general nature, airport access plans can have an immediate and significant impact on the master planning 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.

4. 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 also involve concessions and properties as well as financing large capital projects. All of these plans could have significant impacts on an airport operation due to their potential to influence that airport's operations 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

planning element with any other relevant financial plans is essential to ensure that the results of the master plan are financially practicable.

5. 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 (as noted above and described in a later section), 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. Generally, it is incumbent upon the airport to work to maximize the compatibility between its operations and the surrounding uses and activities, including through minimization of potential noise impacts and environmental conflicts, and through establishment of appropriate zoning, overlay districts, and regulations. However, by its very nature, off-airport planning must be accomplished through extensive coordination with local and state governments, local and regional planning agencies, the local populace, and other interested stakeholders. This process can be very involved and complex. Any land-use plan that has undertaken such an effort must be acknowledged and considered. As such, 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.

G. PRODUCTS OF THE MASTER PLANNING PROCESS

The products of the master planning process will vary with the complexity of the effort. However, most master plans will include the following deliverables. (Note that these deliverables are described in detail in *Section II: Descriptions of Airport Master Plan Elements* of this guidebook.)

1. Master Plan Document

The overall master plan document will contain the primary technical report that reflects the results of the analyses conducted during the development of the master plan. For complex studies, interim reports could be produced to facilitate coordination with various government agencies, tenants, users, the public, and other interested parties. At the conclusion of the study, any interim reports are assembled into the final technical report. Additionally, a summary report is often useful in bringing together pertinent facts, conclusions, and recommendations for public review. Such a report is an excellent place to highlight the economic benefits that flow from the airport to the communities it serves.

2. Airport Layout Plans

Other than the overall document itself, the ultimate work product of an airport master plan effort is the Airport Layout Plan (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. While this plan set can vary in the number and types of sheets included depending on the complexity and requirements of the airport, the principle sheet of the set is the actual ALP sheet itself. The ALP sheet is a legally binding document that is signed by the airport sponsor and the FAA.

3. Capital Improvement Program Projects List

The Capital Improvement Program (CIP) includes all projects proposed as part of the airport master planning effort, including those not eligible for Federal and state funding. The CIP 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 Plan (JACIP), which is used to program airport development grants. Included in the overall list of capital projects are some that are ineligible for Federal and state funding such as maintenance, building repair, and development of revenue-producing projects. Regardless of the terms used, the facilities implementation plan within the airport master plan must address all capital projects (even those projects that are not associated with the recommendations of the master plan) to ensure that adequate fiscal, staff, scheduling, and other resources are available. In addition, all documentation should be prepared so that it will be clearly understood by all parties.

4. Digital and Hard Copies of Planning Documents

As stated previously, FDOT is committed to producing master planning work products that are proper, useful, and reflect the current state of the industry in terms of process and technology. Therefore, beyond the standard paper deliverables of the master plan technical report and ALP, electronic copies of all deliverables must be delivered in appropriate formats for future use. At the discretion of the project sponsors, such 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. However, as noted above, the key product of every airport master plan project is an updated list of capital improvement projects ready for entry into the JACIP, which is used to program airport development grants.

H. SUMMARY OF FDOT AND FAA MASTER PLAN STANDARDS

The airport master planning standards utilized and advocated within this book are consistent with the current state of the aviation planning industry. Several specific FAA guidelines for the basis of master planning; however, FDOT adds procedures as presented in this document. The following is a listing of the specific standards utilized within this guidebook.

1. FDOT Topic No. 725-040-100-f – Airport Master Plans

This procedure guides FDOT participation in the preparation, funding, review, and approval of airport master plans prepared by local airport sponsors. It is designed for all FDOT personnel who are authorized to review, comment, and implement master plan development through the aviation work program. Its authority originates from Florida Statutes (FS) Chapter 332, Sections 20.23(3)(a) and FS Chapter 334.038(3).

2. FAA AC 150/5300-13 – Airport Design

This advisory circular contains the airport design standards and recommendations as formulated by the FAA for use in the design of civil airports, and forms the basis of the industry's aviation design standards. For airport projects receiving Federal grant assistance, the use of these standards is mandatory. At certificated airports, the standards and recommendations may be used to satisfy specific requirements of Federal Aviation Regulations (FAR).

3. FAA AC 150/5070-6 – Airport Master Plans

This Advisory Circular (AC) contains the FAA standards and guidance for the preparation of master plans for airports that range in size and function from small general aviation to large commercial service facilities. This AC is designed to foster a flexible approach to master planning that directs attention and resources to critical issues through tailoring of the plans to the individual airports under evaluation. The AC forms the basis of the industry's standards for the preparation of airport master plans and serves as the foundation of the FDOT guidelines.

I. INITIAL NEEDS DETERMINATION

As suggested previously, every airport master plan should be considered a unique entity with a scope of work tailored to the individual airport for which the plan is being prepared. This is done to focus the study directly on the specific needs and goals of that particular airport. As such, in order to design a master plan study to address appropriately the particular requirements and areas of interest of an airport, an initial needs determination process must be undertaken to establish formally the overall project need, as well as the ultimate form of that planning project.

1. Identifying General Need for Study

Typically, an airport owner/sponsor will be the primary entity that will identify the need to undertake an airport master planning effort. Master plans are generally prepared to support modernization and/or expansion of existing airports. Often, the basis of the master plan need will be airport capacity and/or other facility deficiencies that result from demand exceeding capacity, the introduction of new aircraft types, or of a critical environmental problem. While airport master plans should ideally be updated every five years, they typically are undertaken at longer incremental periods. This sometimes leads to situations where an airport's master plan of record becomes obsolete as the goals, circumstances, and assumptions upon which that plan was based may have changed or evolved since its adoption.

Other potential considerations that could drive a planning effort include the modification of the airport owner/sponsor's strategic vision/business plan, or addressing new issues identified in national, state, or regional plans. Additionally, airport users, such as general aviation pilots or scheduled airlines, may have identified other important needs that prompt the airport sponsor to undertake a study. In any case, the airport sponsor should formulate priorities to establish which needs are most important. Note that periodic meetings between the airport sponsor and FDOT/FAA representatives will typically offer an excellent opportunity to review potential needs.

Generally, for the airport sponsor, the initial step for determining the need for a new master planning effort should begin with comparing the most recent airport plans, studies and projections to current operational trends and needs. In essence, the sponsor must ask the question, "does the airport's most recent planning documentation reasonably reflect the airport's current condition and goals?" It may be that existing airport plans no longer reflect the needs of airport users. Alternatively, it may be that specific components of the plan (e.g. land-use compatibility with surrounding communities) do not reflect current airport policy requirements. Role changes driven by more recent statewide airport system planning efforts may no longer be accurately reflected in a previous airport master plan, or possibly the recommendations of the previous plan may have been fully implemented. In any case, the airport sponsor should undertake a comprehensive effort to indentify all relevant needs for the airport.

2. Determining Type of Study

The master planning process can vary greatly with the size, complexity, and role of the study airport, and could include a wide variety of supporting studies. As such, Figure I-1 has been provided below to assist airport owners/sponsors in assessing what may be required in terms of master planning effort based on a common set of circumstances. (Please note that the listing of project needs reflected in that figure is not intended to be comprehensive.) Also, recognize that the airport sponsor usually will not make final decisions regarding specific variations on the basic study type until the consultant has been selected and the scoping process has begun. Regardless, it can be stated that master planning studies generally fall within one of two basic types: Airport Master Plans or Airport Layout (ALP) Updates.

AIRPORT MASTER PLANS

An airport master plan is a comprehensive airport study that typically describes short-, medium-, and long-term plans for airport development. It is important to note that master planning efforts which address major revisions to the airport are commonly referred to as simply "master plans," while those planning efforts that change only parts of the existing master plan document and/or require a relatively low level of effort, tend to be known as "master plan updates." Commonly, the distinction refers to the relative levels of effort and detail of master planning studies.

A master plan study will always include a technical report and an airport layout plan drawing set, in addition to any supplemental work products, many of which are often related to public outreach efforts. In terms of elements of the technical report, an airport master plan should contain those discussed in detail in *Section II: Descriptions of Airport Master Plan Elements* of this guidebook.

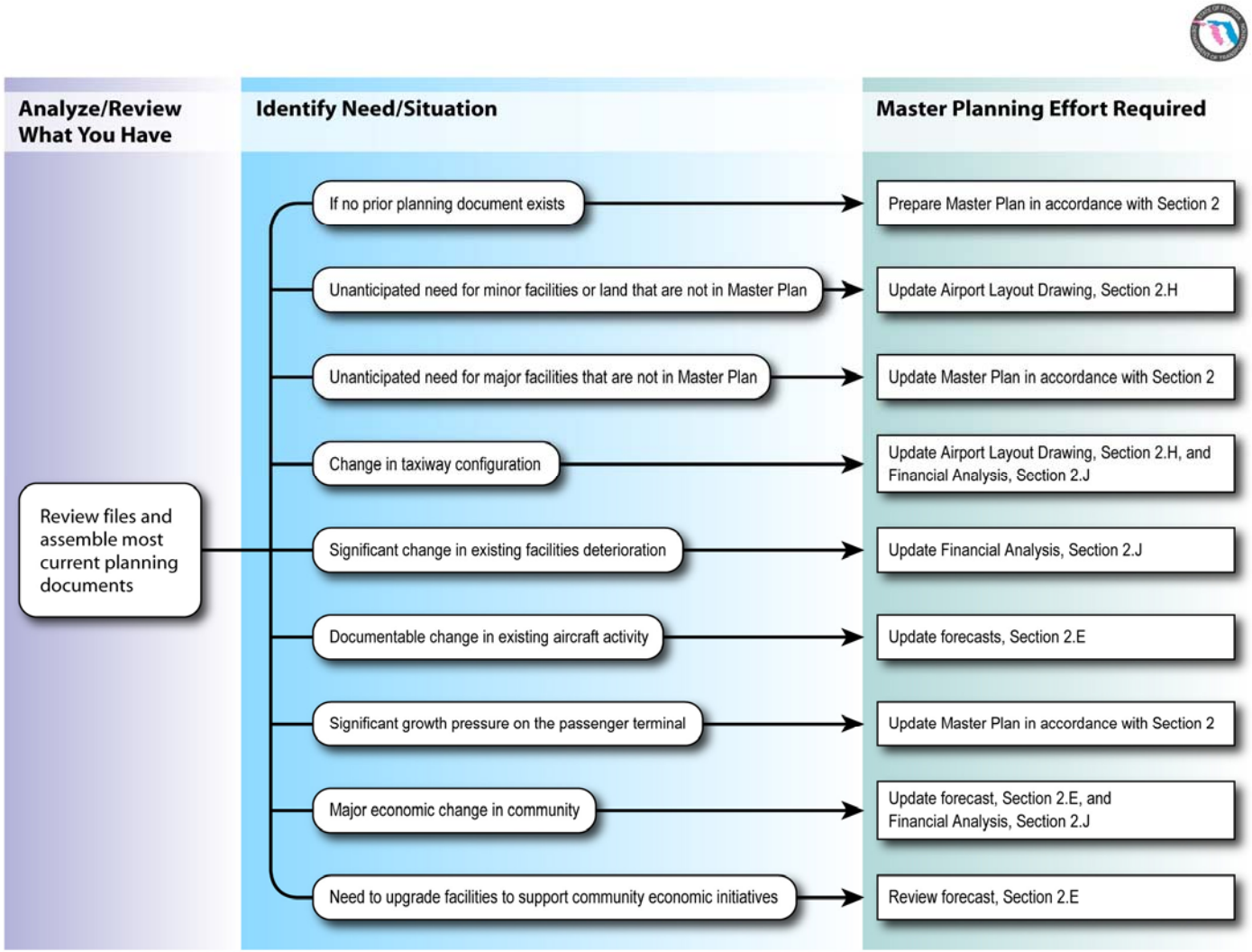
AIRPORT LAYOUT PLAN UPDATES

An update of the ALP drawing set is a principle work product of all airport master plan efforts in that maintaining a current ALP is a legal requirement for any airport that receives Federal assistance. In terms of a master planning study and the associated level of effort required to address particular issues, an ALP drawing set 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 to any significant degree. Additionally, answering specific questions related to a single development item (e.g. runway safety area improvements) may also only require an ALP update.

Typically, an ALP update will involve fewer elements than that of a full master plan study, but will include the following: (Note that if additional steps are required to complete the ALP update, a full master plan study is likely more appropriate.)

- 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

Figure I-1
AVIATION PLANNING DECISION TREE



J. PRE-PLANNING

Once the initial determination is made that an airport master plan is needed and what form that planning effort will take, the pre-planning element of the master planning process can proceed. Since every airport master plan is unique, this pre-planning process is critical for defining those qualities that are distinctive to a particular study. Encompassed in the pre-planning is the selection of a planning consultant, the identification of specific project goals and objectives, as well as other pre-scoping coordination efforts.

1. Qualifications and Consultant Selection

As a general practice, airport owners/sponsors hire professional airport consultants to prepare most airport planning studies. The current version of FAA AC 150/5100-14, *Architectural, Engineering and Planning Consultant Services for Airport Grant Projects*, as well as *Guidelines to Selecting Airport Consultants*, published by the Airport Consultants Council both provide excellent guidance for consultant selection, and their use is recommended.

However, before soliciting statements of qualifications (SOQ) or issuing a request for proposals (RFPs) from consultants, the airport owner/sponsor should have a clear understanding of the issues that define the need for the study (described in the previous section). This information should be provided in the RFQ or RFP that the airport sponsor ultimately issues.

As part of the consultant solicitation process, the owner/sponsor should assemble an unbiased and technically qualified selection panel to conduct the consultant selection. The qualifications of a submitting firm or team of firms should be judged on its experience in similar work, its staff's professional credentials and their ability to complete the study within the time specified. Understand that it is common for several firms to team in a master planning effort to provide specialized skills or local knowledge and expertise.

Note that the owner/sponsor should avoid the use of elaborate submittal requirements or interviews, which add substantially to the cost of the selection process for both the sponsor and the prospective consultants. If the sponsor determines that interviews or requests for additional information are necessary, the sponsor should limit this activity to a short list of three to five firms selected by the evaluation panel.

2. Goals and Objectives

An important step in setting the stage for the development of an appropriate project scope of work is the identification of project goals and objectives. Generally understood to be part of scoping, this is an important step in designing any planning study and begins with the airport owner/sponsor, the consultant, the FDOT, the FAA, and others (as appropriate) identifying the key airport development issues to be addressed in the master plan. Those issues then form the basis for the identification of the goals and objectives for the overall master planning effort. Additionally, all other special issues that the planning study is intended to resolve should then be identified. This step will not only be a key to the project justification, it will also help keep the project on track and allow an evaluation of success during its final stages.

Note that as part of this goal setting process, the airport owner/sponsor should utilize multiple means in identifying critical airport issues for consideration within a master planning effort. These other means often include the following:

- Meetings with project stakeholders to understand issues – coordinating with all appropriate interested stakeholders are the most effective manner of establishing the breadth and detail of potential airport issues.

- Site visits – actual visits to the airport by the project stakeholders provide a first-hand look at the current airport situation and can lend perspective to stakeholder opinions.
- Retrieving and analyzing historical and electronic documents – utilizing other planning documents (e.g. Florida Aviation System Plan, historical master plans, municipal comprehensive plans, etc.) can provide insight into potential airport issues from both historical and alternative perspectives.

Note that once the project goals and objectives process is completed, scoping will continue through determining the types of analyses and level of effort needed to address each issue individually. This is discussed in detail in the following section.

K. SCOPING PROCESS AND EFFORT

Careful attention to the development of a detailed master plan scope of work will ultimately set the stage for a successful study. Establishing a sound scope of work that accurately reflects all of the goals, issues, and objectives identified in the pre-planning process will provide the project sponsor, consultant, FDOT, and the FAA with not only a clear understanding of project expectations, but it will also allow them to develop an appropriate budget that meets those project goals and objectives. Failure to do so may result in a study that lacks vital details required to influence the decision making process desired through the master plan effort. The following provides detail on some of the key elements and considerations of the scoping process.

1. Data Availability

Existing current inventory data for the airport may be available to the consultant because of other planning efforts by the airport owner/sponsor, FDOT and/or the FAA. Use of this data may reduce the need for new information collection efforts or surveys by the consultant. Additional sources include previous master plans, associated environmental documentation, local government comprehensive plans, FDOT forecasting information, previous ALP's, community development planning documents, etc. Note that even if some documents may be dated, they may be of assistance in developing accurate scopes of work and associated cost estimates. Use of other data sources will also assist in the identification of existing critical issues, such as the presence of threatened/endangered species, wetlands, local comprehensive planning levels of service, noise sensitive and non-compatible land-use issues, and other areas of public and environmental sensitivity.

Of particular consideration, current airport activity forecasts and capacity assessments from other planning resources (i.e. other master planning studies, state and regional system plans, and the FAA) should always be reviewed and their potential applicability to the proposed planning effort established. If these forecasts are not utilized, the rationale should be discussed with and accepted by all relevant stakeholders, including the FAA who must ultimately approve any forecasts resulting from the master plan.

2. Forecast Horizons

Standard forecasting horizons for master planning efforts typically include 5-, 10-, and 20-year periods, which respectively reflect short-, medium-, and long-term forecasts. It is important that the short-term forecast support several key elements of the master plan, including the Capital Improvement Program (CIP), the medium-term should address a realistic assessment of needs, and the long-term, concept-oriented statement of needs. For those medium and long-term forecasts, proposed airport development directly related to forecast demand levels should be directly tied to those demand levels rather than to dates, since the accuracy of forecasts will typically decline as time periods increase. Note that those airports pursuing a planning horizon beyond the 20 years, must justify the reason and the purpose must be clearly defined (e.g. protection of the airport from incompatible land-use development).

3. Environmental Considerations

It is critical to the long-term success of the master plan that the environmental documentation anticipated to be required in order to pursue the master plan's ultimate recommendations be identified early in the process. Airport sponsors should consult with appropriate FDOT and FAA representatives to assess if a project can be categorically excluded or whether an Environmental Assessment (EA) or Environmental Impact Statement (EIS) may be required. The potential impact

of environmental requirements on a master plan's resulting project practicability, schedules, costs, etc., cannot be underestimated.

4. Schedules

The development of a realistic project schedule is significant in that it should establish hard deadlines for meeting planning process milestones, including timelines for the completion of technical products, for conducting coordination efforts, and for formally establishing 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.

5. 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 paper reports, drawings, and electronic files.

6. Coordination and Public Involvement Program

The complexity of the coordination and public involvement program associated with an airport master plan tends to vary directly with the complexity of the plan itself. Less complex studies may only require the active participation of the airport owner/sponsor, the FDOT, and the FAA as long as they coordinate with appropriate local officials and stakeholders, and that appropriate citizen participation through public information sessions is promoted. Studies that are more complex may also require the employment of formal policy, technical, and review committees that meet regularly and use structured communications systems (e.g. public hearings, public information workshops or web-based information sharing tools). Often committee membership consists of representatives of local, state, and Federal government agencies, as well as airport tenants, user groups, community associations, and business organizations. Ultimately, it is at the discretion of the airport sponsor and the primary stakeholders to design a coordination and public involvement program that is appropriate for their airport master plan effort.

7. Budget

Typically, the development of a master plan work scope and its associated costs is an iterative process that weighs the desires of the project sponsor for specific work products against the practicalities of financial limitations. Early draft work scopes will often exceed a sponsor's budget, at which point the consultant must modify the scope of work and/or the proposed fees, or the available budget is adjusted. This process may be repeated until all three components have been balanced to the satisfaction of the sponsor, the consultant, FDOT, and the FAA.

It is important to note that Federal planning grants cannot be amended to cover increased project costs. If further work were needed beyond the original scope of work, an additional grant would likely be required. Many of the decisions made at this point will have an impact on the degree of difficulty that is encountered as the development program moves from planning to implementation. As such, close attention to the balance between scope, fees, and budget must be given in order to set the stage for a successful study, allowing the primary project stakeholders to develop a budget that meets the goals and objectives of the study. Failure to do so could result in a master planning effort that lacks vital details affecting the ultimate decision making process.

8. Application for Federal and State Funding

The FAA and FDOT make planning grants available to airport owners/sponsors for airport planning studies. Due to budget constraints, 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. Recommended steps to be taken in order to pursue and initiate a master planning project are as follows:

STEP 1: DETERMINE IF A NEW AIRPORT PLANNING PROJECT IS NEEDED AND JUSTIFIED

See Section I.I, *Initial Needs Determination,* above.

STEP 2: DEFINE THE GOALS AND SPECIAL ISSUES ASSOCIATED WITH THE PROPOSED PLANNING PROJECT

See Section I.J, *Pre-Planning,* above.

STEP 3: SCHEDULE PROJECT JUSTIFICATION AND SCOPE MEETING WITH THE FDOT DISTRICT OFFICE AND FAA (OPTIONAL)

If Federal funds are being requested as part of this master planning effort, the airport owner/sponsor should schedule a meeting with the FDOT district representative and the FAA, at which, the justification for the project, its goals and any special planning issues that the study is anticipated to address should be discussed. This coordination will allow the owner/sponsor, the FDOT district office, and the FAA to work as a team to verify the justification, and outline a preliminary scope of work specific to the defined project needs and the characteristics of the airport. A generalized budget range and project schedule should also be discussed at this meeting. Contact Information for FDOT representatives can be found in Figure I-2.

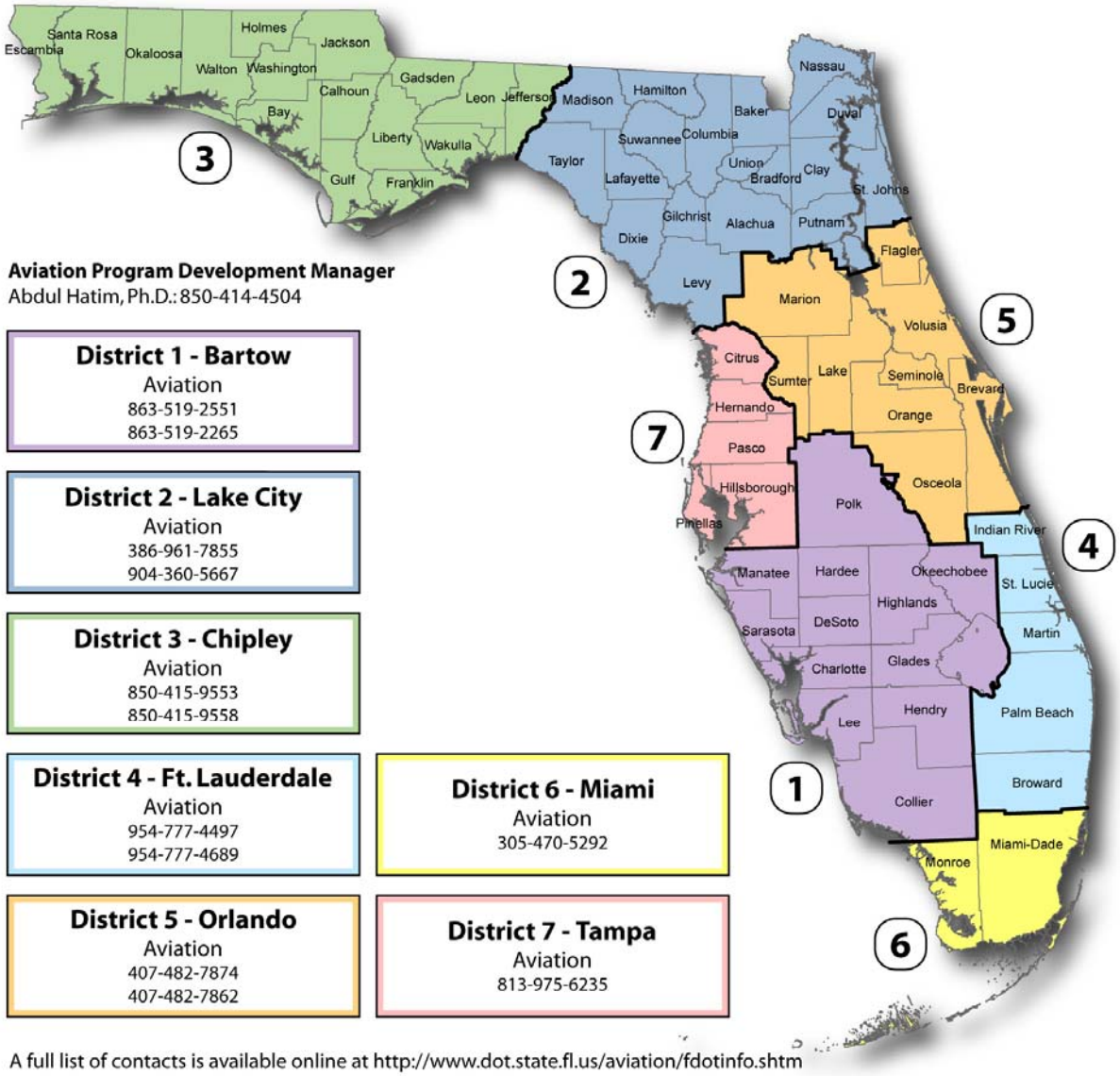


Figure I-2
FDOT AVIATION OFFICE CONTACT INFORMATION

STEP 4: REQUESTING FUNDING FROM FAA AND FDOT

In order to secure project funding formally, the airport owner/sponsor must specifically request an appropriation during the regular Joint Automated Capital Improvement Plan (JACIP) process meetings, attended annually by airports, the FAA and the FDOT. Note that both the FAA (Orlando ADO) and the FDOT Aviation Office have adopted this mechanism as the official method by which funding requests for either agency are made. (See *Part II, Section L – JACIP Input Programming* of this guidebook for additional information regarding the JACIP process.) Complete instructions for using JACIP software are available from either the FDOT or the FAA ADO. The following items should be specifically included in the request and justification:

- Statement of project needs, goals and objectives, and special issues
- Scope of Work
- Project Schedule
- Detailed cost estimates and requested fund sources

STEP 5: ISSUANCE OF THE PLANNING GRANT(S)

Available funding will be issued to the airport in the form of a planning grant from the FAA or a Joint Participation Agreement (JPA) from the FDOT. Once the owner/sponsor has received and executed the necessary contracts to receive the funding, a Notice to Proceed (NTP) will be given to the airport by the funding agency or agencies. It is important to note that any work performed prior to receipt of a NTP is not normally eligible for reimbursement from either the FDOT or the FAA.

STEP 6: MONITOR PROJECT PERFORMANCE

As stated previously, the scope of work for the master planning project should define specific deliverable products for each element along with a proper schedule for delivery. These deliverables should be physical results of the work such as electronic databases, draft analyses, and recommendations or drawings rather than simply descriptions of work completed during the previous month. Keying on product deliverables is a very accurate means of tracking both the progress and the quality of project performance.

STEP 7: REVIEW AND APPROVE OR REQUEST CORRECTION OF PROJECT PRODUCTS

The airport staff should promptly and thoroughly review all deliverables and identify any discrepancies to the consultant. A copy of deliverables should also be forwarded to the FDOT district office and FAA, as required, for their review and comments.

STEP 8: PROCESS PROJECT INVOICES BASED ON ACCEPTANCE OF PROJECT DELIVERABLES

Consultant payments for work completed should be based on an apportioned lump sum agreement, rather than cost plus fixed fee or monthly progress payments over the life of the project. This type of lump sum agreement apportions the contract cost to the deliverable products. Project invoices should be promptly paid after the airport staff and the FDOT district staff has approved the appropriate deliverable product.

STEP 9: FINAL PROJECT ACCEPTANCE AND CLOSEOUT

Upon completion of the final deliverable product, a request should be made for FDOT and FAA final approvals. After approval of the final project deliverable products, the airport sponsor should

request an official project closeout from the FDOT district office and the FAA (if Federal funds were used in the project).

STEP 10: IMPLEMENTATION OF THE PLAN.
See Part II, Sections L and M of this guidebook for additional information regarding funding and building new airport facilities as proposed by the completed airport master plan.

L. ON-LINE RESOURCES AND UPDATED REFERENCE MATERIAL

There are a number of resources and reference material available to the airport planner. Several are referenced in this section. They include FAA Advisory Circulars (AC), Florida Statutes, Florida Administrative Code (FAC) Rules, and other State of Florida and FDOT regulations, procedures, and publications. Web addresses and abstracts of the materials listed in this section can be found in Appendix G.

1. FAA Advisory Circulars

- FAA AC 150/5020-1, *Noise Control and Compatibility for Airports*
- FAA AC 150/5050-4, *Citizen Participation in Airport Planning*
- FAA AC 150/5060-5, *Airport Capacity and Delay*
- FAA AC 150/5070-6, *Airport Master Plans*
- FAA AC 150/5070-7, *The Airport System Planning Process*
- FAA AC 150/5100-14, *Architectural, Engineering and Planning Consulting Services for Airport Grant Projects*
- FAA AC 150/5190-4, *A Model Zoning Ordinance to Limit Heights of Objects Around Airports*
- FAA AC 150/5200-33, *Hazardous Wildlife Attractants On or Near Public Airports*
- FAA AC 150/5300-13, *Airport Design*
- FAA AC 150/5300-16, *General Guidance and Specifications for Aeronautical Surveys: Establishment of Geodetic Control and Submission to the National Geodetic Survey (NGS)*
- FAA AC 150/5300-17, *General Guidance and Specifications for Aeronautical Survey Airport Imagery and Submission to the NGS*
- FAA AC 150/5300-18, *Geographic Information System (GIS) Standards*
- FAA AC 150/5325-4, *Runway Length Requirements for Airport Design*
- FAA AC 150/5360-9, *Planning and Design of Airport Terminal Facilities at Non-Hub Locations*
- FAA AC 150/5360-13, *Planning and Design Guidelines for Airport Terminal Facilities*
- FAA AC 150/5390-2, *Heliport Design*
- FAA AC 150/5390-3, *Vertiport Design*
- FAA AC 150/5395-1, *Seaplane Bases*

2. Florida Statutes

- Chapter 163, *Intergovernmental Programs*
- Chapter 186, *State and Regional Planning*
- Chapter 330, *Regulation of Aircraft, Pilots, and Airports*
- Chapter 331, *Aviation and Aerospace Facilities and Commerce*
- Chapter 332, *Airports and Other Navigation Facilities*
- Chapter 333, *Airport Zoning*
- Chapter 339, *Transportation Finance and Planning*
- Chapter 341.053*, Administration of the Intermodal Development Program*
- Chapter 380*, Land and Water Management*

3. Florida Administrative Codes

- Rule 9J-2, *Rules of Procedure and Practice Pertaining to Developments of Regional Impact*
- Rule 9J-5, *Minimum Criteria for Review of Local Government Comprehensive Plans and Plan Amendments, Evaluation and Appraisal Reports, Land Development Regulations and Determinations of Compliance*
- Rule 9J-11, *Governing Procedure for the Submittal and Review of Local Government Comprehensive Plans and Amendments*
- Rule 14-60, *Airport Licensing, Registration, and Airspace Protection*
- Rule 28-24, *Land Planning – Part II Developments Presumed to be of Regional Impact*

4. FDOT Policies and Publications

- FDOT Topic No. 725-040-040-h, *Aviation Program Management*
- FDOT Topic No. 725-040-055-b, *Loans to Airports*
- FDOT Topic No. 725-040-060-d, *Airport Economic Development Program*
- FDOT Topic No. 725-040-100-f, *Airport Master Plans*
- FDOT Topic No. 725-040-210-d, *New Public Airport Funding Eligibility*
- *Florida's Strategic Intermodal System Plan*
- *Florida Aviation System Plan*
- *Florida Airport Financial Resource Guide*
- *Florida Aviation Project Handbook*
- *Airport Compatible Land Use Guidance for Florida Communities*
- *Policies and Procedures – Airport Economic Development Program*

II. DESCRIPTIONS OF AIRPORT MASTER PLAN ELEMENTS

A. MASTER PLAN WORK ELEMENTS

FAA Advisory Circular (AC) 150/5070-6, Airport Master Plans, provides detailed guidance for the development of Airport Master Plans. The FAA master planning effort consists of various work elements. This guidebook serves to provide a more detailed and specific focus for the state of Florida and the Florida Department of Transportation (FDOT).

The master planning work elements vary depending on individual airport characteristics, as well as unique issues. Unique issues may require airport owners/sponsors to tailor master planning efforts to address specific circumstances that fall outside the scope of this document. However, Table II-1 has been developed to provide general guidance for determining desirable planning tools based on basic airport characteristics and provides a starting point from which an owner/sponsor can evaluate unique issues and conclude what planning tools will be essential for proper proactive planning. From this analysis, insignificant/nonessential elements can be eliminated from the master planning process.

The potential master planning work elements are outlined below along with brief descriptions of the resulting deliverables. More detail regarding each work element and the corresponding deliverable is provided in the remainder of this section.

1. Public Involvement Program

The purpose of a Public Involvement Program is to encourage information sharing and collaboration between the airport sponsor and the stakeholders. Each stakeholder has an interest in the outcome of the study. Early opportunities to comment, before major decisions have been made, are essential to an effective Public Involvement Program. Note the FAA requires some degree of public participation or input.

2. Environmental Considerations

While not intended to provide the detail of a categorical exclusion (CATEX), a formal environmental assessment (EA), or environmental impact statement (EIS), the environmental overview provides a summary of potential environmental impacts and mitigation opportunities associated with the selected airport improvement plan. It is essential that environmental issues be considered for each project being discussed.

3. Existing Conditions

The creation of an inventory database is normally one of the first tasks accomplished within the airport master planning effort. The purpose is to gather and assemble information about the airport, its service area, adjoining communities, the facility itself, and any other pertinent issues. The inventory database is then referred to throughout the study as questions arise about facilities and conditions. Further information can be found in Appendix D, *Checklists.*

Table II-1

TYPICAL MASTER PLAN DELIVERABLES

Airport Reference Code	Runway Length in Feet	Number of Based Aircraft	Instrument Approach Category	FASP[1] Service Level	Airport Role	Narrative Summary	Narrative Report	Airport Layout Plan	Terminal Area Plan	Inner Portion of the Approach Surface	Airport Airspace Drawing	Airport Property Map	Land Use Drawing	Airport Community Land Use Compatibility Drawing	Airport Access Drawing	Airport Database
A-I	2,500	10+	Visual	General Aviation	Basic Utility											
B-II	4,000	25+	Visual/Non-Precision		General Utility											
D-II	5,500	50+	Non-Precision/ Precision		Transport											
D-II	5,500	75+	Precision	Reliever	Transport											
D-III	6,500 and greater	N/A	Precision	Commercial[2]	Passenger Transport											
D-IV	8,000 and greater	N/A	Precision	Primary[3] Commercial	Passenger Transport											

Legend

Needed Optional Not Needed

1. Florida Aviation System Plan
2. Commercial – An Airport with scheduled passenger service that enplanes at least 2,500 passengers annually
3. Primary Commercial – An airport with scheduled passenger service that enplanes 0.01 percent or more of the total number of passengers enplaned annually at all commercial service airports

4. Aviation Activity Forecasts

Previous aviation activity, local socioeconomic data, and other information collected during the inventory process are used as a basis for establishing aviation forecasts. The forecasts consider a 20-year planning period and are produced for the short-, medium, and long-term planning horizons. These periods typically equate to key phases of 0-5 years, 6-10 years, and 11-20 years. The forecasts provide a probable level of demand that the airport should plan to accommodate over future years. Sources of available data for these forecasts can be found in Section II.E.7 of this Guidebook.

The FAA must approve the forecast immediately upon completion of the forecasting effort. If the forecast differs from the FAA Terminal Area Forecast by more than 10 percent in the initial five-year forecast period, and 15 percent in the 10-year forecast period, additional information that justifies the discrepancy must be provided to the FAA before the forecasts will be approved.

5. Facility Requirements

This element evaluates the ability of various existing airport facilities to meet the anticipated demand for future facilities. This results in a demand/capacity relationship that identifies the need for additional facilities to accommodate future activity.

The infrastructure and associated needs of the airport are also judged for their ability to accommodate the aviation forecasts. The master plan will identify changes necessary to cope with increased demand, change in function, outdated infrastructure and/or outdated information. Some airport facility needs are justified based on design standards as opposed to a direct demand/capacity relationship. For example, while the number of peak-hour transient aircraft parking spaces needed in the future can be determined by comparing the present number of parking spaces with the forecast of peak-hour transient aircraft, other facilities such as NAVAIDs and lighting are based on design standard justification. These types of facilities issues are considered during the facility requirements evaluation.

Detailed information on FAA design standards can be found in FAA AC 150/5300-13, *Airport Design.* In the development of facility requirements, the FAA model, Airport Design (for microcomputers) can be obtained and used. This model is described in Appendix 11 of FAA AC 150/5300-13, *Airport Design*.

6. Development and Evaluation of Alternatives

Alternatives are identified and developed to meet the projected facility requirements for each of the key elements of the airport. The alternatives for each element of the airport are combined in various ways to produce airport development alternatives. The determination of the best airport development alternative is made by conducting an evaluation that considers a wide range of criteria, including operational, environmental, and financial impacts. A recommended airport development alternative will be the result of the evaluation.

7. Airport Layout Plans

The Airport Layout Plan set provides a graphic representation of the existing facilities and the long-term development plan for an airport. The primary drawing of the set is the Airport Layout Plan, which is developed in accordance with FAA standards. Depending on the size and complexity of the airport, additional drawings may be appended to the Airport Layout Plan and included in the set. Typical drawings may include:

- Cover Sheet
- Airport Layout Plan
- Airport Airspace Drawing
- Inner Portion of the Approach Surface Drawing
- Terminal Area Plan
- Land-Use Drawing
- Airport Property Map

8. Facilities Implementation Plan

The Facilities Implementation Plan is a summary description of each of the Capital Improvement Program (CIP) projects and the associated costs that make up the recommended airport development alternative. Improvements are scheduled over the planning period based largely on the levels of demand that are projected to trigger the need for expansion of each of the component elements. The CIP schedule is usually developed in five-year increments, with a breakdown of projects and costs on a yearly basis for the first five years.

9. Financial Analysis

Financial analysis is the establishment of a financial plan for the airport to fund the Capital Improvement Program. The financial analysis can consider costs and revenues associated with the CIP, as well as airport operating and maintenance costs.

10. Deliverables

As indicated by Table II-1, the master planning deliverables consist of documentation of the process through combination of a narrative, drawings, an electronic database, and other contract deliverables. Select deliverable items include:

NARRATIVE SUMMARY/REPORT
A narrative summary is recommended for basic utility airports. This summary contains approximately 10 to 20 pages and explains the reasoning for important features of the airport layout drawing, as well as any other drawings. An abbreviated narrative report is recommended for other basic utility airports and all general utility airports. This report contains between 50 and 100 pages and addresses each element analyzed. A full narrative report is recommended for general aviation transport, reliever, and commercial passenger airports. This report contains approximately 100 to 200 pages and addresses each element analyzed.

The narrative summary/report is organized in the same sequence as the work is executed; in the order presented in this section.

ELECTRONIC DATABASE AND OTHER CONTRACT DELIVERABLES
Various collected and analyzed data formatted in accordance with Appendix E should be provided to the airport sponsor in electronic format. All deliverables should be accompanied by electronic versions of the deliverable. This may include all narrative text, graphics, modeling, AutoCAD, spreadsheets, and GIS data in software formats specified in the Scope of Work; i.e., Microsoft Word or Excel, AutoCAD, FoxPro, etc. The preferred final deliverable media for the consolidated information is the CD-Rom. This requirement should be included in all Scopes of Work.

B. PUBLIC INVOLVEMENT PROGRAM

The Florida Department of Transportation's position on Public Involvement Programs is summed up in FDOT Topic No. 000-525-050-e, *Public Involvement Opportunities*, which 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 exchange information activities in all functional areas using various techniques adapted to local area conditions and project requirements.

The establishment of a Public Involvement Program within an Airport Master Plan study is very important not only to the FDOT, but to the success of the master plan itself. The public is defined as anyone who has an interest in the airport whether it is as a user, tenant, employee, the FAA, other governmental agencies, elected and appointed officials, residents of the community, or passengers. Together these individuals and groups are the stakeholders. The level of their involvement will depend on the complexity of the master plan study and the level of interest the public has in the issues to be addressed. Most planning studies will fall between the minimal requirements of a small airport planning study with limited public involvement and that of a large complex study that may require extensive public involvement.

1. Timing

The earlier a Public Involvement Program is initiated in the Master Plan process, the more effective it will be. By bringing stakeholders into the process at an early stage, they can be involved in the development of issues to be addressed, can gain a greater understanding of the issues identified, can consider more alternatives before major decisions and commitments are made, and a greater understanding of the alternatives selected. Particularly where there are controversial issues involved, the earlier the stakeholders are engaged and the more their concerns addressed, the more likely a consensus can be reached.

If the stakeholders are not included until after important decisions are made, they are likely to distrust the plans, the planners, and the airport. Any innovative ideas will also be more difficult and expensive to bring into the plans the later the public is brought into the process.

2. Tools and Techniques

There are various methods used in informing and receiving input from the public. The method used will depend on how interested the public is in the airport master plan, the practices and policies of the airport sponsor, the complexity of the master plan, and the budget. A balance needs to be reached between the need for public involvement and the costs associated the process. Complex master plans will probably necessitate larger stakeholder groups, but care must be taken to make the discussions of the group focused and meaningful. Below are a selection of tools and techniques used in airport master plan public involvement programs.

COMMITTEES

The two most common forms of committees formed as a part of an airport master planning process are the Technical Advisory Committee (TAC) and the Citizen's Advisory Committee (CAC). Again, depending on the size and complexity of the master plan study, 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.

The TAC should be made up of those stakeholders with a high level of technical knowledge about airports and airport operations. They are major stakeholders in the airport's operation. The TAC will review and advise on the technical merit of the master plan.

The CAC membership should be made up of representatives from all of the stakeholders. The role of the CAC is to bring a consensus opinion from their respective constituencies to the master plan study team, interact with the planning team, and take information back to their constituents.

Additionally, a management/administrative committee typically made up of airport sponsor staff should be in place. This committee has the decision-making responsibility of the airport and should advise the planning team of policy decisions made during the course of the study.

PUBLIC AWARENESS CAMPAIGN

A public awareness campaign is an effective tool in gathering the public's interest in the master plan study, maintaining that interest throughout the course of the study, and keeping the public informed as to the progress and decisions made. Individuals and organizations should be given the opportunity to add their contact information to a mailing list to receive additional materials as the master plan study progresses. Two forms of public awareness campaigns are those using printed materials and those using the internet.

Printed materials include pamphlets, brochures, information packets, press releases, newspaper articles and advertisements, and general information packets. When an airport is located in a community where English is not the primary language of a large percentage of the residents, every effort should be made to make translations of the materials available.

Web pages with copies of the master plan documents are becoming increasingly popular. The master plan web page is often linked to the airport's website. Sophisticated sites may also include interactive or self-guided presentations.

PUBLIC INFORMATION WORKSHOPS

An "open house" format is recommended over a "public hearing" format for Public Information Workshops. The traditional, formal public hearing format gives the stakeholder the opportunity to make a public statement about the study, but it does not provide for an open dialogue between the public and the planning team. The open house format allows the public to come and go at their convenience. Each individual or group can interact "one-on–one" with the planners actually involved in the master plan. The stakeholders should be encouraged to ask questions and their comments should be solicited either in person or in writing.

The number of meetings held throughout the master plan process will be dependent upon the complexity of the master plan study and the interest the stakeholders express in the issues. It is typical to hold the meetings in a location close to the airport, but where the stakeholders may be spread across a large area as is typical around large urban airports, consider holding meetings at more than one location. In order to provide access to the largest number of stakeholders, public information workshops are typically held in the evenings. Where the community has a large elderly population, consider holding at least some of the meetings during the day.

SMALL GROUP MEETINGS

Small group meetings held throughout the master plan study will provide opportunities for the planning team to meet with local public officials, civic organizations, and neighborhood community groups. These meetings will allow informal, meaningful dialogue on specific issues of interest to that group and will provide the planning team with the opportunity to learn more about the groups' concerns.

In some communities, the needs and sensitivities of low income and minority populations should also be addressed in a manner that is 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."

3. Identification of Stakeholders

Each airport will have its own unique blend of stakeholders, and the make-up of the stakeholders for each planning study will vary. Suggested potential categories and types of stakeholders are listed below:

Airport sponsor organization representatives
- Airport board or commission representatives
- Airport Executive Director, Manager, or President
- Key airport sponsor staff

FDOT personnel
- District Aviation Representative
- Aviation Office – Aviation Program Development Manager

FAA personnel
- Airports District Office
- Airport Traffic Control Tower

Interested groups
- Adjacent private land owners and/or developers
- Airport hotel and business operators
- Chamber of Commerce representatives
- Neighborhood associations
- Local tourism boards

Resource agencies
- Federal Inspection Services (FIS) agencies
- Local political representatives
- Native American tribes
- State, regional, and metropolitan planning, transportation, and land-use planning agencies
- Transportation Security Administration (TSA)

Users and tenants
- Airlines
- Concessionaires
- Corporate aircraft owners
- Fixed Base Operators (FBO)
- Flight school operators
- General Aviation (GA) aircraft owners
- GA hangar owners and tenants
- Ground handling companies
- Ground transportation companies (taxis, limousine, and shuttle operators, etc.)
- Military users and tenants
- Parking lot operators
- Rental car operators

The stakeholders invited to participate will depend largely on the scope of the master planning project, as well as the issues that have been identified. While every effort may be made to include

all appropriate stakeholders at the beginning of the master plan process, it may be necessary to add stakeholders as the planning moves forward.

For committees, it should be determined that each representative is capable of effectively representing the consensus opinion of their group and that they will also take information received from the master plan meetings back to their respective groups. Further, the stakeholders should be advised that their role is advisory. They are not a decision making body. It is the role and the responsibility of the airport sponsor to make all decisions. This must be clearly stated at the initial meeting and as often as necessary throughout the process.

4. Identification of Key Issues

One of the most important steps in a master plan process is the identification of key issues, as they define the focus of the study. As discussed in Section I. A. I, *Initial Needs Determination*, the identification of issues by the airport sponsor highlights the need for a master plan study. The issues identified by the airport sponsor are used to develop the scope of work.

One of the first products of the Public Involvement Program is the identification of additional issues and opportunities by the stakeholders. These additional issues and opportunities should be added to the list initially developed by the airport sponsor, where appropriate. Collectively, the issues will shape the nature of the master plan study, particularly in the development and evaluation of alternatives. However, the issues also influence policy decisions.

Once the issues have been identified, the airport sponsor must determine if all of the issues will be addressed in the study. The addition of issues may influence the previously agreed upon scope of work. It may not be appropriate or financially feasible to address all of the issues in the master plan study and the airport sponsor may decide to address some of the issues in a separate forum.

5. Documentation of Guidelines – 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 Public Involvement Program. The objective of the law is to provide the public open access to governmental proceedings and decisions.

The "Florida Sunshine Law" states that "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, 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." As the 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, the meetings of these airports are subject to the "Florida Sunshine Law". 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.

The "Florida Sunshine Law" further provides for the following:

- Reasonable notice of all public meetings must be provided.
- The minutes of the meeting must be promptly recorded and open for public inspection.
- All public meetings must be held in a facility and location that does not discriminate based on sex, age, race, creed, color, origin, economic status, or which operates in such a manner that public access to the facility is unreasonably restricted.

- An exemption to the law provides that the governmental entity and the chief administrative or executive officer of the entity may meet with the entity's attorney to discuss pending litigation to which the entity is currently a party before a court or administrative agency if certain procedural conditions are met.

The committee and public meetings of the Master Plan Public Involvement Program are subject to the provisions of the Statute, because they are advisory committees. If the committees were only to conduct fact-finding activities including the gathering and reporting of information they would be exempt. As the planning team is asking for their opinion and soliciting their advice, the "Florida Sunshine Law" applies.

Public agencies are also allowed to adopt reasonable procedures with respect to the orderly conduct of public meetings. The agencies are allowed to restrict the amount of time that each individual speaks. When there are a large number of persons wishing to speak, the agency is allowed to request that a representative from each side speak rather than everyone present.

C. ENVIRONMENTAL CONSIDERATIONS

The National Environmental Policy Act (NEPA), signed into law on January 1, 1970, established the national environmental policy for the United States. It requires that each Federal agency assess the environmental impact of each of their actions prior to making a decision. All proposed federally funded actions that are not considered categorical exclusions by the lead agency (i.e. FAA) are required to prepare an environmental assessment or environmental impact statement, depending on the potential impact of the project.

In Florida, FDOT activities are regulated by many environmental rules and regulations as shown in Table II-2, and are administered by Federal, state, county, and local agencies. These agencies have established environmental programs, many of which may overlap. Contact with the regional planning agencies should be made to determine appropriate agency involvement before starting a project.

The master plan process should set the stage for the NEPA analysis. It is not intended that the NEPA analysis should become part of the master plan process.

The purpose of considering environmental issues within a master plan is to ensure that the master plan process considers potential environmental issues during all stages of the master plan. This begins with a detailed environmental inventory during the Existing Conditions phase and continues with the analysis and consideration of environmental issues during the preparation of the Facility Requirements. The environmental issues should be used as one or more of the screening criteria in the development and evaluation of alternatives. By considering the potential environmental impacts while developing and evaluating the alternatives, the need to redo planning as part of the NEPA process can be largely avoided. The Implementation Plan should include a Capital Improvement Program (CIP), as well as Environmental Action Plan, describing what is required to implement each project. The resulting environmental documentation should be consistent and supportable.

The environmental inventory should identify environmental issues in “footprint” areas that could be impacted by development components. Environmental issues of importance to the community and identified during the master plan public involvement program should be identified and documented. Regulatory agencies with authority for approval of all or components of the proposed projects within the master plan should also be identified in the environmental inventory process within the Existing Conditions.

While preparing the master plan document, FAA Order 5050.4, *National Environmental Policy Act (NEPA) Implementing Instructions for Airport Actions*, should be reviewed. The important part of the environmental overview is to determine if some of the concerns in the handbook apply to any of the proposed improvement projects. In addition to Federal requirements, state statutes and regulations must be considered. All impact categories shown in Table II-2 relative to the airport under study should be selected for consideration during the study. However, only those that are applicable or potentially significant should be discussed. The rest should be noted as not applicable or not discussed.

Table II-2
FEDERAL AND FLORIDA STATURES BY RESOURCE CATEGORY

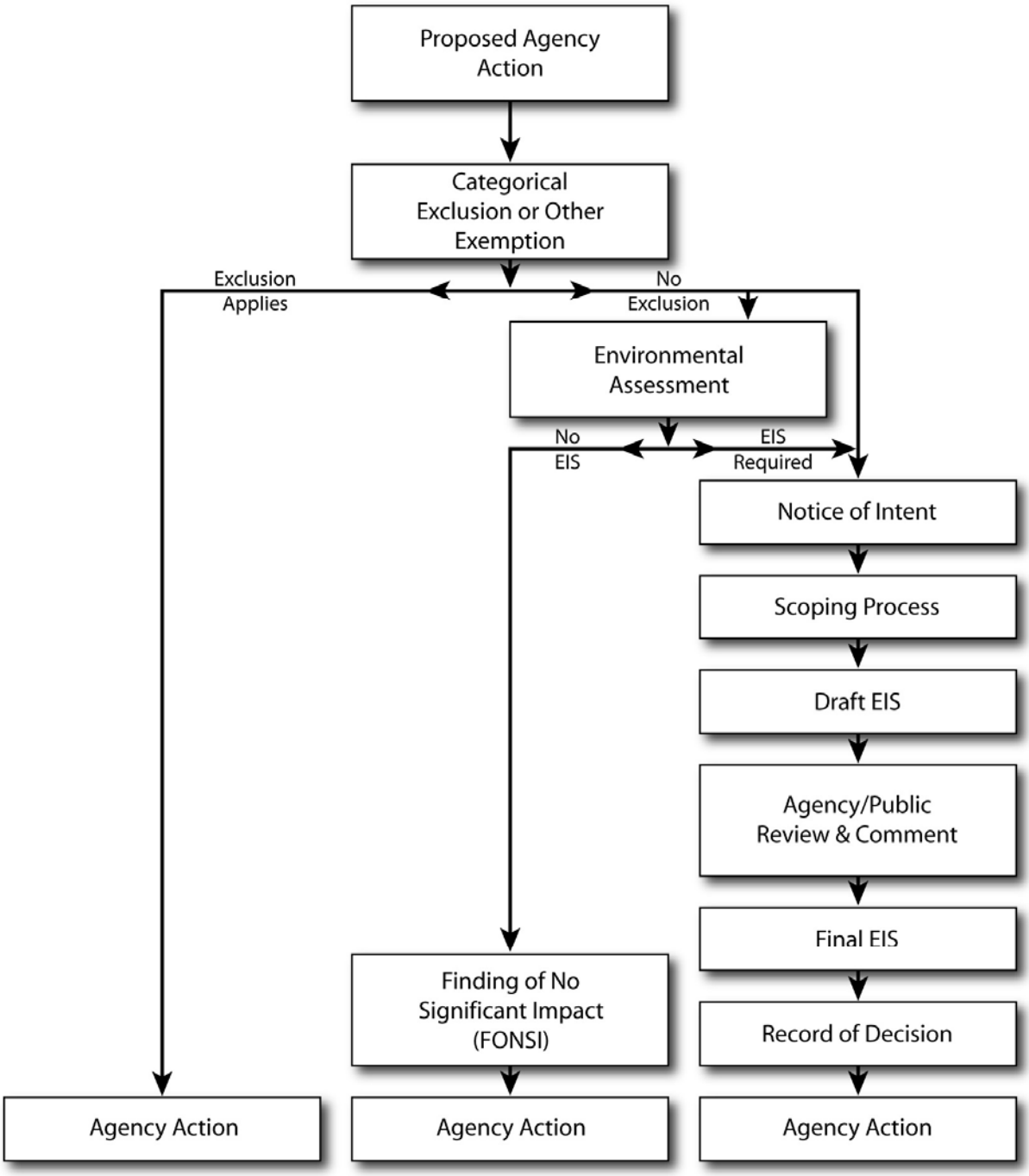
FAA Order 5050.4B Resource Categories	Federal Statutes	Florida Statutes
Air Quality	Clean Air Act (as amended)	Environmental Control (Florida Statutes (FS) Chapter (CH) 403)
Coastal Barriers	Coastal Barrier Resources Act as amended by the Coastal Barrier Improvement Act	Environmental Control (FS CH 403) Florida Coastal Zone Management Act (FS CH 380, Part II) Local Coastal Comprehensive Plan (FS CH 163, Part II) Water Resources (FS CH 373)
Coastal Zone	Coastal Zone Management Act (as amended) Executive Order 13089, Coral Reef Protection	Environmental Control (FS CH 403) Beach and Shore Preservation (FS CH 161)
Compatible Land Use	Aviation Safety and Noise Abatement Act (as amended)	Airport Zoning (FS CH 333) Land and Water Management (FS CH 380)
Construction Impacts		
Section 4(f)	Department of Transportation Act of 1966, section 4(f) [recodified in 49 USC. 303]	State Parks and Preserves (FS CH 258) Outdoor Recreation and Conservation (FS CH 375)
Farmlands	Farmland Protection Policy Act (as amended)	
Fish, Wildlife and Plants	Endangered Species Act (as amended) Sikes Act Amendments Fish and Wildlife Coordination Act The Fish and Wildlife Conservation Act (as amended) The Animal Damage Control Act	Wildlife (FS CH 372) Conservation (FS CH 369) Environmental Control (FS CH 403) Preservation of Native Flora of Florida (FAC 5B-40)
Floodplains	Executive Order 11988, *Floodplain Management*	
Hazardous Materials	Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (as amended) Toxic Substances Control Act Executive Order 12088	Environmental Control (FS CH 403)

Table II-2 continued on next page

Table II-2
FEDERAL AND FLORIDA STATUTES BY RESOURCE CATEGORY *(continued)*

FAA Order 5050.4B Resource Categories	Federal Statutes	Florida Statutes
Historical, Architectural, Archaeological, and Cultural	National Historic Preservation Act (as amended) Archaeological and Historic Preservation Act (as amended) Archaeological Resources Protection Act (as amended) Native American Graves Protection and Repatriation Act American Indian Religious Freedom Act Public Building Cooperative Use Act Executive Order 13006 Executive Order 13007 Executive Order 13175 Executive Order 11593	
Light Emissions and Visual Effects		
Natural Resources and Energy Supply		Energy Resources (FS CH 377)
Noise	Aviation Safety and Noise Abatement Act (as amended)	Airport Zoning (FS CH 333)
Socioeconomic Environmental Justice, and Children's Health and Safety Risks	Executive Order 12898 Executive Order 13045 Uniform Relocation Assistance and Real Property Acquisition Policies Act (as amended)	
Solid Waste	Resource Conservation and Recovery Act (RCRA) (as amended)	Pollution of Waters (FS CH 387) Environmental Control (FS CH 403)
Water Quality	Federal Water Pollution Control Act (as amended)	Water Resources (FS CH 373) Pollution of Waters (FS CH 387) Environmental Control (FS CH 403)
Wetlands, Jurisdictional or Non-jurisdictional	Clean Water Act, Section 404 (as amended) Rivers and Harbors Act, Section 10 Executive Order 11990	State Lands (FS CH 253) Water Resources (FS CH 373) Environmental Control (FS CH 403)
Wild and Scenic Rivers	Wild and Scenic Rivers Act (as amended)	

An overview of the NEPA review process is presented in Figure II-1.



Source: Bass, Ronald E. and Albert J. Herson, *Mastering NEPA: A Step-by-Step Approach*, 1993

Figure II-1
NEPA ENVIRONMENTAL REVIEW PROCESS: AN OVERVIEW

In order to determine the applicability of each impact category, information pertinent to the existing conditions at the airport and the surrounding area should be collected, for example:

- U.S. Department of Agriculture Natural Resources Conservation Service (formerly Soil Conservation Service) soil survey of the county in which the project is located
- U.S. Geological Survey 7.5-minute topographic quadrangle of the project area
- U.S. Fish and Wildlife Service national wetland inventory mapping (if available)
- Recent and historical (if available) aerial photographs of the project area
- Infrared photography of the project area (if available)
- U.S. Fish and Wildlife Service and State of Florida threatened and endangered species listings for the county in which the project is located and adjacent counties as conditions may warrant
- Federal Emergency Management Agency floodplain and floodway maps of the project area
- State Historic Preservation Office sites listed or eligible for listing on the National Register of Historic Places within the project area
- Florida listings of hazardous material sites within the project area

It is always wise to conduct site visits. The specific site information gathered during field investigations is often more important than the more general information collected through literature searches and background data collection. However, a combination of both the literature search and site investigation should give the preparer a more accurate overview of the applicable categories.

In Florida, several important issues should be evaluated, including:

- Coastal Barriers
- Coastal Zone Management
- Fish, Wildlife, and Plants
- Floodplains
- Water Quality
- Wetlands

Once the applicable categories are identified and analyzed, a brief summary of potential environmental impacts is prepared. The environmental overview within a master plan is intended to provide a discussion of the possible requirements for conducting an environmental assessment (EA), environmental impact statement (EIS), and/or development of regional impact (DRI); or request a categorical exclusion.

The master plan process provides the completed and approved aviation forecasts to the NEPA process, as well as the justification of the proposed development and the identification of alternatives. In reviewing and approving the master plan forecasts and Airport Layout Plans, the FAA is ensuring that the proposed development is justified and that the airport sponsor has considered safe and efficient alternatives for the proposed development.

Aviation forecasts for future years must be approved by the FAA before the NEPA process can begin. The proposed development must be consistent with and relevant to the aviation forecasts. If the development is not justified by the forecasts, it is unlikely to be approved in the NEPA analysis.

Within the NEPA analysis, it is necessary to identify a Purpose and Need for a project. The Purpose and Need is a statement of the rational and necessity for the project. It defines the aviation “problem” and indicates why the airport needs to solve the “problem”. The Facility

Requirements chapter of the master plan should have all of the information required to write the Purpose and Need.

1. Environmental Overview Labor Estimates

Not all planning documents require an environmental overview. During the scoping meeting, the extent of an environment overview should be discussed to determine the work effort.

Table II-3 estimates the amount of work normally required to complete an environmental overview. The result of an environmental overview is to assist in the development of alternatives that might be required for compliance with environmental regulations. The level of detail required for specific issues will vary depending on the location of the airport. For example, if an airport is located within a floodplain, the level of effort may be increased to examine drainage and wetlands more closely.

Table II-3
TYPICAL HOURS TO PREPARE ENVIRONMENTAL OVERVIEW ELEMENT

Airport Size	Labor Hours
< 500 acres	80-120
500 – 1,000 acres	120-200
1,000-2,000 acres	200-280
>2,000 acres	280-340

2. Environmental Considerations in Master Planning Alternative Analysis

The alternatives proposed for development must be consistent with and relevant to the approved aviation forecasts. If the development is not justified by the aviation forecasts, it is unlikely to be approved in the NEPA analysis. The facility requirements must be based on the approved aviation forecasts and the master plan should identify alternatives that can meet the facility requirements. The master plan should also document, but dismiss, alternatives that do not meet the facility requirements or are not feasible or prudent. The master plan should contain a detailed description of all of the components of an alternative, including secondary or related actions required in order for the alternative to be implemented. The identification of "linked" actions and their phasing should also be identified. From these detailed descriptions, the NEPA documentation must consider all "reasonable" alternatives. The environmental issues should be used as one or more of the screening criteria in the development and evaluation of alternatives. Where potential environmental impacts are identified within the master plan, a discussion of potential mitigation options should also be included.

3. FAA Funding Requires: CATEX, EA (FONSI), EIS (ROD)

The FAA Order 5100.38, *Airport Improvement Program Handbook,* states that all projects, in order to be eligible for AIP funding, must undergo environmental processing prior to FAA approval. The types of environmental processes and detailed descriptions of them can be found in FAA Order 1050.1, *Environmental Impacts: Policies and Procedures*, and FAA Order 5050.4, *National Environmental Policy Act (NEPA) Implementing Instructions for Airport Actions*.

There are three types of environmental processing used for Airport Improvement Program (AIP) projects. They are the Categorical Exclusion (CATEX), the Environmental Assessment (EA), and the Environmental Impact Statement (EIS). While the documentation for each of these environmental processes is typically done by the airport sponsor or a consultant, the Federal agency that is authorizing the Federal action, in the case of airports typically the FAA, must

approve or disapprove the Federal action based on the findings of the environmental process. Therefore, the FAA has a large stake in not only the veracity of an environmental document, but the process in which it was developed.

CATEGORICAL EXCLUSION

Categorical exclusions are exemptions for certain categories of Federal actions that meet the criteria contained in 40 CFR 1508.4, *Categorical Exclusion*. These are actions that the Council on Environmental Quality has found do not normally have adverse effects on the human environment. In reviewing the list of normally categorically excluded actions, in order to determine if a particular project might be eligible for this process, the FAA must also determine if there are extraordinary circumstances associated with the individual project that may have a significant environmental effect. If a project is not eligible for a CATEX, or the FAA official determines that there are extraordinary circumstances involved with an individual project, that official may decide that an environmental assessment should be prepared.

ENVIRONMENTAL ASSESSMENT

An Environmental Assessment is supposed to be a concise document that takes a "hard look" at the environmental effects of a proposed action. The preparation of an EA must be performed following a prescribed process. The EA document is not the decision. It is the documentation of the environmental resources in the area of the proposed Federal action or project and an analysis of how the proposed action would affect the environmental resources. The authorizing FAA official will make the final determination based on the EA documentation. At a minimum, an EA must be prepared when the proposed action is:

- Not categorically excluded
- Normally categorically excluded, but involves at least one extraordinary circumstance
- Not known to require an environmental impact statement, but is not categorically excluded

The EA must develop a statement of the purpose of the proposed project as well as the need for the proposed project. The EA is obligated to look at not only the alternative proposed by the airport sponsor, but also a no-action alternative and reasonable alternatives including those outside the purview of the airport sponsor. The EA will look at the impact of the proposed alternatives and the no-action alternative on a range of environmental issues. Following the submission of the EA to the FAA, the FAA will review the documentation and, if they can approve the federal action based on the environmental process and documentation, the FAA will issue a Finding of No Significant Impact (FONSI). If the FAA cannot approve the project based on the EA, they can request correction of deficiencies, and/or attempt to resolve any outstanding issues. If these measures fail, are inadequate, or do not resolve the concerns, the FAA will require additional study through an Environmental Impact Statement.

Upon completion and the issuance of a FONSI, an EA is considered a Federal document. The FAA considers an EA valid for a period of three years beginning when the responsible FAA official accepts the final EA as a Federal document. If major steps towards the implementation of all project phases have not commenced within three years, a written reevaluation from the responsible FAA official will be required.

ENVIRONMENTAL IMPACT STATEMENT

An Environmental Impact Statement is required when the proposed action, including mitigation, would continue to have a significant impact on the environment. The stated primary purpose of an EIS is "to be an 'action-forcing tool' to ensure Federal government programs and actions meet NEPA's goals and policies." The EIS looks at specific environmental resources that would be impacted.

An EIS can be done without a preceding EA, particularly where the FAA official is aware that there is a great potential for a significant environmental impact with a particular project or the preferred alternative of a project. Projects that normally would go directly to an EIS include a new airport and a new runway within a Metropolitan Statistical Area (MSA).

As with an EA, the EIS is obligated to look at not only the alternative proposed by the airport sponsor, but also a no-action alternative and reasonable alternatives including those outside the purview of the airport sponsor. The EIS will look at the impact of the proposed alternatives including the no-action alternative. It will have a statement of the purpose and need for the project. The FAA official reviewing the EIS must weigh the purpose and need for the project and the most reasonable alternative for implementation based upon the impact the project would have on the environment.

Following the publication of the accepted EIS in the Federal Register, the FAA may issue a Record of Decision (ROD). The final decision on an EIS is considered valid for a period of three years beginning from the date of the "Notice of Availability." If major steps toward the implementation of all project phases have not commenced within three years, a written reevaluation from the responsible FAA official would be required.

4. National Pollution Discharge Elimination System

The U.S. Environmental Protection Agency (EPA) developed permitting regulations under the National Pollutant Discharge Elimination System (NPDES) to control stormwater discharges within 11 categories of industrial activity including the discharges from airports, airport terminals, and airline carriers. As a result, NPDES permitting authorities, including the EPA and, in Florida, the Florida Department of Environmental Protection (DEP) issue stormwater permits to control runoff from these industrial facilities.

The airport sponsor/owner and the airport tenants, which perform any of the following activities and which have stormwater discharges must apply for a NPDES stormwater permit:

- Service, repair, wash, or maintain aircraft and/or ground vehicles
- Aircraft fueling
- Clean and maintain equipment including:
    - Vehicle and equipment rehabilitation
    - Mechanical repairs
    - Paining
    - Fueling
    - Lubrication
- Runway maintenance involving the removal of tire rubber, oil and grease, paint chops, or jet fuel from the runway surface
- Deicing/anti-icing operations that conduct the above activities

The airport sponsor/owner and the airport tenants are encouraged to apply as co-permittees under a permit and to work in partnership to develop and implement a Stormwater Pollution and Prevention Plan (SWPPP). A SWPPP is a written assessment of potential sources of pollutants in stormwater runoff and control measures that will be implemented at the airport to minimize the discharge of the pollutants in runoff from the site.

Typically, the following requirements for a stormwater permit include:

- Development of a written SWPPP with a copy to be kept on site at all times and updated as necessary
- Implementation of control measures including site specific Best Management Practices (BMPs), maintenance plans, inspections, employee training, and reporting
- Collection of visual, analytical, and/or compliance monitoring data to determine the effectiveness of the BMPs
- Submittal of a request for permit coverage or Notice of Intent (NOI). An interactive NOI (iNOI) is now available and allows for the completion, editing and submittal of the NOI and other NPDES related documents.

Up to date information and resources for NPDES can be found at the following web addresses:

- www.epa.gov/npdes/stormwater.msgp
- www.dep.state.fl.us/water/stormwater/npdes

5. General Comprehensive Plan and Master Plan Integration

Florida Statute Chapter 163, *Intergovernmental Programs*, also known as the Growth Management Act, requires all counties and cities to adopt a Local Government Comprehensive Plan (LGCP). Such a plan will guide the future growth and development of that local government. Specific areas to be covered in each comprehensive plan include existing and future land-use, housing, transportation, infrastructure, coastal management, conservation, recreation and open space, intergovernmental coordination, and capital improvements.

While development projects within an FAA-approved master plan for licensed, publicly operated airports are exempt from oversight by the local community with respect to the LGCP, there should be coordination between the airport, the local government, and the Regional Planning Council(s) (RPC). For those airports in metropolitan areas or regions, coordination must also occur between the airport and the Metropolitan Planning Organization(s) (MPO). Capital projects must be adopted into the MPO's Transportation Improvement Program before it can be included in FDOT's work program. The airport's Capital Improvement Program (CIP) should be consistent with the LGCP and must be consistent with the Florida Aviation System Plan (FASP) and the airport's role as it is identified in the FASP.

The political entity owning an airport is responsible for approving the airport's master plan. An airport's master plan may include development projects in the CIP that are inconsistent with the LGCP, but these development projects must be thoroughly documented in the master plan and they will not be eligible for FDOT funding.

FDOT approves an airport's master plan and Airport Layout Plan (ALP) based on state standards, guidelines, and requirements for the preparation of airport master plans. If a master plan is submitted to FDOT for approval, that contains CIP projects that are inconsistent with the LGCP, and the projects are not thoroughly documented in the master plan, the master plan will not be approved by FDOT. If the master plan contains CIP projects, which are inconsistent with the LGCP, and FDOT funding is proposed for those projects, the master plan will not be approved by FDOT. FDOT funding must be removed from these projects before the airport master plan can be approved. In metropolitan areas, CIP projects must be included in the MPO's Transportation Improvement Program before they can be included in FDOT's work program.

6. Guidance to Local Community Planners Regarding Integration of Appropriate Master Plan Sections into the Local Government Comprehensive Plan (LGCP)

Florida Statute Chapter 333, *Airport Zoning*, requires political entities to adopt and enforce airport-zoning regulations that would restrict incompatible land uses in the immediate vicinity of airports. FDOT also encourages the protection of existing and future airport development in the preparation of the LGCP. Specifically, the sections on land-use, transportation, intergovernmental coordination, and the capital improvement program within the LGCP would be directly related to an airport master plan. Most of the data relating to the airport's development that would be pertinent to the LGCP can be taken directly from an airport's master plan.

In the 2009 legislative session, House Bill 1021 (codified as Chapter 2009-85) was passed and signed into law. This law requires local governments to update their LGCP Future Land Use Element by June 30, 2012 to include criteria by which they will ensure that the land-use adjacent to an airport would become compatible. In addition, the Intergovernmental Coordination Element of the LGCP must also be amended to recognize airport master plans.

Licensed, publicly owned and operated airports may elect to have their master plans incorporated into the LGCP. The local government in which the airport or development project is located would incorporate the master plan into the LGCP by adopting a comprehensive plan amendment. However, the amendment must also address land-use compatibility with respect to airport zoning, consistent with FS Chapter 333. Once the airport master plan has been adopted into the LGCP, development of the airport consistent with the airport master plan and any subsequent amendments that have been incorporated into the LGCP comply with the Development of Regional Impact (DRI) process.

7. LGCP and Airport Master Plan Sections Integration of Existing and Future Land Use Maps

The Florida Administrative Code 9J-5 requires that each local community develop as part of the LGCP an Existing Land Use Plan and a Future Land-Use Plan. The Existing Land Use Plan must show the generalized land uses within the LGCP jurisdiction, specific land use related analyses such as availability of services, the character and magnitude of existing and available land, and the amount of land needed to accommodate projected population. The Existing Land Use Plan must also identify the land uses found in independent districts and local governments adjacent to or wholly contained within its boundaries, including airports, and analyze the compatibility of each of the adjacent land uses to each other, including airports, their clear zones, and their obstructions.

The Future Land Use Plan must also show not only the future land uses within the jurisdiction of the LGCP, but also those land uses for entities not under its jurisdiction, but that are contained within or that border its boundaries. This includes airports, their clear zones, and their obstructions.

In order to be able to include this information in the LGCP, the local governments must have access to the airport master plan, airport layout plan, and any amendments made to either. Upon completion of the airport master plan, a copy of the master plan should be submitted by certified mail to "all affected governments" having jurisdiction over the airport simultaneously to submitting the document to FDOT. "All affected governments" is defined as any city or county having jurisdiction over the airport, as well as any city or county located within two miles of the land subject to the master plan.

8. Development of Regional Impact Process and References to Updated Legislation

A Development of Regional Impact (DRI) is defined by FS Chapter 380.06 as "developments which, because of their character, magnitude, or location, are presumed to have a substantial effect upon the health, safety, or welfare of citizens of more than one county." Projects that fall under this broad definition include airport expansions. The following types of airport projects have been specifically called out as being DRIs:

- A new commercial service or general aviation airport with paved runways
- A new commercial service or general aviation paved runway
- A new passenger terminal facility
- Lengthening of an existing runway by 25 percent or more or strengthening the runway to the extent that the result would be an increase in aircraft size or number of jet aircraft using the airport
- An increase in the number of gates by 25 percent or 50,000 square feet, whichever is greater, at a commercial service airport or a general aviation airport with regularly scheduled flights

Expansion of existing terminal facilities at a nonhub or small hub commercial service airport is specifically exempted from being a DRI as is any development solely for the purpose of safety, repair, or maintenance that does not have the possibility of increasing or changing the type of aircraft operations. Facility development that may increase the square foot area of a terminal, but does not increase the number of aircraft gates or change the types of aircraft activity at the airport is also exempted from being a DRI.

The purpose of calling out DRIs from the local level early in the process is to identify those issues that might affect more than just one community or region. The early identification allows state and regional agencies to provide technical assistance in the identification of resources and facilities of regional concern and to assess and mitigate the project's potential impact on those resources. The state and regional agencies have established definitions of significant impact as well as uniform standards for mitigation of regional impacts in such areas as air quality, public facilities, archaeological or historical resources, transportation, and hurricane preparedness, among others.

A key concept of the DRI is transportation concurrency, which is a growth management strategy developed to ensure that transportation facilities are available before or at about the same time as the development begins to have impact. Local governments must determine if adequate facilities will be available to meet the expected demand. If a proposed development will create more demand than the existing facilities can accommodate, then the developer must either provide the necessary improvements, contribute money to pay for the improvements, or wait until government provides the necessary improvements. The local government must demonstrate and ensure that adequate facilities will be available within three years of issuing a building permit for a project.

THE DRI PROCESS

The DRI process is begun when an airport, as the developer, contacts the Regional Planning Council(s) (RPC) and requests a pre-application conference. The pre-application conference will take place between the developer and various state and regional agencies identified by the RPC. The pre-application meeting will establish the parameters of the Application of Development Approval (ADA). When requesting the pre-application meeting, the developer should also request from the RPC prior to the meeting a list and explanation of the methodologies acceptable to the region for ADA review. The following minimum information must be delivered to the RPC at least 10 days prior to the pre-application meeting. Regional Planning Councils may require additional information, more specifically:

- Name of the development
- Name, address, and telephone number of the applicant
- Name, address, and telephone number of the authorized agent
- Project description, including proposed land uses and amounts
- A preliminary master plan, if it has been previously developed
- Proposed phasing of the project, including preliminary phasing dates and build out dates
- The existing land uses and existing vegetation on the site
- An aerial photograph of the site
- A brief environmental assessment of the site including:
    - Probable occurrence of wetlands
    - Listed plant and animal species
    - Portions of the site, if any, within the 100-year floodplain
    - A letter from the Division of Historical Resources indicating if there are potentially regionally significant historical or archaeological sites on the property
- A general location map indicating:
    - Adjacent land uses
    - The existence of public facilities, regional activity centers, and any existing urban service area boundary
    - Any other lands owned or leased by the applicant within two miles
    - The proximity of this site to regionally significant resources identified in the Regional Policy Plan, such as significant bodies of water, wetlands, or wildlife corridors
- A map of the proposed study area indicating the functional classification and number of lanes of all roadways in the study area except residential streets
- Whether a comprehensive plan amendment will be required for this development
- A list of all permits already applied for or received, specifying the date of application, issuing agency, and function of the permit
- A summary of each of the proposed methodologies, assumptions, models, criteria, etc., that will be used to answer ADA questions
- A list (or formal written request if required by the regional planning council) of ADA questions the developer wishes to have deleted or exempted, along with an explanation of why it is appropriate to delete the question from the ADA

The purpose of the pre-application meeting is to come to a clear understanding among all parties as to the methodologies and assumptions that will be used in completing the ADA. This will streamline the review period and decrease the number of insufficiency findings as much as possible.

After the pre-application meeting, the developer will complete the ADA and file it with the local government(s), the RPC, and the Florida Department of Community Affairs (DCA). The RPC coordinates the multi-agency review of the ADA to determine if it meets the requirements of adopted state and regional plans. The multi-agency review may determine that one or more

requirements have not been met, at which point the developer will be asked to provide additional information. Once the ADA is found to be compatible with the state and regional plans, the RPC will schedule a public hearing and publish a notice. At the public hearing, the RPC considers recommendations to adopt the ADA. These recommendations are then forwarded to the local government(s) for consideration. The RPCs are advisory bodies to the local government(s); the local government(s) has the authority to approve or deny the ADA.

The local planning agency will take the recommendation of the RPC together with local issues and/or concerns and construct a draft development order. The local government will then hold a second public hearing on the development project. At this public hearing, the local government will consider the reports and recommendations of the RPC and the local planning agency. If the local government agrees to approve the project, it will issue a binding Development Order that contains the agreements and parameters of the project as well as any mitigation measures that have been adopted.

THE COMMUNITY RENEWAL ACT

During the 2009 Florida legislative session, House Bill 360 was passed and subsequently signed into legislation as the Community Renewal Act (ACT). This Act eliminates the state-mandated concurrency and DRI requirements for Dense Urban Land Areas. The Act defines Dense Urban Land Areas as:

- A municipality with an average of 1,000 people per square mile of land area and a population of at least 5,000, or
- A county, including its municipalities, that has an average of 1,000 people per square mile of land area, or
- A county, including its municipalities, with a population of at least 1 million

As of July 1, 2009, there are eight counties in Florida that are defined a Dense Urban Land Areas. These counties are Broward, Duval, Hillsborough, Miami-Dade, Orange, Palm Beach, Pinellas, and Seminole. Numerous municipalities also qualify. A current list of these municipalities can be found at the website for the Department of Community Affairs at www.dcs.state.fl.us.

Development that is eliminated from the DRI process in designated Transportation Concurrency Exception Areas (TCEAs). The concurrency requirements and the DRI process continue to apply in all areas outside of the Dense Urban Land Areas and TCEAs. A development located partially outside of a TCEA is subject to DRI review and the exemption does not apply to areas within an Area of Critical State Concern, the Wekiva Study Area, or within two miles of the Everglades Restoration Area. Previously approved Development Orders may continue to be in effect, but developers may elect to opt out of the DRI.

Cities that qualify as Dense Urban Land Areas are also TCEAs. Cities and counties that are not Dense Urban Land Areas may designate in their LGCP certain specific areas as TCEAs. Dade County is exempted from TCEA as it has exempted more than 40 percent of the area inside the Urban Service Area for Transportation Concurrency for Urban Infill. Broward County is exempted because TCEA does not apply to Transportation Concurrency Districts located in counties of at least 1.5 million people that use a concurrency assessment to support alternative modes of travel.

Local governments must amend their comprehensive plans to comply with the abolition of state concurrency laws. Until they do so, however, existing transportation concurrency provisions continue to apply within TCEAs as local law. Local governments may adopt other requirements such as mobility fees or public facility requirements, but they must comply with the new mobility planning requirements by mid-2011.

HOUSE BILL 697 (2008)
In 2008, House Bill 697 amended Florida Statutes Chapter 163, *Intergovernmental Programs*, to establish new local planning requirements. These include:

- A Future Land Use Element based on data and studies that demonstrate:
  - Discouragement of urban sprawl
  - Energy efficient land-use patterns that account for existing and future electric power generation and transmission systems
  - Greenhouse gas reduction strategies
  - The Future Land Use Management must be amended to depict Energy Conservation Areas
- Traffic Circulation/Transportation Elements must be amended to incorporate transportation strategies to reduce greenhouse gas emissions
- The Conservation Element must address "factors that affect energy conservation"
- The Housing Element must be amended to include energy efficient new housing and the use of renewable energy resources

RECENT ADDITIONAL ENVIRONMENTAL AND MANAGEMENT LEGISLATION
- Florida Statute (FS) Chapter 2009-49 requires the government to prove certain elements of an impact fee by a preponderance of the evidence and prohibits a court from using a deferential standard in a court action.
- FS Chapter 2009-85 requires, among other provisions, local governments to update their LGCP Future Land Use Element by June 30, 2012 to include criteria by which they will ensure that the land-use adjacent to an airport would become compatible. In addition, the Intergovernmental Coordination Element of the LGCP must also be amended to recognize airport master plans.
- House Bill 1065, *Airline Safety and Wildlife Protection Act of Florida*, exempts airport authorities and other specific entities from penalties, restrictions, or sanctions with respect to authorized actions taken to protect human life or aircraft from wildlife hazards.

9. Aviation Fuel Waste Management

It is against Florida law (Statute 403, *Environmental Control*) to dump waste aviation fuel onto the ground, onto the airfield pavement or into Florida's waterways. This includes the disposal of sampling fuel for testing or "sumped" fuel from preflight inspections. Waste aircraft fuel meets the definition of a hazardous waste. A previous procedure for disposal of "sumped" fuel was to throw it onto the apron to evaporate. This illegal practice causes air pollution as well as potential soil contamination through runoff of the waste fuel from the apron. Pilots, fixed base operators, and all others are required to dispose of the "sumped" fuel properly. The penalty for improperly disposing of the aviation waste fuel is a fine of up to $50,000.

There are a number of options and devices available to properly dispose of preflight "sumped" fuel"

- Use the current fuel-testing cup to dispose of aviation waste fuel into aviation fuel waste disposal units located on the apron

- Embry-Riddle Aeronautical University has developed a Gasoline Analysis Test Separator (GATS) jar, which allows the return of clean fuel back into the aircraft fuel tank and contaminated fuel to be dumped into a disposal unit located on the ramp.
- Other types of fuel-filtering devices are on the market and can be purchased through aviation supply companies.

D. EXISTING CONDITIONS

Data collection and documentation of the existing conditions are two of the first tasks that need to be completed when preparing an airport master plan. FAA Advisory Circular (AC) 150/5070-6, *Airport Master Plans,* provides detailed guidance for the gathering and analysis of existing conditions at airports. This Guidebook serves to provide a more detailed focus as it pertains to the state of Florida in the collection and analysis of existing conditions at an airport.

1. Inventory and Data Collection

Drawings and other documents in FDOT and FAA databases and on file with the airport sponsor are a good source of data and should be reviewed early in the inventory effort. The data may need to be supplemented with field observations, personal interviews with tenants and users, Internet searches, and surveys of passengers and employees. The inventory database will serve two primary functions. First, it will allow the reader to gain a full understanding about the airport including its setting, role, activity levels, and facilities offered. Second, it will serve as a reference to be used throughout the study as questions arise about facilities and their conditions. The inventory database should at a minimum include the following information.

AIRPORT LOCATION

A significant portion of the inventory will be devoted to indentifying the existing physical facilities at the airport. The location of the airport should be described relative to an associated city, township, county, etc. Major highways and airport access routes should be described and depicted. Figure II-2 illustrates a sample location map. An additional vicinity map showing the access routes in and around the airport may be needed for larger airports.

Figure II-2
AIRPORT LOCATION MAP

AIRPORT ROLE
The role of the airport should be described in terms of the service it provides to the community, as well as the classification of the airport in the FAA's National Plan of Integrated Airport Systems (NPIAS) and the Florida Aviation System Plan (FASP).

ACTIVITY PROFILE AND CRITICAL AIRCRAFT TYPES
Historic and current activity and based aircraft levels should be collected along with the identification of the critical (most demanding) aircraft or aircraft class using the airport.

AIRPORT FACILITIES AND CONDITIONS
Classifications that are commonly used to organize this information include commercial passenger terminal facilities, cargo facilities, support facilities, access, circulation and parking, and utilities. All of these, as well as their condition, such as good, fair, or poor, should be documented. Table II-4 and Table II-5 show examples of this documentation. The following should also be included:

- Runways and taxiways (including pavement strengths)
- Lighting and NAVAIDs
- Terminal, administration, and other buildings
- Aircraft hangar and apron areas
- Fuel storage facilities
- Airport access roads and vehicular parking

Table II-4
EXISTING AIRCRAFT HANGAR AREAS - TYPICAL FLORIDA AIRPORT

Reference Number	Hangar Size in Square Feet	Approximate Aircraft Parking Spaces	Type/Condition
1	7,500	6	One-story hangar/good
2	6,300	2	One story hangar and storage/good
3	7,900	8	One-story hangar and storage/fair
4	7,800	9	T-hangar and office/fair
5	11,600	10	T-hangar and storage/good
6	11,300	12	T-hangar and storage/fair
7	10,200	9	One-story hangar/fair
8	6,400	3	Maintenance hangar and main FBO office/fair
Total	69,000	59	

Table II-5
EXISTING AIRCRAFT APRON AREAS - TYPICAL FLORIDA AIRPORT

Reference Number	Apron Size in Square Yards	Approximate Aircraft Parking Spaces	Type/Condition
Area A	2,240	6	Paved itinerant parking, fueling apron/good
Area B	2,290	5	Paved Itinerant parking, fueling apron/good
Area C	13,650	38	Paved and unpaved tie-down area/fair
Area D	2,430	8	Unpaved tie-down area, paved pads & taxilane/fair
Area E	2,500	10	Tie-down area with paved pads and taxilane/fair
Area F	7,470	24	Paved tie-down area and taxilane/fair
Area G	4,800	15	Unpaved tie-down area/fair-poor
Total	35,560	106	

AIRSPACE STRUCTURE AND INSTRUMENT APPROACH CAPABILITIES

Since airspace structure and instrument approach capabilities of the airport can influence planning decisions, both should be discussed in the inventory section. With regard to airspace structure, it is desirable to include an illustration (based on the appropriate sectional aeronautical chart) depicting the airport, surrounding airports, airspace structure and restricted airspace. An obstruction chart should be included if one is available.

Data collection should focus on the functional use and geometry of the runways, taxiways and holding aprons; lighting, marking and signage of runways and taxiways; and navigational aids, visual approach aids, and instrument approach procedures. Information on the use of the airspace, air traffic interaction with other airports or reserved airspace, obstructions to air navigation, noise abatement procedures, and airfield or navigational aid shortcomings needs to be collected. Historical wind data and weather conditions should be compiled as well.

Data collection for commercial passenger terminal facilities includes:

- The terminal building space inventory by functional use and size
- Ticket counters; number of gates and lineal feet of gate frontage
- Aircraft parking apron area
- Restaurants and other concession space
- Passenger security screening procedures

Surveys conducted in holdrooms are often used to gather information about passenger characteristics that can be used in determining future facility requirements.

General Aviation facility data that needs to be collected includes:

- The quantity and type of hangars
- Transient aircraft parking apron areas
- Tie-down positions
- General aviation terminal facilities
- Aircraft parking aprons
- Fixed base operators
- Flight schools
- Pilot shops
- Number and mix of aircraft

Surveys conducted of general aviation pilots can identify useful information in determining general aviation facility requirements.

Air cargo facilities data collection includes the quantity and area of air cargo buildings and aircraft parking aprons. At airports with significant air cargo activity, freight forwarders and other support functions are often located on or in areas adjacent to the airport. On-airport air cargo facilities should be identified on the airport layout plan; off-airport facilities should be noted in the inventory.

The quantity and type of support facilities at an airport encompasses a broad set of functions that ensure smooth and efficient airport operations. These include Aircraft Rescue and Fire Fighting (ARFF) stations, airport administrative areas, airport maintenance facilities, airline maintenance hangars, aircraft fuel storage, heating and cooling systems, and FAA facilities. The operating hours for air traffic control towers should be noted.

Information with respect to ground access systems and commercial areas that serve the airport, such as on-airport access roads, circulation and service roads, parking and curb space, including information on alignment, condition and capacity will be needed. Also, include information on public transportation services, such as bus, rail, taxi, and limousine, and the percentage split between personal and public transportation use. Consultation with state and local transportation agencies responsible for planning and operating surface transportation systems should result in data on proposed highway and transit plans, as well as traffic density statistics relative to roads leading to and from the airport. Also, include information on rental car facilities and activity. Rental car facility planning is typically a critical planning element for the terminal area and parking facilities at airports.

Data collection should include descriptions of major elements of the utility infrastructure, such as water, sanitary sewer, communications, heating/cooling, and power. Historical consumption data may be necessary to quantify future utility loads. Stormwater drainage, deicing, and industrial waste disposal systems should also be included as appropriate.

Finally, data with respect to non-aeronautical uses on the airport such as recreational facilities, and parks, industrial parks, agricultural or grazing leases, and retail businesses will need to be documented.

The above list of inventory items of existing facilities is not exhaustive and individual master plan inventory lists need not include all the classifications described above. The list is a general outline that should be modified to conform to the specific circumstances of an individual airport and the scope of the master plan.

WIND PERSISTENCY/COVERAGE

Since wind persistency can also influence planning decisions, data for both visual flight rule and instrument flight rule conditions should be included in the inventory section, along with the percent of wind coverage that the runway configuration provides. FAA Advisory Circular 150/5300-13, *Airport Design,* should be consulted for proper procedures to determine wind coverage based on a wind rose analysis. Wind data can be obtained from the National Oceanic and Atmospheric Administration, National Climatic Data Center in Asheville, North Carolina.

Wind data is not available for airports that do not have the capability of recording wind and weather observations. In such cases, wind data from a nearby airport may be used to develop a wind rose specific to the runway configuration.

AIRPORT PROPERTY LINE AND ADJOINING LAND-USE

During the inventory process, airport property owned both in fee simple and easement should be documented. In addition, adjoining land-use, area land-use plans and zoning should be

documented and applicable community comprehensive plans should be collected. Local government comprehensive plans will provide a great deal of land-use and zoning data. The inventory should briefly discuss each of these. It is also recommended that illustrations be included to depict existing airport property and adjoining existing land-use, area land-use plans, and area zoning.

SOCIOECONOMIC CHARACTERISTICS

Socioeconomic data serves two purposes in a master plan study: to ascertain the nature of the community and market the airport serves and to provide specific inputs for the preparation of aviation demand forecasts, particularly econometric demand models. The master plan should focus on factors that affect the community's need for air transportation.

Socioeconomic characteristics of the airport service area (for such items as population, employment, and income historical data) will vary in relevance depending on the detail necessary to develop forecasts of aviation demand. The inventory section should briefly document the socioeconomic data collected (providing agency, types of projections, and period) and briefly state projections. The amount of socioeconomic data collected should be limited to only that which will be needed to develop the aviation activity forecasts.

LABOR ESTIMATES

Table II-6 estimates the amount of work normally required to complete the introduction, inventory, and data collection elements. Deliverables from these efforts include a narrative, illustrations, and an electronic database containing the inventory data of location, existing facilities, and airspace structure.

Table II-6
TYPICAL HOURS TO COMPLETE EXISTING CONDITIONS ELEMENT

Airport Role	Hours to Develop the Inventory and Data Collection
Basic Utility	25-45
General Utility	45-60
Transport (General Aviation)	60-80
Transport (Reliever)	70-100
Passenger Transport (Commercial)	80-120
Passenger Transport (Commercial Primary)	100-150

2. Inventory and Description of Existing Facilities

The inventory of existing conditions at an airport is a critical task in a master plan study, so this effort must be closely managed. Data should be collected only when there is a clear understanding of the need for the information to support the demand/capacity analyses and determination of facility requirements.

The documentation of existing airport conditions, as described above, should make liberal use of drawings, tables, aerial photographs, and exhibits produced from Geographic Information System (GIS) databases. Presented in this manner, such information is usually easy to understand, interpret, and locate for later reference.

3. Inventory of Environmental Issues

The primary objective of an environmental overview is to document environmental conditions that should be considered in the development and evaluation of airport development alternatives. This

should also ensure that the planning of all reasonable alternatives has occurred prior to the commencement of the NEPA process.

Noise levels, air and water quality are the most common environmental concerns. Planners should refer to the current version of FAA Order 1050.1, *Environmental Impacts*: *Policies and Procedures*, for a complete list of environmental impact categories that may need to be examined. Federal and state environmental regulations should also be considered.

A master plan study should examine the regional setting of an airport and the land-use patterns around it. This task is important, because the impact of airport planning decisions can extend well beyond the airport property line.

Collect all applicable documents such as official maps, the latest area-wide comprehensive land-use and transportation plans, applicable municipal zoning ordinances, and other land-use controls and unusual building code provisions, including height zoning ordinances, noise overlay zones, and airport overlay districts. All of these documents will help prepare a comprehensive master plan and help develop a practical land-use strategy.

4. Inventory of Financial Issues

Airport master planners must examine an airport's financial resources, including its basic business model, operating revenues and expenses, and sources and uses of capital funds. An airport business model summarizes the airport's business structure to help planners organize the base amount of financial data available at most airports. The business model summary should describe the financial operation of the airport, including how its costs and revenues are charged or credited to airport users, and how any operational surplus or deficit is handled. In addition, the business model summary should outline how the airport typically funds capital improvement projects (AIP and other grants, Passenger Facility Charges (PFC), airport revenue bonds, etc).

Operating revenues and expenses summarizes several broad categories of operating revenue and expenses. The FAA requires all commercial service airports to submit financial information to the FAA annually on FAA Form 5100-127, *Operating and Financial Summary*, and these reports may provide a good starting point for information.

Capital funding summarizes the airport's ongoing Capital Improvement Program (CIP) and the funding of the CIP. The CIP can be funded from many sources, including revenues from airlines, concessionaires, other airport tenants, tax levies (if applicable), Airport Improvement Program (AIP) grants, other federal and state grants-in-aid, and airport revenue bond proceeds.

OVERVIEW OF GRANTS

There are different types of grants from FAA and the State for which airports can apply to complete CIP projects. FAA funding grants include funds from the AIP. The AIP allocates funds for projects at airports that meet specific criteria. The airport must be in the NPIAS (National Plan of Integrated Airport Systems) in order to receive Federal funding. The AIP funds are distributed between apportioned and discretionary funds. Apportioned funds can be used for most airport projects and are based on the number of enplanements the airport has. The distribution of discretionary funds is made first to the highest priority projects and then to succeeding lower priority projects until all funds are distributed. The allocations vary based on type of project and category of airport. The amount allocated under AIP varies each year as appropriated by Congress and is not enough to meet the needs of all airport projects. Therefore, the FAA allocates funding based on a competitive prioritized process and other factors.

The State of Florida also participates in funding improvements, at publicly owned, public-use airports, through FDOT. FDOT grants are subject to availability of funds appropriated by the

Florida Legislature for each fiscal year. The three keys to obtaining FDOT funds is to assure that the airport is in the Florida Aviation System Plan, has an approved master plan or airport layout plan that is consistent with the Florida Aviation System Plan, and the projects have been included in the Joint Automated Capital Improvement Plan (JACIP).

LOCAL FINANCIAL SUPPORT

In many cases, both the FAA and the State of Florida will provide funding for capital improvement projects. The airport sponsor must also contribute a certain portion of the cost of the project. This is what is known as the local share. Typically, the local share is one-half of the non-FAA shares.

Traditional means of raising the local share include the airport sponsor taking out general obligation bonds (municipality), general aviation revenue bonds, or industrial development facility bonds. General obligation bonds are normally issued by municipalities and typically have a lower interest rate than other types of bonds. General Aviation Revenue Bonds usually can be issued for a longer period of time (25-30 year terms), resulting in lower debt payments, but might have a higher interest payment. Industrial development bonds are a special type of revenue bond suited for smaller airports, and offer tax-exempt rates for making a capital investment at an airport.

JACIP

The Joint Automated Capital Improvement Plan (JACIP) is a continuous process through which the Florida public airports, the FAA, and FDOT program the airport capital improvement funds for both the FAA (AIP) and the FDOT work programs. It is recommended that identified airport capital improvement projects for which state and/or federal funds will be required be put into the JACIP as much as five years in advance of when the project is likely to be implemented. It is required that each public-use airport sponsor update the JACIP each year or whenever a master plan is approved.

Information developed in each airport's CIP must be input into the JACIP by the airport owner/sponsor or a designated representative. Once the CIP is programmed into the JACIP, the airport will be eligible to receive grant money for appropriate projects. The airport sponsor and the FDOT District representative will annually discuss the projects and the timing of projects in the JACIP. Once an airport's CIP projects are programmed into the JACIP, this is not a guarantee of funding. Each year FAA and FDOT projects are funded based on their respective priorities and the funds appropriated by their legislative bodies.

5. Inventory of Non-Standard Features

A non-standard feature is any airfield or airport feature that does not meet the requirements set forth by the FAA. Examples of non-standard features include objects in the Object Free Area (OFA), taxiway and runway separation, runway markings, etc. Non-standard features are most common in airfield design criteria. These non-standard features need to be identified. Generally, the FAA and the State of Florida will require that any non-standard features be documented and a plan filed to achieve future compliance with airfield standards.

6. Facilities in Non-Compliance with Florida Administrative Code Rule 14-60

Florida Administrative Code (FAC) Rule 14-60 provides standards for airports, airport markings, and airport lighting, as well as airspace protection with respect to the licensing of Florida airports. The requirements for airport sites are given, as well as the procedures for issuance of an airport site approval order. This rule states that an airport owner or lessee of any airport in the state of Florida shall have either an airport license or airport registration prior to the operation of any aircraft at the site.

Mitigation strategies for airports that are found in non-compliance include but are not limited to providing a plan to the state for compliance, noting and providing information to the general public and pilots of all non-compliant features of the airport and operating procedures for safe operations at the airport.

If an audit finds that an airport is in non-compliance, the facility would have 14 days to comply with airport standards or provide a mitigation plan. If the airport is not in compliance after 14 days, and has not filed a mitigation plan, the airport's license and/or registration with the State of Florida will be revoked.

7. Facilities in Non-Compliance with Florida Statute Chapter 333

Chapter 333 of the Florida Statute states that hazards to airport operations endanger the lives and property of the users of the airport and of the occupants of land in its vicinity. A hazard as defined in the statute is:

> Any structure or tree or use of land which would exceed the federal obstruction standards as contained in 14 CFR Section 77.21, 77.23, 77.25, 77.28, and 77.29 and which obstructs the airspace required for the flight of aircraft taking off, maneuvering, or landing or is otherwise hazardous to such taking off, maneuvering, or landing of aircraft for which no person has previously obtained a permit or variance pursuant to FL Chapter 333.025 or 333.07.

Outlined within this statute are airport zoning requirements, procedures for the adoption of zoning regulations, and the review and enforcement of the regulation. It also provides airspace protection standards and the procedures for any proposed construction that could possibly exceed Federal obstruction standards.

Mitigation of these hazards must be undertaken; however, mitigation measures may still affect the operational capabilities of the facility. All zoning requirements are to be "reasonable" in nature and should require the removal, lowering, or other changes to any structure, tree, or other obstruction not conforming to the regulations. Mitigation of obstructions can include lighting of the obstruction, as well as providing notes in the A/FD (Airport Facility Directory), and NOTAM's (Notice to Airmen). Common mitigation practices for trees off airport property include, getting an avigation easement of the property and either replacing or trimming the tree.

The airport sponsor is responsible for coordination and mitigation plans to remove any airspace hazards to the airport. As specified in Rule 14-60.007 of the Florida Administrative Code, if an aviation facility fails to meet minimum licensing standards, the facility's operational capabilities may be adversely affected. In order to meet licensing standards, the facility may be required to displace the runway threshold, shorten a runway, or may be issued a limited or special license, or any combination of those measures. In a worst-case scenario, the airport may lose complete operational capability on the affected runway end.

E. AVIATION FORECASTS

Aviation forecasts provide the basis for deciding both the level of airport capital improvements and the timing for the necessary investments. This section addresses approaches and products.

1. Forecast Purpose

Before developing new aviation forecasts, a decision must be made about specific needs. For example, if an airport activity has been following the forecast activity within 10 percent, new forecasts probably are not needed unless significant demographic or economic changes in the community are anticipated. For example, these changes could result from establishment (or departure) of a major regional employer; establishment of new service by a scheduled airline; or anticipated changes in the airport, such as a new fixed base operator facility with flight training. An added tenant such as a military component, a parachute jumping school, a banner tow operation, or active sightseeing flights could also dictate new forecasts. If the need for new forecasts is evident, these forecasts need to be compared to the FAA Terminal Area Forecast, if one is published. If the new forecasts show more than a 10 percent divergence from the TAF, then those forecasts must be coordinated immediately with the FAA Airports District Office (ADO).

2. Forecast Elements

Aviation activity components to be forecast can be grouped into the following five categories:

- **Based Aircraft:** Forecast of the number of aircraft permanently stationed at an airport, usually by agreement between the aircraft owner and airport management
- **Enplaned Passengers:** Forecast of all revenue passengers boarding aircraft, including originating, stopover and transfer passengers in scheduled and non-scheduled services
- **Aircraft Operations:** Forecast of all aircraft landings and takeoffs
- **Peak Period:** Forecast for a peak period of time, usually an hour that represents the highest number of operations or passengers during the busiest period of the average day of the peak month
- **Vehicles:** Forecast of the number and type of vehicles that will be using the roads, curbs, and parking facilities at an airport

3. Forecast Methodologies

Of these five forecast elements, the principal categories are the based aircraft and passengers forecasts. From these forecasts, the remaining forecasts will be derived.

A variety of methods exists to arrive at an appropriate aviation forecast. While several forecast components and methodologies are listed, only the simpler methodologies are appropriate for most general aviation airports. These methodologies should be applied to the forecasts of based aircraft and enplaned passengers. Depending on the airport, existing forecasts should be reviewed including:

- Florida Aviation Activity Forecast: Developed by FDOT, these include general aviation and non hub commercial service airports
- National Plan of Integrated Airport Systems (NPIAS): Developed bi-annually by the FAA

- Terminal Area Forecasts (TAF): Developed annually by the FAA for each commercial service airport in the United States
- FAA Form 5010s: Forms completed by the respective airports and available through the FAA
- Previous Master Planning Forecasts

For most low-activity airports, such as basic utility or general utility airports, a review of existing forecasts compared to historical data may be sufficient. It should be noted that more methodological complexity does not always produce a better result. For these airports, use of the Florida Aviation Activity Forecasts may be sufficient. If additional analysis is needed, statistical approaches include:

- Calculate the growth rate for the last five years and project this rate for each item to be forecast
- Obtain forecasts of local and/or regional population and apply the growth rates to total based aircraft and/or enplaned passengers
- Develop a straight-line regression forecast based on historical data for total based aircraft and/or enplaned passengers
- Apply a market share percentage tied to either a state forecast or nationwide forecast to each item to be forecast
- Develop a multiple regression prediction model using selected variables such as population and income
- Develop a non-linear regression forecast using a logarithmic model
- Using reasonable judgment, combine portions of several forecasts to arrive at a new trend line.

An example of the Florida Aviation Activity Forecasts from the FDOT aviation office is provided in Figure II-3. Examples of comparative historical forecasts of passenger enplanements are provided in Table II-7 and depicted by Figure II-4. Historical data and current forecasts should be displayed in both tabular and graphical form for based aircraft, operations, and enplaned passengers. Similarly, Table II-8 and Figure II-5 present examples of forecasts for a commercial service airport. For these forecasts, historic data and selected previous forecasts should be included for comparison. Forecasts should be developed for 5, 10, and 20-year intervals.

Figure II-3
EXAMPLE OF FLORIDA AVIATION ACTIVITY FORECAST

	Airport Name	Daytona Beach International Airport	Ft Lauderdale / Hollywood International Airport	Gainesville Regional Airport	Jacksonville International Airport	Key West International Airport	Melbourne International Airport	Miami International Airport
Historical Aviation Activity	1988	440,571	4,337,560	198,643	1,352,650	163,862	311,816	12,198,778
	1989	420,357	4,307,100	175,084	1,313,529	169,561	299,200	11,450,075
	1990	507,060	4,426,430	216,463	1,355,394	189,889	373,588	12,190,972
	1991	448,409	4,008,600	176,206	1,283,668	194,780	339,271	12,759,093
	1992	443,198	4,109,796	197,373	1,340,963	202,063	348,777	12,587,420
	1993	410,700	4,512,638	183,009	1,419,663	219,540	321,125	14,030,586
	1994	407,129	5,240,910	191,792	1,944,628	251,288	327,215	14,742,476
	1995	356,728	4,787,467	179,826	1,779,812	246,064	293,498	16,065,673
	1996	390,357	5,543,683	164,729	1,833,378	275,911	319,825	16,338,062
	1997	379,627	6,088,000	178,643	2,119,640	269,764	289,641	16,579,269
	1998	303,911	6,163,686	142,995	2,295,438	250,498	259,426	16,296,212
	1999	275,231	6,932,142	152,087	2,445,231	275,909	273,813	16,531,295
	2000	264,438	7,817,173	144,078	2,616,211	292,508	262,004	16,489,341
	2001	252,367	8,015,055	119,995	2,523,809	261,809	262,069	14,941,663
	2002	234,558	8,266,788	130,683	2,462,399	272,440	201,247	14,020,686
	2003	275,895	8,682,781	120,547	2,415,747	299,193	194,409	14,198,321
	2004	307,295	10,040,598	135,340	2,619,494	298,790	201,148	14,515,591
	2005	297,565	10,729,468	171,036	2,890,298	314,075	226,207	15,092,763
	2006	262,503	10,204,579	153,532	2,971,953	294,047	162,079	15,664,791
	2007	340,328	11,079,250	142,068	3,138,015	270,781	137,102	16,194,162
	2008	282,784	11,020,091	136,623	2,965,973	231,339	145,117	16,377,488
Forecast of Aviation Activity	2009	288,440	11,339,674	140,722	3,051,986	237,122	153,824	16,863,899
	2010	294,208	11,668,524	144,943	3,140,494	243,051	163,053	17,364,757
	2011	300,093	12,006,911	149,292	3,231,568	249,127	172,837	17,880,490
	2012	306,094	12,355,112	153,770	3,325,284	255,355	183,207	18,411,541
	2013	312,216	12,713,410	158,384	3,421,717	261,739	194,199	18,958,364
	2014	318,461	13,082,099	163,135	3,520,947	268,282	205,851	19,521,427
	2015	324,830	13,461,480	168,029	3,623,054	274,989	218,202	20,101,214
	2016	331,327	13,851,863	173,070	3,728,123	281,864	231,294	20,698,220
	2017	337,953	14,253,567	178,262	3,836,238	288,911	245,172	21,312,957
	2018	344,712	14,666,920	183,610	3,947,489	296,133	259,882	21,945,952
	2019	351,606	15,092,261	189,118	4,061,966	303,537	275,475	22,597,746
	2020	358,638	15,529,936	194,792	4,179,763	311,125	292,004	23,268,899
	2021	365,811	15,980,305	200,635	4,300,976	318,903	309,524	23,959,986
	2022	373,127	16,443,733	206,655	4,425,705	326,876	328,096	24,671,597
	2023	380,590	16,920,602	212,854	4,554,050	335,048	347,781	25,404,344
	2024	388,202	17,411,299	219,240	4,686,118	343,424	368,648	26,158,853
	2025	395,966	17,916,227	225,817	4,822,015	352,010	390,767	26,935,771
	2026	403,885	18,435,797	232,592	4,961,854	360,810	414,213	27,735,763
	2027	411,963	18,970,436	239,569	5,105,747	369,830	439,066	28,559,515
	2028	420,202	19,520,578	246,756	5,253,814	379,076	465,410	29,407,733
	CAGR 1988 - 2008	-2.19%	4.77%	-1.85%	4.00%	1.74%	-3.75%	1.48%
	CAGR 2009 - 2028	2.00%	2.90%	3.00%	2.90%	2.50%	6.00%	2.97%

Source of Historic Data a) 1988-1991 FAA TAF b) 1992-2008 FAA ACAIS Database, Revenue Enplanement Report

Figure II-3
EXAMPLE OF FLORIDA AVIATION ACTIVITY FORECAST *(continued)*

	Airport Name	Northwest Florida Regional Airport / Eglin AFB	Orlando International Airport	Orlando Sanford International Airport	Palm Beach International Airport	Panama City-Bay County International Airport	Pensacola Regional Airport	Sarasota / Bradenton International Airport	Southwest Florida International Airport
Historical Aviation Activity	1988	142,638	8,072,822	-	2,498,532	100,801	401,097	870,840	1,491,601
	1989	152,505	8,390,709	-	2,525,195	82,907	395,054	815,423	1,547,626
	1990	162,426	8,683,491	2	2,786,973	93,250	433,766	1,025,965	1,780,766
	1991	156,274	8,712,084	-	2,529,640	94,653	436,815	954,157	1,696,072
	1992	182,859	9,989,092	1,080	2,514,095	135,991	459,933	882,365	1,692,442
	1993	179,998	10,246,596	24,495	2,538,353	159,012	436,421	877,433	1,815,112
	1994	185,216	10,689,225	10,352	2,774,755	151,076	575,797	864,108	1,967,036
	1995	179,703	10,583,166	4,694	2,699,227	147,452	544,486	773,328	1,992,443
	1996	213,108	12,261,366	279,077	2,826,256	149,276	549,057	794,234	2,109,238
	1997	258,929	13,044,802	500,969	2,898,035	158,103	571,237	819,983	2,191,934
	1998	275,823	13,180,324	592,698	2,934,447	158,471	570,833	775,484	2,284,930
	1999	351,935	14,026,868	426,570	2,877,039	164,426	544,979	763,215	2,418,587
	2000	396,743	14,831,648	508,092	2,928,658	169,369	524,811	743,603	2,574,322
	2001	375,196	13,622,397	645,944	2,954,015	161,877	520,953	590,391	2,596,005
	2002	324,962	12,921,480	648,144	2,716,514	164,607	665,881	563,625	2,551,187
	2003	347,645	13,375,162	619,894	3,011,968	182,027	689,268	533,045	2,906,367
	2004	380,871	15,270,347	926,820	3,281,656	189,565	734,921	562,398	3,320,019
	2005	388,778	16,592,133	789,795	3,496,936	188,318	815,157	656,007	3,701,665
	2006	350,484	16,807,534	915,135	3,418,310	173,211	807,069	712,379	3,764,223
	2007	381,992	17,614,679	985,597	3,475,345	159,948	832,158	782,497	3,986,928
	2008	373,808	17,288,480	927,188	3,232,009	161,236	771,917	753,126	3,770,681
Forecast of Aviation Activity	2009	384,275	17,789,846	1,017,881	3,338,665	166,315	804,338	784,004	3,917,738
	2010	395,034	18,305,751	1,065,721	3,448,841	171,554	838,120	816,148	4,070,529
	2011	406,095	18,836,618	1,115,810	3,562,653	176,958	873,321	849,610	4,229,280
	2012	417,466	19,382,880	1,168,253	3,680,221	182,532	910,000	884,444	4,394,222
	2013	429,155	19,944,984	1,223,161	3,801,668	188,282	948,220	920,707	4,565,597
	2014	441,171	20,523,388	1,280,650	3,927,123	194,213	988,045	958,456	4,743,655
	2015	453,524	21,118,566	1,340,840	4,056,718	200,330	1,029,543	997,752	4,928,657
	2016	466,223	21,731,005	1,403,860	4,190,590	206,641	1,072,784	1,038,660	5,120,875
	2017	479,277	22,361,204	1,469,841	4,328,879	213,150	1,117,841	1,081,245	5,320,589
	2018	492,697	23,009,679	1,538,924	4,471,732	219,864	1,164,790	1,125,576	5,528,092
	2019	506,492	23,676,960	1,611,253	4,619,299	226,790	1,213,712	1,171,725	5,743,688
	2020	520,674	24,363,591	1,686,982	4,771,736	233,934	1,264,688	1,219,766	5,967,691
	2021	535,253	25,070,136	1,766,270	4,929,203	241,303	1,317,804	1,269,776	6,200,431
	2022	550,240	25,797,170	1,849,285	5,091,867	248,904	1,373,152	1,321,837	6,442,248
	2023	565,647	26,545,287	1,936,201	5,259,899	256,744	1,430,825	1,376,032	6,693,496
	2024	581,485	27,315,101	2,027,203	5,433,475	264,832	1,490,919	1,432,449	6,954,542
	2025	597,766	28,107,239	2,122,481	5,612,780	273,174	1,553,538	1,491,180	7,225,769
	2026	614,504	28,922,349	2,222,238	5,798,002	281,779	1,618,786	1,552,318	7,507,574
	2027	631,710	29,761,097	2,326,683	5,989,336	290,655	1,686,775	1,615,963	7,800,370
	2028	649,398	30,624,169	2,436,037	6,186,984	299,810	1,757,620	1,682,218	8,104,584
CAGR 1988 - 2008		4.94%	3.88%	10.52%	1.30%	2.38%	3.33%	-0.72%	4.75%
CAGR 2009 - 2028		2.80%	2.90%	4.70%	3.30%	3.15%	4.20%	4.10%	3.90%

Source of Historic Data a) 1988-1991 FAA TAF b) 1992-2008 FAA ACAIS Database, Revenue Enplanement Report

Figure II-3
EXAMPLE OF FLORIDA AVIATION ACTIVITY FORECAST *(continued)*

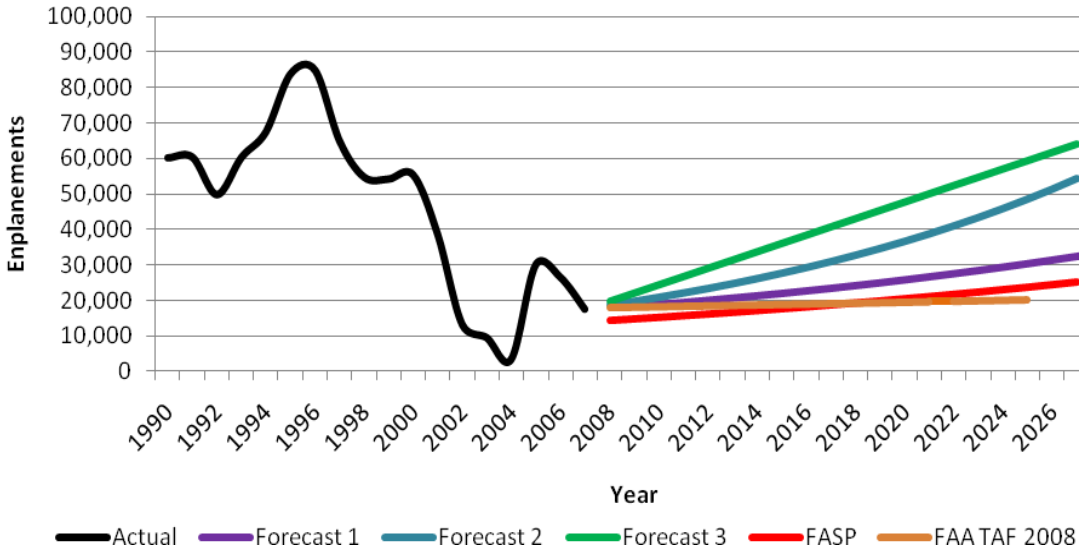
Airport Name		St Petersburg-Clearwater International Airport	Tallahassee Regional Airport	Tampa International Airport	Totals
Historical Aviation Activity	1988	50,208	450,409	4,666,646	37,749,474
	1989	134,485	427,243	4,937,446	37,170,543
	1990	198,305	438,214	4,793,304	40,135,713
	1991	310,449	441,018	5,046,940	39,288,896
	1992	548,462	529,210	5,567,950	40,517,270
	1993	515,385	453,856	6,370,260	43,173,088
	1994	444,604	474,165	6,588,845	47,244,111
	1995	476,610	464,692	6,835,820	47,279,189
	1996	381,730	454,624	7,490,117	51,387,058
	1997	352,899	467,914	7,969,797	53,856,190
	1998	319,243	424,132	7,901,725	54,262,298
	1999	310,650	538,289	7,726,576	56,785,798
	2000	522,308	568,514	7,672,533	59,353,609
	2001	666,904	585,263	8,436,025	56,488,645
	2002	298,647	573,723	9,297,643	54,720,716
	2003	200,972	492,826	9,187,865	56,615,624
	2004	372,283	462,233	9,306,036	62,473,045
	2005	363,725	399,094	8,871,917	66,520,214
	2006	377,328	410,269	9,093,715	66,543,492
	2007	391,440	421,756	9,321,058	69,661,402
	2008	406,080	433,565	9,554,084	68,072,596
Forecast of Aviation Activity	2009	421,268	445,705	9,792,936	76,670,290
	2010	437,023	458,185	10,037,760	78,974,771
	2011	453,368	471,014	10,288,704	81,349,985
	2012	470,324	484,202	10,545,921	83,798,175
	2013	487,914	497,760	10,809,569	86,321,642
	2014	506,162	511,697	11,079,809	88,922,754
	2015	525,092	526,025	11,356,804	91,603,973
	2016	544,731	540,754	11,640,724	94,367,837
	2017	565,104	555,895	11,931,742	97,216,960
	2018	586,238	571,460	12,230,036	100,154,050
	2019	608,164	587,461	12,535,786	103,181,903
	2020	630,909	603,910	12,849,181	106,303,400
	2021	654,505	620,819	13,170,411	109,521,525
	2022	678,984	638,202	13,499,671	112,839,357
	2023	704,378	656,072	13,837,163	116,260,077
	2024	730,721	674,442	14,183,092	119,786,970
	2025	758,050	693,326	14,537,669	123,423,434
	2026				
	2027	10.41%	-0.60%	3.26%	2.99%
	2028	3.74%	2.80%	2.50%	3.02%
CAGR 1988 - 2008					
CAGR 2009 - 2028					

Source of Historic Data a) 1988-1991 FAA TAF b) 1992-2008 FAA ACAIS Database, Revenue Enplanement Report

Table II-7
HISTORICAL ENPLANEMENTS AND FORECASTS - TYPICAL FLORIDA AIRPORT 1

Year	Actual	Forecast 1	Forecast 2	Forecast 3	FASP	FAA TAF 2008
1990	60,184					
1991	60,359					
1992	49,818					
1993	60,317					
1994	67,511					
1995	83,776					
1996	84,855					
1997	64,931					
1998	54,753					
1999	54,200					
2000	55,400					
2001	38,656					
2002	13,265					
2003	9,568					
2004	3,442					
2005	30,055					
2006	26,593					
2007	17,580					
2008		18,227	18,599	19,900	14,403	17,860
2009		18,766	19,676	22,220	14,835	17,994
2010		19,341	20,816	24,541	15,280	18,131
2011		19,951	22,023	26,861	15,739	18,268
2012		20,574	23,299	29,181	16,211	18,405
2013		21,234	24,649	31,501	16,697	18,542
2014		21,910	26,077	33,821	17,198	18,681
2015		22,622	27,588	36,141	17,714	18,823
2016		23,356	29,186	38,462	18,245	18,962
2017		24,126	30,877	40,782	18,793	19,104
2018		24,933	32,667	43,102	19,357	19,249
2019		25,767	34,559	45,422	19,937	19,391
2020		26,629	36,562	47,742	20,535	19,536
2021		27,520	38,680	50,062	21,152	19,685
2022		28,441	40,922	52,383	21,786	19,834
2023		29,392	43,293	54,703	22,440	19,983
2024		30,376	45,801	57,023	23,113	20,134
2025		31,392	48,455	59,343	23,806	20,286
2026		32,442	51,263	61,663	24,521	
2027		33,527	54,233	63,984	25,256	

Figure II-4
HISTORICAL ENPLANEMENTS AND FORECASTS - TYPICAL FLORIDA AIRPORT 1



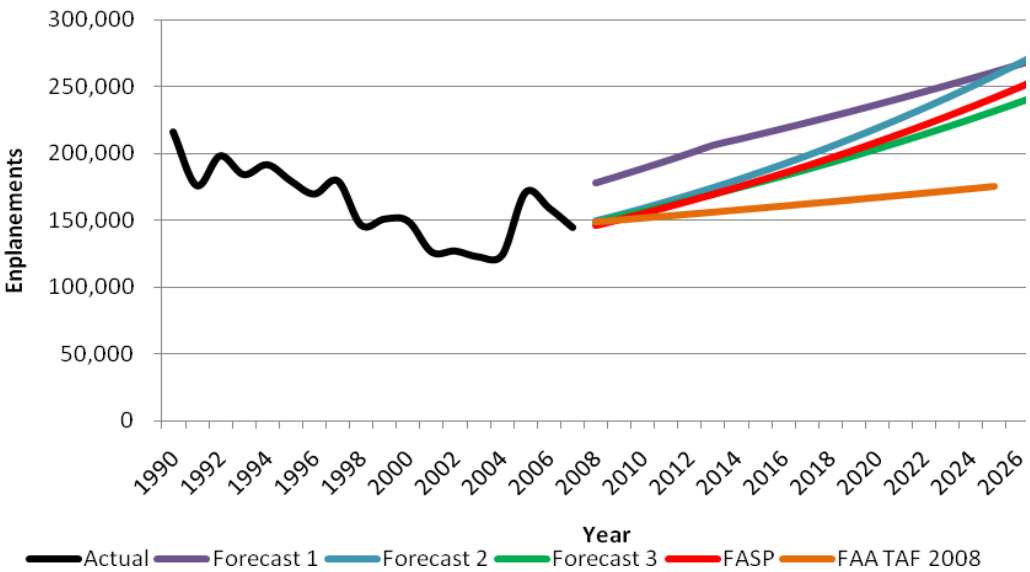
Year	Actual	Forecast 1	Forecast 2	Forecast 3	FASP	FAA TAF 2008
1990	60,184					
1991	60,359					
1992	49,818					
1993	60,317					
1994	67,511					
1995	83,776					
1996	84,855					
1997	64,931					
1998	54,753					
1999	54,200					
2000	55,400					
2001	38,656					
2002	13,265					
2003	9,568					
2004	3,442					
2005	30,055					
2006	26,593					
2007	17,580					
2012		20,600	23,300	29,200	16,200	18,400
2017		24,100	30,900	40,800	18,800	19,100
2022		33,500	54,200	64,000	25,300	n/a
AAGR 2007-2012		3.2%	5.8%	10.7%	-1.6%	0.9%
AAGR 2012-2017		3.2%	5.8%	6.9%	3.0%	0.7%
AAGR 2017-2027		3.3%	5.8%	4.6%	3.0%	n/a

Note: AAGR = Average Annual Growth Rate

Table II-8
HISTORICAL ENPLANEMENTS AND FORECASTS - TYPICAL FLORIDA AIRPORT 2

Year	Actual	Forecast 1	Forecast 2	Forecast 3	FASP	FAA TAF 2008
1990	216,463					
1991	176,206					
1992	198,515					
1993	184,409					
1994	191,948					
1995	179,819					
1996	169,802					
1997	179,753					
1998	146,390					
1999	151,113					
2000	149,492					
2001	126,231					
2002	127,003					
2003	122,570					
2004	123,846					
2005	171,203					
2006	159,315					
2007	144,763					
2008		177,606	150,089	148,603	146,330	148,627
2009		182,934	154,526	152,544	150,719	150,079
2010		188,422	159,267	156,590	155,241	151,545
2011		194,075	164,290	160,743	159,898	153,026
2012		199,897	169,421	165,007	164,695	154,522
2013		205,894	174,854	169,383	169,636	156,033
2014		210,012	180,418	173,876	174,725	157,559
2015		214,212	186,285	178,487	179,967	159,100
2016		218,496	192,325	183,221	185,366	160,656
2017		222,866	198,668	188,081	190,927	162,228
2018		227,323	205,314	193,069	196,655	163,816
2019		231,869	212,182	198,190	202,554	165,420
2020		236,507	219,280	203,447	208,631	167,040
2021		241,237	226,616	208,843	214,890	168,676
2022		246,062	234,197	214,382	221,337	170,328
2023		250,983	242,031	220,068	227,977	171,997
2024			250,128	225,905	234,816	173,682
2025			258,496	231,897	241,861	175,385
2026					249,117	
2027					256,590	

Figure II-5
HISTORICAL ENPLANEMENTS AND FORECASTS - TYPICAL FLORIDA AIRPORT 2



Year	Actual	Forecast 1	Forecast 2	Forecast 3	FASP	FAA TAF 2008
1990	216,463					
1991	176,206					
1992	198,515					
1993	184,409					
1994	191,948					
1995	179,819					
1996	169,802					
1997	179,753					
1998	146,390					
1999	151,113					
2000	149,492					
2001	126,231					
2002	127,003					
2003	122,570					
2004	123,846					
2005	171,203					
2006	159,315					
2007	144,763					
2012		199,900	169,400	165,000	164,700	154,500
2017		222,900	198,700	188,100	190,900	162,200
2027		271,700	276,100	244,400	256,600	n/a
AAGR 2007-2012		6.7%	3.2%	2.7%	2.6%	1.3%
AAGR 2012-2017		2.2%	3.2%	2.7%	3.0%	1.0%
AAGR 2017-2027		2.0%	3.3%	2.7%	3.0%	n/a

Note: AAGR = Average Annual Growth Rate

4. Specific Forecasts

BASED AIRCRAFT FORECAST

The forecast for based aircraft at a general aviation airport or the general aviation component of a commercial service airport begins with a survey of aircraft at the airport. The based aircraft should be defined in terms of single-engine, multi-engine, jet, helicopter, gliders, military and ultra-lights. Multi-engine can be broken down further to piston and turbine powered, if fuel storage is an issue in the study. If the based aircraft tabulation conforms to existing forecast and no immediate changes are foreseen, then using existing forecasts is recommended. This is often appropriate for many basic utility and general utility airports. In Florida, these categories are normally rural airports.

If changes are needed, a new based-aircraft forecast should be provided using a simplified forecast methodology, such as a straight-line regression forecast. Simplified forecast methodologies are appropriate for all levels of general aviation activity, but are particularly appropriate for airports with 50 or fewer based aircraft. If general aviation activity is increasing, several (two to four) forecasts should be developed for comparison. An example of a typical based aircraft forecast can be found in Table II-9.

Table II-9
HISTORICAL BASED AIRCRAFT AND FORECASTS - TYPICAL FLORIDA AIRPORT

	Based Aircraft					Operations				
Year	Single Engine	Jet Engine	Multi-Engine	Helicopter	Other	Local	Itinerant	IFR	Peak Day	Total
1999	24	0	5	0	0	12,000	10,000	0	80	22,000
2000	24	0	5	0	0	12,000	10,000	0	80	22,000
2001	24	0	5	0	0	12,000	10,000	0	79	22,000
2002	19	0	5	0	0	12,000	10,000	0	79	22,000
2003	19	0	3	0	0	10.950	8,500	0	70	19,450
2004	19	0	3	0	0	10,950	8,500	0	70	19,450
2005	19	0	3	0	0	10,950	8,500	0	69	19,450
2006	19	0	3	0	0	10.950	8,500	0	69	19,450
2007	19	0	3	0	0	11,800	6,500	0	60	18,300
2008	20	0	3	0	0	11,800	6,500	0	60	18,300
2009	20	0	3	0	0	12,429	6,500	0	66	18,929
2015	22	0	3	0	0	12,970	7,080	0	70	20,050
2020	23	1	3	0	0	14,320	7,570	0	76	21,890
2030	27	1	1	1	0	17,550	8,550	0	91	26,100

When a new airport is being considered, aviation forecasts do not exist. The Florida Aviation System Plan is a starting point for estimating based aircraft. If a new airport is designated for the general area, then the anticipated role of the airport will give a first indication of initial based aircraft. Even with this indication, additional support data will be required. Surveys of aircraft owners within the targeted county and surrounding counties will be required. Mailing addresses of aircraft owners are available from the FAA aircraft registry database on the FAA's website at www.faa.gov/licenses_certificates/aircraft_certification/aircraft_registry/interactive_aircraft_inquiry/, but that list will likely under-report actual locally owned aircraft, due to owners using corporate addresses and corporate registrations in other states. Therefore, it is best to develop an additional list of potential airport users by contacting FDOT, surrounding airports, property tax offices, and possibly the Aircraft Owners and Pilots Association. Suggested questions to include in this pilot survey are:

- Name
- Home address
- Telephone number
- Type of aircraft
- Home base of aircraft
- Annual takeoffs
- Trip purposes
- Potential for basing at new airport (yes, no, possibly)
- Whether the aircraft would be hangared
- Other comments

A cordial introduction letter and self-addressed stamped return envelope should be enclosed in the mailed survey.

An estimate of the influence area of the general aviation aspects of an airport can be derived from the home addresses of the based aircraft owners.

ENPLANED PASSENGERS FORECAST

The principal passenger component used for forecasting is the enplaned passenger measure. For low volume airports, such as basic or general utility airports, passenger forecasts are recommended, especially if a new or expanded terminal building is anticipated within the 20-year planning period.

At commercial service airports, the enplaned passenger components are the basis from which other forecasts are derived. General aviation passengers and commercial airline passengers are to be quantified and analyzed separately.

The first step in establishing an enplaned passenger forecast for a commercial service airport is a review of existing forecasts. In addition to these forecasts, enplanement data is normally available as part of on-going commercial service airport records. This data can be supplemented by tower or flight service station information if these facilities are active at the airport. U.S. DOT/Transportation System Center databases will also contain enplanement data for large certificated route air carriers, commuters or small certificated air carriers, and air taxi/ commercial operators.

Given historic enplanement forecasts and enplanement trends, a new enplanement forecast, if warranted, can be projected. For commercial service airports, several (two to four) forecasts should be developed for comparison. Selection of forecast methodologies could come from any

of the suggested procedures in Section II.E.4 or other valid approaches.

As part of the passenger forecast process, monthly passenger arrivals, monthly passenger enplanements, passenger enplanements by airlines, and origin-destination passenger markets should be tabulated. These tabulations will assist in identifying market trends and peak-period anomalies that may affect forecasts. However, note that commercial service airports in Florida serving strong tourist destinations are often subject to significant variations in passengers due to seasonal effects, as well as frequent airline equipment market adjustments.

AIRCRAFT OPERATIONS FORECAST

An aircraft operation is a landing or a take-off. For example, a transient aircraft landing for fueling and then taking off for another destination performed two operations.

At towered airports, historical aircraft operations data can be obtained from the Air Traffic Control (ATC) log or other similar data. Numerous methods can be used to develop operations forecasts for towered airports. Three methods are:

- Market share forecasting – This method calculates the current airport activity as a share of an external measure for which the forecast has already been produced (Local, State, FAA, etc.)
- Econometric forecasting – This method is a multistep process that involves a set of variables which can be used to forecast future values. This method is relatively complex.
- Time series forecasting – This method involves extrapolation of existing historical activity data.

Most of the airports in Florida are non-towered, and the methodology to forecast aircraft operations is different from towered airports. At low activity airports (i.e., basic and general utility), the Florida Aviation Activity Forecasts with possible minor modifications aircraft operation forecasts can be used.

Non-towered airports typically rely on the trend extrapolation methodology, a variation of times series forecasting; and market share forecasting. Trend extrapolation is an analysis used to find a base trend line and continue the trend into the future. Market share forecasting involves tying the local activity to a share of some larger aggregate forecast.

Recently, the Airport Cooperative Research Program (ACRP) produced two studies about current forecast methods. One of these reports, *Airport Aviation Activity Forecasting*, identifies one method of operations forecasting by identification of a relationship between operations and an independent factor, like fuel sales or based aircraft. This method can lead to inaccurate estimates, if the relationship between the operations and independent factor are unpredictable. The most accurate method currently in use is to use an aircraft traffic counter(s) at an airport year-around. The least accurate method is interviewing the airport manager or airport staff. Another method is to sample 14 consecutive days, seasonally (four times a year). Acoustical detection and video image detection are two additional ways to sample aircraft traffic, for forecast use.

To arrive at the general aviation component of a new operation forecast for non-towered airports, one approach to calculate total operations per based aircraft. As a rule of thumb, a general aviation complex generates between 500 and 700 operations per based aircraft.[1] This

[1] Operations per based aircraft can fluctuate widely with changing conditions at the local airport, such as the opening or closing of a flight school, local short-term economic factors that affect tourism, and local/regional fuel prices.

level assumes standard fixed-based operator services and a runway of approximately 4,000 feet in length. Airport activity elements frequently present in Florida that could push the operations per based aircraft beyond 700, e.g., to 1,000 or more, include:

- Competitive pricing of fuel and airport services
- Flight instruction
- Military use
- Reliever effect
- Special tourism attraction
- Existence of a U.S. Customs Port of Entry

At general aviation airports and general aviation sectors of commercial service airports, aircraft operations require forecasting defined in terms of: single-engine, multi-engine, jet, helicopter, and other. Adjustments to the individually defined aircraft operations categories are suggested when using appropriate operations per based aircraft factor as a total operations guide. For example, if a flight training school is active at an airport, a higher level of single-engine aircraft operations is justified. Similarly, if business activity exists, then increased multi-engine and/or jet aircraft operations are justified.

Aircraft operations forecasts at commercial service airports will include the general aviation forecasts as previously described, as well as additional air carrier and air taxi/commuter airline operations illustrated by Table II-10. Historic aircraft operations data is documented in both state and FAA sources as shown in Section II.E.1 of this Guidebook.

Table II-10
HISTORICAL AIRCRAFT OPERATIONS AND FORECASTS - TYPICAL FLORIDA AIRPORT

	Air Carrier		Air Taxi/Commuter		GA Local		GA Itinerant		Military		Total	
Year	Historical	Forecast	Historical	Forecast	Historical	Forecast	Historical	Forecast	Historical	Forecast	Historical	Forecast
1992	17,248		18,574		26,790		33,973		26,588		113,620	
1997	13,202		25,346		25,456		35,371		25,794		125,169	
2002	11,467		20,617		34,062		37,029		26,997		130,172	
2007	11,231		27,141		28,042		28,003		14,219		108,636	
2012		11,700		39,900		36,800		36,800		15,200		140,400
2017		14,100		34,600		45,700		45,600		16,200		156,200
2027		19,400		36,500		66,100		66,000		18,400		206,400

Source: _____

With this information, aircraft operations could be forecast using standard forecast methodologies previously described. However, for continuity, air carrier, regional airline, and charter operations should be projected in concert with an estimate of future aircraft equipment. To arrive at this estimate it will be necessary to develop a forecast mix of aircraft types tied to previously forecast enplanement levels using appropriate aircraft seat capacities and airplane load factors. This estimate will also assist in the sizing of the airline apron, the development of terminal facilities, and, if necessary, noise modeling efforts. Forecasts for military operations should be derived directly from the historical operations data.

PEAK PERIOD FORECASTS

Peak-period operations forecasts for low activity and medium activity general aviation airports (i.e., basic utility, general utility, and transport) can simply include the Florida Aviation Activity Forecasts' peak-day operations as a base. Otherwise, peak-hour forecasts can be assumed 20 percent of the peak-day. In lieu of peak-day data for general aviation, normally it can be assumed that the peak-day is 20 percent higher than the average-day. Caution should be taken with this methodology for Florida airports serving tourist destinations. Tourist aviation demands fluctuate widely, thereby suggesting that specific supplemental surveys may be necessary to establish peak-month and peak-day activity. When planning for a small general aviation terminal, a forecast of peak-hour transient passengers plus some percentage of local passengers will be needed. Factors for persons per aircraft could range from 1.8 for single-engine aircraft to 3.1 for higher performance aircraft. Given the peak-hour passengers (including pilots), a terminal size estimate can be derived by multiplying a minimum of 50 square feet by this peak estimate. Caution is necessary when the final terminal building size is developed if functions other than pilot and passenger service are also to be located in the terminal (e.g., flight training, aircraft sales, economic development offices, etc.).

Peak period forecasts at commercial service airports are likely needed for runway capacity estimates, commercial passenger terminal sizing, and air carrier apron sizes. For several estimates, the design-hour (defined as the peak-hour of the average-day of the peak-month activity level) is needed. An example of an estimate of typical peak-month and peak-hour passengers is shown on Table II-11 and Table II-12. To support this data, historical comparisons of enplanements and deplanements, as well as monthly enplanements are helpful.

Peak-hour forecasts are also required to determine commercial carrier apron requirements. Table II-13 illustrates an estimate of apron gate requirements. A graphic display or table illustrating airline schedules can assist in this forecast.

Table II-11
PEAK MONTH ENPLANEMENTS - TYPICAL FLORIDA AIRPORT

	Average Peak-Month Enplanements			
Year	Annual Enplanements	Average Month [1]	Peak Month [2]	Average Day/Peak Month [3]
2007	828,769	69,064	89,783	2,896
2012	752,100	62,680	81,480	2,630
2017	837,600	69,800	90,740	2,930
2027	1,016,400	84,700	110,110	3,550

[1] Division of annual enplanements by 12
[2] Increase of average month by 30 percent
[3] Division of peak-month passengers by 31

Table II-12
PEAK PERIOD PASSENGER FORECASTS - TYPICAL FLORIDA AIRPORT

Year	Enplanements/ Deplanements [1]	Average Month [2]	Peak-Month [3]	Daily Peak-Month [4]	Typical Peak Hour [5]
2007	144,763	12,064	15,683	506	101
2012	171,900	14,330	18,630	600	120
2017	199,300	16,610	21,590	700	140
2027	266,600	22,220	28,890	930	190

[1] Enplanements and deplanements were determined to be virtually equal
[2] Division of total passengers by 12
[3] Increase of average monthly passengers by 30 percent
[4] Division of peak-month passengers by 31
[5] Multiplication of daily peak-month passengers by 20 percent

Table II-13
PEAK HOUR GATE REQUIREMENTS - TYPICAL FLORIDA AIRPORT

Year	Arrivals	Departures	Gate Requirements	Typical Aircraft
2007	2	2	2	RJ-50 (1)
2012	3	3	3	RJ-50 (3)
2017	4	3	4	RJ-50 (2)
2027	4	5	5	RJ-50(5)

Note: Parentheses indicate number of aircraft in peak hour

VEHICLE FORECASTS

At general aviation airports, a factor of 1.3 vehicle spaces per peak-hour passenger will normally satisfy general aviation terminal requirements. This factor assumes an absence of extra functions such as flight training and does not include employee-parking requirements.

For commercial service airports, more in-depth analysis based on forecasts of vehicle use will be required. Table II-14 illustrates this forecast procedure, which assumes a knowledge of vehicle use for an airport. Vehicle use is normally obtained through an enplaned passenger survey. The survey should cover 200 to 400 passengers. From the forecast estimates personal car, rental car, taxi, and van/limo parking can be developed. The personal car estimate can be subdivided further into short-term, long-term, and metered spaces as local practice dictates. Employee parking must be determined outside of this projection.

Table II-14
DAILY VEHICLE USE FORECAST - TYPICAL FLORIDA AIRPORT

	Personal Car	Rental Car	Taxi	Van/Limo
2007				
Average Day Peak Month Enplanements	867	867	867	867
Percent Vehicle Use	59%	33%	7%	1%
Vehicle Use	512	286	61	9
Public Parking Percentage	80%			
Vehicle Use	409	286	61	9
Vehicle Occupancy	1.87	1.51	1.2	5.6
Vehicles Per Day	219	190	51	2
2012				
Average Day Peak Month Enplanements	1,658	1,658	1,658	1,658
Percent Vehicle Use	59%	33%	7%	1%
Vehicle Use	978	547	116	17
Public Parking Percentage	80%			
Vehicle Use	782	547	116	17
Vehicle Occupancy	1.87	1.51	1.2	5.6
Vehicles Per Day	418	362	97	3
2017				
Average Day Peak Month Enplanements	1,753	1,753	1,753	1,753
Percent Vehicle Use	59%	33%	7%	1%
Vehicle Use	1,034	579	123	18
Public Parking Percentage	80%			
Vehicle Use	828	579	123	18
Vehicle Occupancy	1.87	1.51	1.2	5.6
Vehicles Per Day	443	383	102	3
2027				
Average Day Peak Month Enplanements	1,854	1,854	1,854	1,854
Percent Vehicle Use	59%	33%	7%	1%
Vehicle Use	1,094	612	130	19
Public Parking Percentage	80%			
Vehicle Use	875	612	130	19
Vehicle Occupancy	1.87	1.51	1.2	5.6
Vehicles Per Day	468	405	108	3

Curb front is the area along the terminal side of the access road. Curb front analyses are separate studies requiring vehicle dwell time surveys and traffic congestion comparisons. Vehicle traffic consultants normally conduct these studies. Standard two-lane paved roadways

typically provide access for all levels of general aviation airports, as well as passenger transport, commercial, and primary airports.

AIR CARGO FORECAST
Usually, air cargo forecasts will be applicable only at commercial service airports. Airport records should contain information on mail and air cargo tonnage. Normally, projecting historical trends will accommodate this forecast requirement for small commercial service airports.

LABOR ESTIMATES
If forecasts from the FDOT or the FAA are used, the cost will be minimal and will only include the time to download and print it. If a consultant is retained to develop new forecasts to account for special conditions, Table II-15 provides estimates on the amount of work required.

Table II-15
TYPICAL HOURS TO DEVELOP NEW FORECASTS ELEMENT

Airport Role	Hours to Develop New Forecasts
Basic Utility	40 to 80
General Utility	60 to 100
Transport (General Aviation)	80 to 120
Transport (Reliever)	80-120
Passenger Transport (Commercial)	100-150[1]
Passenger Transport (Primary Commercial)	150-200[1]

[1] If on-site passenger surveys are required, an additional 30 to 60 hours should be added.

5. Steps in the Forecast Process

The methodologies used to develop the forecasts need to be appropriate to the airport for which they are being developed. They do not need to be overly elaborate in order to address the issues. Nor do all forecasts need to be run for every airport. For general aviation airports where the only development issue may be the extension of the runway, the forecasts should focus on general aviation operations and the general aviation fleet characteristics. Large and medium hub airports will need to run additional elements including the peak period operations and enplanement forecasts.

The first step, therefore, is to identify and define the forecast elements that are appropriate to forecast for the airport being studied. This is directly related to the issues that were identified as being the focus of concern for the master plan as identified in the scoping and public involvement elements. For commercial service airports, even if the focus of the master plan is aircraft operations, it is still logical to begin with the enplanement forecasts, which project the number of enplanements and then, using the projected average seats per aircraft and the projected load factors per category, develop the commercial service operations. These should be separated by commuter/air taxi and air carrier operations. Typically, general aviation airports call for based aircraft forecasts and aircraft operations by type forecasts. Table II-16 shows the forecast elements that the FAA requires and additional elements that may be appropriate on occasion.

Table II-16
AIRPORT PLANNING FORECASTS ELEMENTS

Required	Include Where Appropriate
Annual Passenger Enplanements	
Air Carrier (Domestic and International) [1]	On-demand Air Taxi
Commuter	General Aviation
	Helicopter
Operational Factors	
Average Seats/Aircraft [2]	GA Operations per Based Aircraft
Average Load Factor [2]	
Annual Itinerant Aircraft Operations	
Air Carrier	Domestic vs. International Operations
Commuter and Air Taxi	Annual Instrument Approaches
General Aviation (GA)	IFR and VFR Operations
Military	Helicopter
Annual Local Aircraft Operations	
General Aviation	Touch and Go Operations
Military	
Other	
Number of Based Aircraft by Type	Peak Hour Operations by Aircraft Type
Aircraft Operations by Type (Fleet Mix)	Peak Hour Passenger Enplanements
	Air Cargo
	Air Mail

[1] International should be separated only when direct international service is provided.
[2] Estimate separately for air carrier and commuter
Source: FAA, *Forecasting Aviation Activity by Airport*, July 2001,

As part of the existing conditions and inventory master plan element, any previous forecasts done for the airport should have been collected. At a minimum, the Florida Aviation Activity Forecasts for the airport should be obtained from FDOT and the most up-to-date FAA Terminal Area Forecast (TAF) should be downloaded from http://aspm.faa.gov/main/taf.asp. The TAF is updated annually in December. The FAA also annually publishes two major forecasts that could be helpful in developing the study airport's forecast, the *FAA Aerospace Forecasts* and the *FAA Long-Range Aerospace Forecasts*. These can be found at the following web addresses:

- http://www.faa.gov/data_research/aviation/aerospace_forecasts
- http://www.faa.gov/data_research/aviation/long-range_forecasts

Forecasts for the airport done as part of previous master plans should also be collected and reviewed where feasible.

The next step is to gather and verify data. It is important to get enough baseline or historical data as possible, but it is even more important to verify that the data is true and accurate. No matter how sophisticated later modeling may be, if the data is incorrect, the accuracy of the results will be questionable. The U.S. Department of Transportation (U.S. DOT) and the FAA are both excellent sources for historical aviation activity data. Table II-17 identifies specific U.S. DOT and FAA sources of data for various elements of the forecast.

Table II-17
HISTORICAL AVIATION DATA SOURCES

Data Source	Information	Website
Operations		
FAA Air Traffic Activity Data System (ATADS)	Historical air traffic activity for Air Route Traffic Control Centers and Contract Towers	http://aspm.faa.gov/opsnet/sys/Main.asp?force=atads
FAA Terminal Area Forecast	Itinerant, local, air carrier, commuter, general aviation and military operations	http://aspm.faa.gov/main/taf.asp
FAA Form 5010	Aviation activity reported by the airport to the FAA ADO	http://www.faa.gov/airports/airport_safety/airportdata_5010/
Passengers		
U.S. DOT Form T-100	U.S. Domestic and International Enplanements	http://www.bts.gov/programs/statistical_policy_and_research/source_and_accuracy_compendium/form41_schedule.html
U.S. DOT Form 298-C	Commuter Enplanements	http://www.bts.gov/xml/air_traffic/src/index.xml#CustomizeTable
U.S. DOT Bureau of Transportation Statistics (BTS)	Maintains U.S. DOT passenger databases, as well as commercial data service providers	http://www.bts.gov/programs/airline_information/sources/
Based Aircraft		
FAA Terminal Area Forecasts	Based Aircraft historical data	http://aspm.faa.gov/main/taf.asp
FAA Form 5010	Current number of based aircraft	http://www.faa.gov/airports/airport_safety/airportdata_5010/
GCR & Associates	Form 5010 data	http://www.gcr1.com/5010web/
AirNav	Form 5010 data	www.airnav.com
Fleet Mix		
Official Airline Guide	Flight schedules and aircraft	www.oag.com
U.S. DOT Form T-100	U.S. Domestic and International Fleet Mix data	http://www.bts.gov/programs/statistical_policy_and_research/source_and_accuracy_compendium/form41_schedule.html
Peak Hour Activity		
Official Airline Guide	Flight schedules and aircraft	www.oag.com
U.S. DOT Form T-100	U.S. Domestic and International Fleet Mix data	http://www.bts.gov/programs/statistical_policy_and_research/source_and_accuracy_compendium/form41_schedule.html

Socioeconomic data for the local and regional area of the airport is usually very helpful in developing the airport's forecasts. This data typically includes the historical and forecast data for population, per capita personal income, and employment. It is essential to obtain this data from a recognized source as the reliability and faith in the resulting forecast will depend on the veracity and reliability of the data with which it is developed. Below is a list of a few but by no means all of the sources from which such data can be obtained.

- University of Florida Bureau of Economic and Business Research (BEPR) www.bebr.ufl.edu
- U.S. Census, Washington, DC, (www.census.gov)
- Bureau of Economic Analysis (www.bea.doc.gov)
- NPA Data Services, Arlington, VA (www.npadata.com)
- Moody's Economy.com (www.economy.com)
- HIS Global Insight (www.ihsglobalinsight.com)
- Woods and Poole (www.woodsandpoole.com)

The next step is to review and analyze the data. The data needs to be reviewed and analyzed to ensure that there is no unusual information or errors. Such non-valid occurrences could skew the results of the forecast to indicate that these are tending toward normal occurrences, rather than unusual instances. Such non-valid occurrences might include a specific one-time event that perhaps shut down the airport for a period or a large one-time only sporting event that resulted in an unusually high number of enplanements. Such anomalies must be modified or adequately explained.

The next step is to select the appropriate forecasting methodologies for the current master plan study. A number of forecast methodologies should be employed for each forecast to obtain a range of forecasts. The following are but a few of the basic methodologies available for the forecasting of aviation activity:

- **Share of National Enplanements:** This methodology compares the airport's existing share of the U.S. market and projects that same percentage share against the forecast of U.S. enplanements to obtain a forecast of the airport's enplanements.
- **Regression Analysis:** Regression analysis is a statistical technique for analyzing and modeling several variables. It is used to determine how a dependent variable changes when one or more of the independent variable is varied.
- **Trend Analysis:** Trend analysis takes historic trends and forecasts them into the future. In trend analysis, a regression equation is used with time as the independent variable.
- **Comparison with Other Airports:** This technique compares the airport under study with other airports of similar size and relevant characteristics.
- **Exponential Smoothing:** This statistical technique is based on a time series analysis of observations in which more weight is given to recent events or trends.

Once the appropriate forecasting methodologies have been selected, they should be applied to the data that has been collected for the airport under study. Once the methodologies have been tested, the results should be evaluated. One evaluation method is to graph the various forecast results. Another is to compare the airport history and forecast results with the FAA national history and forecast for the same parameter. The forecasts can also be compared to other forecasts that have been run for the same airport, such as the FASP.

The basic test in evaluating the forecasts is to determine if they appear reasonable when compared to other forecasts. If they do not appear reasonable, the forecast methodology should be checked to ensure that it was applied properly. If it was applied properly and it still does not appear reasonable, the methodology should be rejected.

When the forecasts have been evaluated and accepted, the results need to be summarized and documented. Each forecast – such as enplanements, operations, or based aircraft – should be addressed separately. It is helpful to employ graphs to summarize both the forecasts and the history of each element. Briefly describe the methodologies used and any assumptions that were

made. Provide explanations if the forecasts differ substantially from the historical trends of the airport. If the explanation involves substantial increases in operations of a specific aircraft or airline, provide documentation that these increases are indeed likely to occur.

Finally, compare the recently completed forecasts with the most current FAA TAF. The FAA will consider the airport forecasts to be consistent with the FAA TAF if the two differ less than 10 percent in the initial five-year period and 15-percent in the initial 10-year period. The airport forecasts must be submitted to the FAA and FDOT for approval. FAA will not approve the forecasts if they are not consistent with the FAA TAF. Substantial documentation and explanation are necessary to explain major discrepancies.

6. Documentation and Information Sources

Forecasts for individual public airports are available free of charge from at least two sources, the FAA and FDOT. The FAA provides both historical and forecast airport data in the Terminal Area Forecast (TAF). The FAA annually updates the TAF for each commercial service airport in the United States and these can be downloaded from the FAA Policy, Planning, and International Aviation Home Page at http://aspm.faa.gov/main/taf.asp. The historical data is derived from airport 5010 inspections for non-towered airports and towered airports with air traffic control towers. Frequently, the TAF forecast data for small to medium-sized general aviation airports is not refined. In many cases, they are merely extensions of the historical data. Therefore, small airports may need further analysis to develop meaningful forecasts. Two additional FAA publications that can be used are:

- National Plan of Integrated Airport Systems (NPIAS)
- FAA Aerospace Forecasts, Office of Aviation Policy and Plans, Washington, D.C. 20591, FAA-APO-91-1

The NPIAS report provides limited information on based aircraft, airport role, and projected development costs. The FAA Aviation Forecast provides macro forecasts of United States aviation activity. These reports can at times be obtained from the FAA Airports District and/or Washington offices or from the National Technical Information Service in Springfield, Virginia 22151.

Another source of enplanement data is the U.S. DOT/Transportation System Center *Fiscal Year*, ACAIS DATABASE form. This can be obtained from FAA airports district office.

The FDOT provides both historical and forecast airport data from the Florida Aviation Activity Forecast (FAAF) model. This data is available from the FDOT district offices, the FDOT Aviation Office, and from the Internet. The historical data is the same as FAA TAF historical data for individual airports. However, the forecast data is more refined. Each airport's forecasts are generated from multiple regressions on individual county population, per capita income, visitor, and business data. Furthermore, general economic data such as gross domestic product and aircraft financial data trends are considered.

Deliverables from the aviation forecasting effort include a narrative, graphs, tables, and an electronic version of the supporting forecast data.

F. FACILITY REQUIREMENTS

This section evaluates what facilities will be required to accommodate the forecast activity based on the ability of the existing facilities to meet current and future demand. Additionally, assessments are also made to determine if the existing facilities are too antiquated or are not properly located. While some planning guidelines suggest separate demand/capacity and facility requirements sections, it is recommended that they be combined into one section to eliminate duplication and increase comprehension. This section provides a logical format for the accomplishment of the demand/capacity and facilities requirements analysis.

1. Facility Requirements and Labor Estimates

This section will identify tools and standards normally utilized to evaluate facility capacity. However, this introduction suggests the specific issues of individual airports should be understood.

For many master plan studies, estimates of annual demand for air passengers, aircraft operations, cargo, or vehicle trips will be sufficient to identify future facility needs. Planners should be aware, however, that such general estimates can mask substantial seasonal and time-of-day variations in demand; failing to consider these can result in high congestion and low levels of service during peak hours.

To address these problems, planners may wish to consider alternate methodologies for determining peak hour demand, such as the percentile of busy hours throughout the year (for example, 90th or 95th percentile). A facility sized to meet such demands should have sufficient capacity and service levels during 90 percent or 95 percent of the hours throughout the year. The specific percentile will depend on the facility being evaluated, the desired level of service, and the unique demand characteristics of the study airport.

AIRPORT REFERENCE CODE SELECTION

The Airport Reference Code (ARC) selection is defined in FAA Advisory Circular 150/5300-13, *Airport Design as* a coding system used to relate airport design criteria to the operational and physical characteristics of aircraft anticipated to operate at the airport on a continuing basis. The ARC is made up of two components. The first considers the aircraft approach category, which is related to approach speed and the second considers the airplane design group, which is related to the length of the aircraft wingspan. The various approach categories and design groups are presented in Table II-18.

Table II-18
AIRCRAFT APPROACH CATEGORY AND AIRPLANE DESIGN GROUP

Approach Category	Approach Speed
Category A	Speed less than 91 knots
Category B	Speed 91 knots to less than 121 knots
Category C	Speed 121 knots to less than 141 knots
Category D	Speed 141 knots to less than 166 knots
Category E	Speed 166 knots or more
Design Group	**Wing Span**
Group I	Less than 49 feet
Group II	49 feet to less than 79 feet
Group III	79 feet to less than 118 feet
Group IV	118 feet to less than 171 feet
Group V	171 feet to less than 214 feet
Group VI	214 feet to less than 262 feet

Source: FAA AC 150/5300-13 *Airport Design*

The ARC is selected by considering the critical aircraft type, both the present and future role of the airport, and the forecasts of aviation activity as established during the forecast element. Selection of the ARC as a first step in the airport facility requirements element will ensure that proper airport design standards are selected during the remainder of the planning effort. For airports with two or more runways, it may be desirable to design all airport elements to meet the requirements of the most demanding ARC. However, it is more practical to design some airport elements, e.g., a secondary runway and its associated taxiway(s), to standards with a less demanding ARC.

RUNWAY CHARACTERISTICS

The number of runways needed at an airport is influenced by two factors, the annual service volume (ASV) of the runway and taxiway system, as compared to demand, and the wind coverage provided by the runway system. Runway capacity should only be analyzed at airports where it is an issue or at multiple-runway airports where one of the runways might be closed.

Runway capacity can be evaluated using FAA Advisory Circular 150/5060-5, *Airport Capacity and Delay*. At most general aviation airports, the abbreviated method contained in Chapter 2 of Advisory Circular 150/5060-5 will result in a sufficiently accurate ASV. At busier airports, where airfield capacity and delay are an issue, the more detailed methodology contained in Chapter 3 of the Advisory Circular should be used.

In either case, the projected annual aircraft operations level should be compared with the ASV level to determine if adequate airfield capacity exists to meet future demands. Capacity enhancements should be planned if the airfield is anticipated to reach 60 percent of the ASV within the study period. Normally, the FAA recommends construction of additional capacity when the airfield reaches 80 percent of its ASV. Table II-19 illustrates one method of presenting the results of a runway capacity analysis.

Table II-19
RUNWAY CAPACITY ANALYSIS – TYPICAL FLORIDA AIRPORT

Existing Runway Capacity	Twenty-Year Forecast	Twenty-Year Forecast Percent of Capacity Used
Annual ASV 206,000	Annual Operations 128,000	Annual 62%
Hourly VFR [1] Capacity 99	Hourly VFR Operations 64	Hourly VFR 65%
Hourly IFR [2] Capacity 53	Hourly IFR Operations 21	Hourly IFR 40%

[1] Visual Flight Rules
[2] Instrument Flight Rules

At airports with more than one runway, but with no air traffic control tower, the ASV should primarily represent a single runway configuration. The additional potential added capacity of the additional runway(s) will not be realized without the coordination capabilities of an air traffic control tower.

Wind coverage also influences runway needs at an airport. As discussed in FAA Advisory Circular 150/5300-13, *Airport Design*, the acceptable crosswind component is determined by the type of aircraft anticipated to use the airport, as expressed in the ARC. In addition, an airport should provide at least 95 percent crosswind coverage. The crosswind analysis may justify a crosswind runway. At some airports, the analysis may find that not all existing runways are needed to provide adequate crosswind coverage.

It is important to consider wind coverage during both all weather and Instrument Flight Rules (IFR) conditions. Wind persistency during IFR conditions can be used to determine the runway most suitable for an instrument approach. Table II-20 shows one method of presenting the results of a wind persistency analysis.

Table II-20
WIND PERSISTENCY - TYPICAL FLORIDA AIRPORT

All-Weather Conditions		Instrument Conditions	
Runway	Runway Coverage [1]	Instrument Runway	Percent Coverage [1]
Runway 02/20 & 14/32	99.0%	Runway 02	67.4%
Runway 02/20	92.9%	Runway 20	46.5%
Runway 14/32	94.9%	Runway 02/20	96.7%

[1] Considers a 12 mph aircraft crosswind limitation

Runway length and width should be determined and documented using guidance found both in FAA Advisory Circular 150/5300-13, *Airport Design* and FAA Advisory Circular 150/5325-4, *Runway Length Requirements for Airport Design.* The evaluation should consider the requirements of both the primary runway and secondary or crosswind runways.

When considering the future aircraft types anticipated using the airport on a continuing basis, a critical aircraft gross weight and landing gear configuration should be studied. This will assist future pavement design under separate engineering analyses.

AIRSPACE REQUIREMENTS

Selection and documentation of the proper FAR Part 77 surfaces and runway protection zone dimensions will be important in the planning effort, especially in the development of the Airport Layout Plan (ALP) drawing set. Items to be defined include:

- Primary surface width
- Horizontal surface radius

- Approach width at the end
- Approach surface length
- Approach slope
- Runway protection zone inner width
- Runway protection zone outer width
- Runway protection zone length

It should be noted that with Change 4 to FAA Advisory Circular 150/5300-13, *Airport Design*, Runway Protection Zone dimensions no longer conform to FAR Part 77 approach surface dimensions in all cases. If this is the case, approach clearing should be based on FAR Part 77 standards as Advisory Circular 150/5300-13 provides only very limited information with regard to optimum clear approach protection.

Selection and documentation of proper lateral clearances will also be important to the planning and development of the ALP drawing set. Items to be defined include:

- Runway safety area width
- Runway safety area length
- Runway centerline to taxiway centerline distance
- Runway centerline to aircraft parking centerline distance
- Runway object-free area width
- Runway object-free area length
- Taxiway safety area width
- Taxiway object-free area width

A discussion of the need for various types of other facility requirements should be included. Depending on the specific airport under study and associated special issues, minimum items to be considered include:

- Automated Weather Observing System (AWOS)
- Remote Communications Outlet (RCO)
- Visual Approach Descent Indicator (VADI)
- Approach Lighting Systems (ALS)
- Runway End Identifier Lighting (REIL)
- Runway and taxiway lighting
- Apron edge lighting

TERMINAL AREA REQUIREMENTS

The space requirements of a GA terminal building can be based on the projected number of peak-hour pilots and passengers multiplied by a demand factor of between 40 and 100 square feet per peak-hour pilot and passenger. This planning standard should be verified depending on the specific nature of the airport.

Transient aircraft apron requirements can be based on the number of peak-day transient aircraft compared to the apron area requirement to park the average sized transient aircraft. This may range from 360 square yards to 500 square yards per aircraft, depending on the specific nature of the airport and the aircraft it serves.

Based aircraft hangar and tie-down space requirements can be based on an analysis of the number of aircraft by types projected to be based at the airport in the future. As an example, depending on the specific nature of the airport, 50 to 80 percent of the single-engine and multi-engine aircraft owners will prefer hangar space, along with 90 to 100 percent of the turboprop, jet, and rotorcraft aircraft owners.

Facilities to be addressed with regard to the General Aviation terminal areas include:

- General aviation terminal building
- Transient aircraft apron
- Aircraft hangars;
- Aircraft tie-downs

At airports offering scheduled airline service, a specific scope of work should be developed to assess commercial service passenger terminal area needs. Since procedures and requirements will vary, no overall standard is suggested. The terminal building area requirements may be too specific for a master plan and it may be appropriate to provide only the general location and footprint of a future terminal complex. In some situations, a terminal area study will be required to deal with the complex nature of the terminal area. Proprietary computer simulation modeling tools are also available and can be used to evaluate passenger and baggage flow through airport terminals.

The following are some basic principles and items to be evaluated when working on a commercial service passenger terminal. The commercial service passenger terminal complex extends from the aircraft parking positions on the airside interface to the vehicle curbfront on the landside interface.

- Gates and Apron Frontage – Planners should establish requirements that identify the number of aircraft parking positions that will be needed to handle future activity. The mix of aircraft expected during the design hour will determine the lineal feet of apron frontage and the dimensions of the required gates. The parking and storage of ground servicing equipment should also be considered in determining apron frontage requirements.
- Passenger Terminal Building – Within the terminal building itself, requirements are commonly expressed in terms of square feet for major functional elements such as ticket counter area, security checkpoints, departure lounges, concessions, airline operations, baggage claim, baggage makeup, circulation and public space, mechanical space, and the Federal Inspection Services (FIS) where required. Understanding the space requirements of these elements will help planners in designing the configuration of the terminal complex. Planners should prepare estimates of the number of processing units needed for ticket counters, kiosks, baggage claims, and security checkpoints. In some master plans, where terminal building expansion is projected for the long-term, it may be appropriate for the master plan to provide only a general location and footprint of the future terminal building, rather than specific functional area requirements.
- Curbfronts – The length of curbfront required is a function of the modal splits of arriving and departing passengers, dwell time assumptions for the vehicles at the curbfront, and the assignment of different types of vehicles to the curbfront (management of the curbfront). The availability of convenient and inexpensive short-term parking, public transit, and door-to-door shuttles will reduce the amount of curbfront required. To facilitate the flow of traffic in front of the terminal, an assessment of the number of lanes should be conducted.

The role of the airport in the air transportation system will determine what passenger terminal facilities it needs. A major connecting hub, for example, will need terminals that are different from those of an origin and destination airport. Similarly, airports serving major tourist destinations will have special needs.

Information on methodologies that can be used to determine the facility requirements for passenger terminals is available from several sources, including:

- FAA Advisory Circular 150/5360-13, *Planning and Design Guidelines for Airport Terminal Facilities*

- FAA Advisory Circular 150/5360-9, *Planning and Design of Airport Terminal Facilities at Non-Hub Locations*.
- *Airport Development Reference Manual*, published by the International Air Transport Association
- *Measuring Airport Landside Capacity*, published by the Transportation Research Board
- ACRP 03-05, Passenger Space Allocation Guidelines for Planning and Design of Airport Terminals; published by the Airport Cooperative Research Program (ACRP) managed by the Transportation Research Board (TRB).

AIRPORT GROUND ACCESS, CIRCULATION AND PARKING

Ground access requirements should also be considered during the planning study with a brief discussion included in the master plan report. Improvement plans to adjoining highways and roadways should be considered along with needed improvements to on-airport access roads.

General aviation airports (in comparison to air carrier airports) generate a nominal level of ground trips, which generally do not appreciably affect area roadway capacity. However, the projected number of peak-hour vehicle trips associated with the airport should be discussed, along with the design-hour capacity of the connecting roadway(s), and current and projected traffic volume. Consulting with FDOT may determine the effect of airport vehicular traffic on the surrounding roadway system.

Terminal vehicular parking requirements at GA airports can be based on the number of peak-hour vehicles as projected in the forecast section. Normally, a primary space requirement is based on between one and two spaces for each projected peak-hour vehicle, depending on the specific nature of the airport. This factor considers employee parking. Parking requirements for secondary areas, such as near T-hangars, should also be considered.

The main components of the ground access system at commercial service airports are the regional roadway network, on-airport circulation roadways, and parking facilities. The capacity and reliability of this system will determine the level of service provided to air travelers on the ground access segment of their trip.

At airports where ground access may be an issue, detailed discussions with local transportation planners may be needed to quantify the shortfalls in the capacity of the regional roads. Airport planners can use a variety of analytical computer and simulation models to assist with these determinations. Generally, large airports try to develop strategies that reduce the number of single-person private vehicle trips and to encourage greater use of high-occupancy vehicles. In major urban areas, the Metropolitan Planning Organization (MPO) may be able assist airport planners. Light rail systems, intermodal stations, or other alternate modes of transportation are often examined in these efforts.

Various user groups have different patterns of arrival and departure times for airport trips. Analytical methods and computer models may be used to evaluate roadway capacities and the levels of service they provide. Such an analysis should also identify possible capacity increases in the form of additional lanes or operational modifications. Security provisions for vehicle screening may need to be provided. Facilities for non-private vehicles should be evaluated. These facilities may include:

- Taxi/Limo/Courtesy Van Staging Areas – These users need locations where vehicles can be parked and dispatched as needed to pick up passengers at the terminal curbfronts. A staging area is a critical resource at busy airports where terminal curbfront is scarce.

- Rental Car Facilities – At smaller airports, the ready and return parking spaces for rental cars are often located in lots immediately adjacent to the terminal building or in the public parking areas. At larger airports, ready and return spaces may be provided in a consolidated rental car facility or at remote locations that are reached via courtesy vans or buses. Rental car operations also require space for cleaning, fueling, maintenance and vehicle storage.
- Courtesy Vans and Buses Areas– Courtesy buses and vans serving on- and off-airport rental cars, hotels, parking facilities and others are major users of on-airport roadways. At the larger commercial service airports, these are often provided with dedicated curbfronts to pick-up and drop-off passengers.
- Charter Bus Operation Areas – Airports that are major tourist destinations may have to accommodate significant charter bus operations. Cruise ships, for example, impose extraordinary surges on facilities used by charter buses to transfer passengers between the air terminal and the marine port.

Planners should pay close attention to airport signing. Poor signing can reduce the level of service provided to the airport's patrons and cause increased traffic volumes because of recirculation. FAA AC 150/5360-12, *Airport Signing and Graphics,* has instructions on obtaining the industry reference manual, *Guidelines for Airport Signing and Graphics*, which was jointly developed by the American Association of Airport Executives (AAAE), the Airports Council International-North America (ACI-NA), the Air Transport Association of America (ATA), and the Airport Consultants Council (ACC).

GENERAL AVIATION REQUIREMENTS

General aviation includes a variety of users and activities, such as corporate flight departments, cargo operators, recreational users, flight training, agricultural applications, law enforcement, and fixed base operators. These users need aircraft storage facilities, transient parking aprons, terminal facilities, and vehicle parking and access from adjacent roads.

- Aircraft Storage Facilities – The physical requirements for aircraft storage varies from unpaved tie-down aprons to large conventional hangars. Conventional hangars and T-hangars provide aircraft with protection from the weather and security against vandalism or theft. In general, aircraft owners prefer hangars, but the rent is a key determinate of usage. The demand for hangars is understandably higher in northern climates with severe winter weather conditions.
- Transient Aircraft Parking Aprons – Temporary parking and tie-down areas for visiting aircraft may be provided on a transient apron adjacent to the GA terminal building, or on aprons managed or leased by a Fixed Base Operator (FBO).
- GA Airport Terminal Facilities – GA terminal buildings range from very modest structures with little more than a waiting room and a telephone to multi-story buildings with extensive amenities such as pilot briefing rooms, restaurants, gift shops, pilot's lounges, conference rooms, training areas, and rental car counters. The terminal building may also house administrative offices.
- Commercial Service Airport GA Terminal Facilities – At commercial service airports, general aviation terminal facilities are often provided by one or more FBOs. In such cases, the facilities are provided principally for customers of the FBO and access for the public is limited.

The future requirements for GA facilities will be primarily a function of the forecasts of based aircraft and of transient aircraft operations. The role of the airport in the FASP will also influence facility requirements, as will the airport sponsor's vision of the strategic and economic value of

the airport.

Planners should also be aware of factors that may influence the existing demand for these facilities. For example, if the facilities are in disrepair compared to facilities at neighboring airports with overlapping service areas, demand may have shifted away from the study airport. The airport sponsor's pricing policies may also affect the demand. A useful barometer of facility needs, particularly short-term needs, is the existence of waiting lists for hangars, T-hangars, or aircraft tie-down positions.

The number of business jets is increasing at a more rapid rate than other general aviation aircraft. This growth became more pronounced with the introduction of the very light jets (VLJ) or micro jets. While these have suffered some setbacks during the recent recession, small jet activity is expected to grow in popularity as the economy recovers. No matter their size, business jets have notable impacts on the facilities and services of a GA airport. These impacts should be considered in planning.

AIR CARGO REQUIREMENTS

For commercial service airports and larger general aviation airports, air cargo activity includes a diverse collection of companies with differing business strategies and market roles, including the following:

- Integrated Carriers transport freight from door-to-door using their own fleet of trucks and aircraft.
- Freight Forwarders act as brokers that link shippers with freight carriers; they coordinate the shipment of freight, but do not transport it.
- All Cargo Operators sell space to freight forwarders or individual companies and ship the air cargo on their aircraft.
- Combination Carriers carry both passengers and freight on a single aircraft, typically in the baggage compartment of a reconfigured cabin.

Airport planners should assess the capacity of existing cargo processing facilities and determine future requirements for buildings, aircraft parking aprons, and ground access facilities. Each type of cargo operation has somewhat different site requirements, so a range of spaces will need to be provided for cargo development. In planning for future air-cargo facilities, planners should consider:

- The type of cargo companies expected to expand or initiate operation
- Annual air cargo operations projected for all operators
- The number of existing apron parking spaces
- Projected growth in annual enplaned tonnage
- The availability of ground access for the heavy commercial trucks associated with cargo activity
- Any security needs and requirements, especially TSA–2004-19515, *Air Cargo Security Requirements*
- Providing a means of separating cargo trucks from other airport traffic for security purposes

For most general aviation airports, air cargo facilities are included in the broad category of general aviation facilities. Air cargo-related activities are accommodated in the hangar, apron, and ground access facilities of the general aviation tenants and operators. In these cases, an

independent analysis of air cargo needs is unnecessary.

FUEL STORAGE REQUIREMENTS

FBOs often provide fuel storage and supply at general aviation airports. At some airports, unattended self-serve facilities may be provided when activity levels do not warrant full-time attendants. To support general aviation, planners should address the types of approved aviation fuels needed to meet current and future public demand, since new engine technologies permit the use of auto fuel and diesel in certain of today's aircraft.

Fuel storage requirements can be projected for both AVGAS and Jet A fuel by using an average gallons-per-operation factor. This is done by determining the annual amount of recent AVGAS and Jet A fuel sales and comparing fuel flowage with the estimated amount of piston and turbine aircraft operations over the same period. The resulting gallons-per-operation factor can then be applied to the projected number of piston and turbine aircraft operations to estimate future annual fuel flowage.

Fuel must settle and be tested. The number of tanks and their size may also need to be considered. Peak period demand and concern over disruptions of supply (such as after a hurricane) may also influence the fuel storage analysis.

Fuel storage requirements are then calculated based on the number of storage days desired before fuel redelivery is required. Depending on the specific nature of the airport, anywhere from a 7-day to a 45-day fuel storage capability may be desired. Table II-21 shows one method of presenting the results of a fuel-storage analysis.

Table II-21
PROJECTED FUEL DEMAND - TYPICAL FLORIDA AIRPORT

Year	Piston Aircraft Operations	Gallons Per Operation	Annual AVGAS Fuel Demand (Gallons)	Turbine Aircraft Operations	Gallons Per Operation	Annual Jet Fuel Demand (Gallons)
Estimate						
2009	40,000	3.4	138,244	2,100	25.3	53,071
Forecast						
2015	42,550	3.7	157,435	2,450	32.0	78,400
2020	44,800	3.7	165,760	3,100	32.0	99,200
2025	46,850	3.7	173,345	3,550	32.0	113,600
2030	48,800	3.7	180,560	4,100	32.0	131,200
2035	50,950	3.7	188,515	4,450	32.0	142,400

Table II-22 shows a presentation of the projected fuel storage requirements.

Table II-22
FUEL STORAGE REQUIREMENTS - TYPICAL FLORIDA AIRPORT

Year	14-Day AVGAS Storage Requirements (Gallons)	14-Day Jet A Fuel Storage Requirement (Gallons)
Estimate		
2009	5,303	2,036
Forecast		
2015	6,039	3,007
2020	6,358	3,805
2025	6,649	4,357
2030	6,926	5,032
2035	7,231	5,462

SECURITY REQUIREMENTS

Recent events have made security requirements very important in planning airport facilities. Planning for security early in the development process can produce designs that accommodate security requirements in a more efficient, less costly, and less intrusive manner. Security requirements will vary depending on the role and service provided at the airport. The information contained in 49 CFR Part 1542, *Airport Security*, describes the rules and requirements for commercial service airports. Operators of general aviation airports are encouraged to use the recommended guidelines in appropriate TSA publications discussing security at general aviation airports to enhance the security of their facilities. General aviation security and is addressed by the ACRP at:

http://onlinepubs.trb.org/onlinepubs/acrp/acrp_syn_oo3.pdf.

Security fencing is an important facility requirement at all airports, and a fencing plan should be established and shown on the ALP. The fencing plan would show the airport's plans to protect it from unauthorized access. The fencing plan may also address preventing collisions with animals such as deer and other wildlife.

PROPERTY ACQUISITION

Many airports have significant acreage devoted to non-aeronautical uses, such as industrial parks, recreational uses, agricultural or grazing leases, or retail businesses. Some uses are considered temporary, to remain only until a higher aviation use materializes, while others are expected to remain, as the land involved is surplus to anticipated aviation needs. In either case, the revenue from these activities provides supplemental revenue to the airport and improves the airport's overall financial position. The planner should review the infrastructure needs of such activities and identify improvements that preserve the revenue-generating performance of a valuable asset. Property acquisition needs should be considered and discussed for both fee simple and easement acquisition. Guidelines for property acquisition are contained in FAA Advisory Circular 150/5300-13, *Airport Design*.

MAINTENANCE AND REHABILITATION

Since the analysis of facility requirements takes into account existing facilities, the condition of such needs to be estimated. This determination is made in subjective terms: good, fair, or poor. Based on the condition, anticipated maintenance and rehabilitation costs during the planning

period are assessed and included in the capital improvement program. Facilities that need to be examined include airfield pavement, airfield lighting, pavement marking, hangars, the terminal building, parking lots, and access roads.

SUPPORT FACILITIES

Support facilities at an airport provide a broad set of functions that ensure the smooth, efficient, and safe operation of the airport. As applicable, the future requirements for facilities such as aircraft maintenance facilities should be examined:

- The airport provides a wide variety of services to ensure that airport tenants and users have a safe, efficient, and reliable environment. The airport maintenance facilities needed to support these services include administrative offices, buildings for staging and maintenance of airport equipment, shop space, and storage.
- For the general aviation community, aircraft maintenance is typically provided by an FBO. The types of services provided include, but are not limited to, airframe and power plant repair by an FAA-certified repair station. The facilities required to sustain these services include:
    - An aircraft maintenance hangar with sufficient work space for any aircraft upon which maintenance is being performed
    - Suitable storage and shop space for equipment and tools
    - Office space, customer lounge, restrooms, and telephone
    - Apron area with pavement type and strength adequate to support the expected aircraft
    - Vehicle parking and ground access
    - Proximity to the engine run-up area to limit taxi times and fuel costs
- At larger airports, a tenant airline may have established a maintenance base for the periodic inspection and maintenance of their aircraft. To determine the space requirements for such an aircraft maintenance facility, planners should ask airline representatives what types of aircraft they plan to service at the airport and their expected facility needs.
- For corporate aircraft, hangar and administrative facilities are necessary

UTILITIES

The master plan should also address future need for utilities such as water, sanitary sewer, drainage and deicing (if applicable), industrial waste, communications, and power supply. Existing systems should be evaluated and their capacity verified at the airport boundary. Historical ratios of utility demand to the level of enplanements or aircraft operations can form the basis for projecting future demand. Since an airport can be a large consumer of utility services, planners should discuss their projections with local utility providers to ensure that the airport's needs are included in their long-term service plans.

AIRCRAFT RESCUE AND FIRE FIGHTING FACILITIES

For airports that require Part 139 certification, planners should review the forecast of aircraft operations to determine if the airport's Aircraft Rescue and Fire Fighting (ARFF) facility index will change during the planning period. If Part 139 certification is not currently provided at the

study airport, but will be required at some time during the planning period, the applicable ARFF building and equipment requirements should be defined in the master plan. The ARFF Index definitions are shown in 14 CFR Part 139, *Certification of Airports*, particularly sections 139.315 to 139.319. Together with FAA AC 150/5210-15, *Airport Rescue and Firefighting Station Building Design*, these are good sources of information for standards and guidance in planning an ARFF station. Planners should also consider if multiple ARFF stations will be required to meet response time requirements as defined in Part 139. For airports that do not require Part 139 certification, planners should identify any existing agreements with local authorities for emergency response services, or the lack thereof.

LABOR ESTIMATES

Table II-23 estimates the amount of work normally required to complete the introduction, inventory, and data collection elements. Deliverables resulting from this effort include a narrative, tables, and a database of airfield, terminal area, and surface access facility requirements data.

Table II-23
TYPICAL HOURS TO COMPLETE FACILITY REQUIREMENTS ELEMENT

Airport Role	Hours to Develop the Facility Requirements
Basic Utility	40-80
General Utility	60-100
Transport (General Aviation)	60-100
Transport (Reliever)	80-120
Passenger Transport (Commercial)	100-150
Passenger Transport (Commercial Primary)	150-200

2. Emerging Trends

The aviation industry is continually evolving and the changes may have a significant impact on the size, quantity, and type of facilities needed to accommodate future demand. For example, airfield and airspace capacity may be affected by the implementation of free flight, the use of global positioning systems for navigation, the expanded use of regional jets, the introduction of new aircraft types (large commercial and very light jets), and changes in air traffic procedures. Airline mergers, the introduction of self-serve kiosks, advances in information technology, and new security procedures will affect terminal facility requirements. Cargo facility needs have been changed by the improved logistics of the distribution industry, as well as new security requirements.

The rapid pace of change in the aviation industry is expected to continue for years to come. All master planning efforts should examine industry trends and identify those that will influence their capacity needs. An important consideration in airport planning is to encourage flexible concepts that can be adapted to the rapidly changing environment.

3. Incorporation of Statewide Planning Efforts and FDOT Criteria During the Master Plan Preparation Process

Because air transportation is a vital community industry, it is important that during the master plan preparation process that state and local planning officials be contacted. The FDOT district representative will help identify the aeronautical role of existing and recommended future transportation needs. FDOT officials can also help assess future requirements that are going to be recommended to airports in specific roles. Airport master plans completed for public use airports located in Florida must be consistent with the instructions and procedures contained in this document, *Guidebook for Airport Master Planning*. Each master plan must also be consistent with the airport's assigned role in the Florida Aviation System Plan (FASP).

Airport master plans should be coordinated and consistent with the local government comprehensive plan (LGCP). Airport master plans may contain some planning elements that are not consistent with the LGCP in which case these elements should be thoroughly documented in the master plan. Airport master plans submitted to the FDOT for approval that contain undocumented elements inconsistent with the LGCP will not be approved. CIP projects that contain elements that are inconsistent with the LGCP and for which FDOT funding is sought will not be approved until the FDOT funding proposal is removed. FDOT will not participate in the funding of CIP projects that are inconsistent with the local government comprehensive plan.

Airports may elect to have their master plans incorporated into the local government comprehensive plan. In this event, all aviation related development covered in the master plan would comply with the Development of Regional Impact (DRI) review process.

4. Compliance with State Standards

All master plans prepared in the State of Florida will meet all state regulations and standards in accordance with Florida State Law and Administrative Codes. Most of the rules and regulations that affect airports and the planning process are referred to throughout this document and are located in the appendices.

G. DEVELOPMENT AND EVALUATION OF ALTERNATIVES

In many airport planning situations, more than one potential solution or location to develop a needed airport improvement exists. All T-hangars could be provided in one location, or they could be located in several areas around the airport. Runway extension alternatives could include two alternatives showing extensions at either end of the runway and a third alternative could have the proposed extension divided between both ends of the runway. Such alternative decisions are made by conducting an alternative analysis and evaluation process. This process considers various airport development concepts and evaluation factors such as operational efficiencies, costs, and environmental impacts.

Alternatives should be evaluated individually and collectively to make sure that they meet the facility requirements, not only in the amount and in size of the facilities required, but also within the period required. Care must be taken to ensure that the phasing of the alternatives puts the project implementation schedule into a logical order. For example, a new hangar is of little use if there is no roadway, taxiway, or apron to accommodate the hangar.

When developing and evaluating the alternatives, it is essential to document and understand both the environmental considerations and the fiscal issues. Many of the resulting projects will require follow-on environmental review under the National Environmental Policy Act (NEPA), and the master plan must provide sufficient planning and technical data to support the NEPA analysis. The fiscal issues are important because an alternative is not realistic if the airport cannot afford to implement it. However, it must also be acknowledged that, under NEPA, cost alone is not necessarily a valid reason to reject an alternative.

While an alternative might be eliminated in a master plan for fiscal reasons, it must be thoroughly documented within the master plan, because the NEPA analysis may be required to revisit some of the eliminated alternatives. Documentation of eliminated alternatives is important as not only will reviewers question the decision process used to locate airport facilities in future years, but also the documentation will be needed for the National Environmental Protection Act process.

1. Airport Development Concepts

It is essential that an organized approach be taken in developing airport alternatives that meet the actual needs of the airport. The development of alternatives is the culmination of the elements that have gone before in the airport master planning process. The existing conditions define the facilities that exist at the airport today, the aviation forecasts define the demands that will be placed on the facilities in the future, and the facility requirements define what facilities will be required to meet the aviation activity demands. The airport alternatives are developed to meet the projected facility requirements that cannot be met by the existing facilities.

2. Alternatives Analysis Process

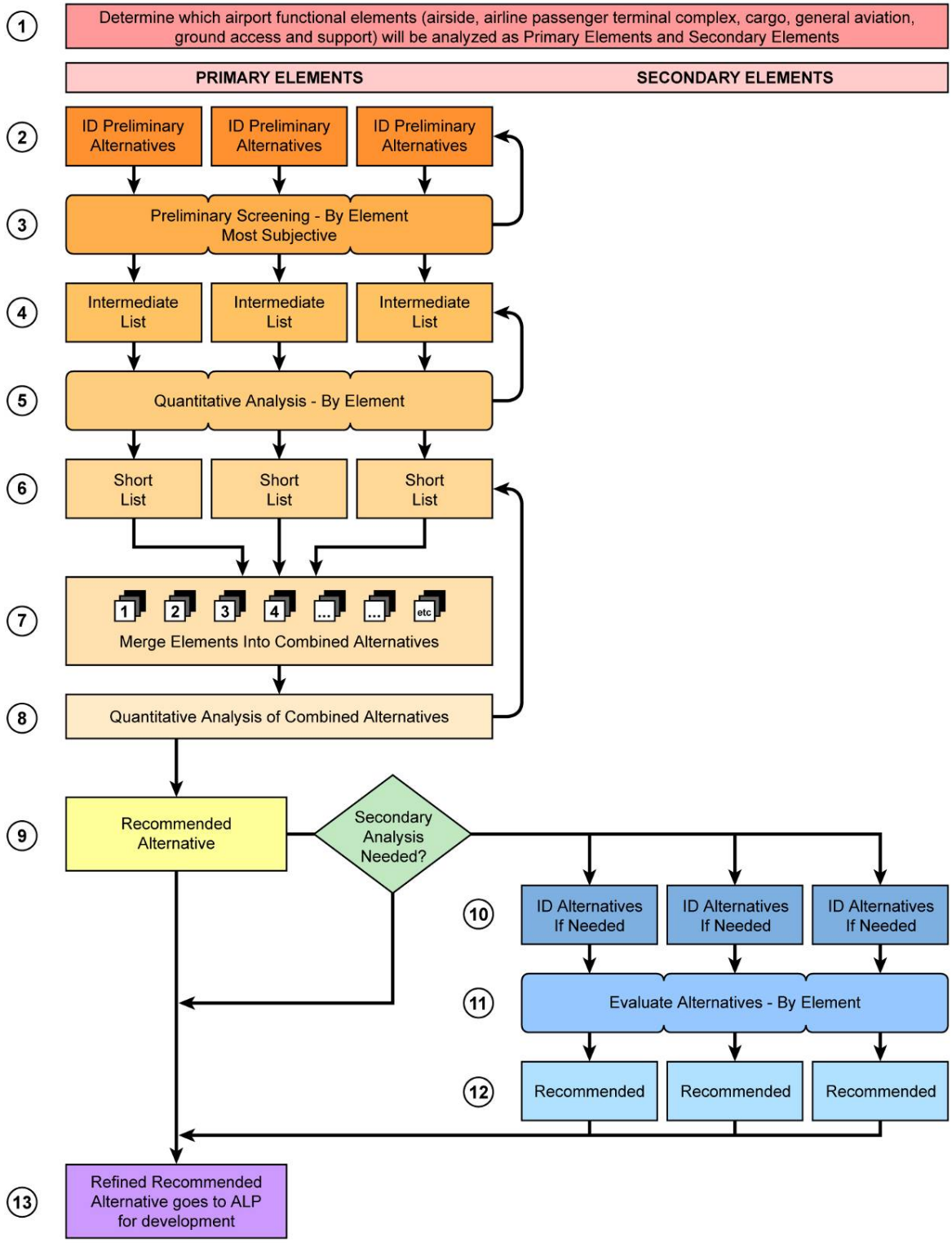
The FAA Advisory Circular 150/5070-6, *Airport Master Plans,* identifies an orderly process of airport alternatives analysis. The comprehensive process is very detailed, but can easily be adapted for use at airports of all sizes. Variations in the process should be defined in the master plan's scope of work to ensure an understanding of the amount of detail that is expected. The level of detail can greatly affect the cost of the master plan study. The scope of work should define the airport elements that are to be included in the process and their relative importance within the master plan, as well as the type and level of analysis to be used to differentiate among the alternatives.

If an airport does not have an airport element and does not plan to add that element, the analysis process should not consider that element. If there are no new facility needs for a particular airport element, it too should be eliminated from the analysis process. If only cursory analysis of one element is needed and a more in-depth analysis of another airport element is desired, this too can and should be accommodated. The process should be adapted to meet the needs of the individual airport and the current master plan study.

The alternatives analysis process is broken into 13 steps as follows and as shown in Figure II-6:

1. **Define Primary and Secondary Elements** – Determine which functional elements of the airport should be considered in the analysis. Primary elements require large areas of land and/or must remain functionally contiguous. Secondary elements are those that have greater planning flexibility. Many airports will have no secondary elements.
2. **Identify Primary Element Alternatives** – Develop alternatives that address the facility requirements of the primary elements.
3. **Preliminary Screening of Primary Element Alternatives** – Evaluate the primary alternatives in a largely subjective process, eliminating some alternatives and introducing new ones as appropriate. Document the reasons alternatives are eliminated to aid future environmental analyses.
4. **Intermediate List of Primary Element Alternatives** – The evaluation process will result in an intermediate list of individual primary element alternatives.
5. **Quantitative Analysis of Primary Element Alternatives** – If appropriate, evaluate the intermediate list of primary element alternatives using a quantitative analysis.
6. **Primary Element Alternatives Short List** – The quantitative evaluation process will result in a short list of individual primary element alternatives.
7. **Merge Primary Elements Into Combined Alternatives** – Once the primary element alternatives have been identified, they should be combined in a logical manner into combined alternatives.
8. **Quantitative Analysis of Combined Primary Element Alternatives** – Once the primary element alternatives have been combined, the resulting airport development concepts should be quantitatively evaluated using many of the evaluation criteria used previously. This may result in additional or modified alternatives. If any alternatives are eliminated, the reasons should be well documented to aid in future environmental analyses.
9. **Select Preferred Primary Element Alternative** – Select and document the preferred combined primary element alternative. Document the reasons for the elimination of the alternatives not selected.
10. **Identify Secondary Element Alternatives** – As required, develop alternatives for any secondary airport elements.
11. **Evaluate Secondary Element Alternatives** – Subject the secondary element alternatives to an appropriate evaluation analysis.

Figure II-6
ALTERNATIVES ANALYSIS PROCESS EXAMPLE



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

12. **Identify Recommended Secondary Element Alternatives** – Select the recommended alternative for each of the secondary element alternatives, making certain to document the reasons the eliminated alternatives were not selected.
13. **Combine Secondary Elements and Primary Elements** – Combine the Preferred Primary Element Alternative and the recommended alternative for each secondary element. The resultant Recommended Airport Development Alternative is then incorporated into the Airport Layout Plan for development.

3. Identification of Alternatives

For master plans at small general aviation airports, airport development may be confined to extending existing land-use patterns. These may best be addressed in the Airport Layout Plan. For larger airports, the development of alternatives can be quite extensive, and efforts will need to be made to ensure that the alternatives remain within the scope of the project and that all of the airport's issues are addressed, not just one or two issues that may overshadow other planning elements. The following general principals should be followed when developing alternatives:

- Consider only those alternatives that meet the airport's planning needs and that the airport sponsor, FDOT, and the FAA will be able to implement.
- Eliminate alternatives that are not operationally, fiscally, or technically sound and document the reasons for the elimination
- Avoid alternatives that are variations on one theme.
- Make sure the alternatives meet the facility requirements
- Concentrate on the airport element alternatives that address the issues of concern for that particular master plan.

4. Evaluation of Alternatives

The evaluation and selection process should be as straightforward and streamlined as possible. The evaluation of alternatives should be adjusted to meet the requirements of the airport and the master plan. It is not always desired or necessary to perform detailed evaluations at every step of the alternatives process. However, at those airports where more than one level of evaluation is warranted, the evaluation process should use increasing levels of detail as the process progresses.

The evaluation criteria should be determined in advance of developing the alternatives, but the criteria can be adjusted as the process evolves. The criteria should be balanced in considering all aspects of the alternatives while considering the important aspects of the master plan study.

There are four broad categories of evaluation criteria. Some aspects of all four categories should be included in each master plan's alternative criteria, but the degree and depth to which they are incorporated will be dependent upon the degree of analysis agreed upon in the scope of work. The four categories of evaluation criteria are:

- **Operational Performance** – Three factors that define operational performance are capacity – the ability of the alternative to accommodate future activity levels; capability – the ability of the alternative to meet specific functional objectives; and efficiency – the ability of the alternative elements to work well together as a system.

- **Best Planning Tenets and Other Factors** – Typical factors in this category may include the following:
  - Meets the intent of FAA design standards and other appropriate planning guidelines
  - Conforms where appropriate to the Local Government Comprehensive Plan, the Florida Strategic Intermodal System (SIS), and the Florida Transportation Plan (FTP)
  - Conforms to best practices for safety and security
  - Provides for the forecast growth throughout the planning period
  - Provides for future growth option beyond the 20-year airport master plan
  - Provides flexibility to meet changing unforeseen circumstances
  - Conforms to the airport sponsor's strategic vision
  - Meets the needs of the users
- **Environmental Factors** – The potential environmental impacts of an alternative and the methodology and effectiveness of addressing the issues
- **Fiscal Factors** – Preliminary cost estimates are very effective at comparing alternatives and should be done for all alternative analyses. Where warranted, early analysis of the airport's fiscal constraints may also be used to compare alternatives.

5. Selection of Recommended Alternative

The level of detail of the development and evaluation of alternatives will vary with each master plan, but it is important that the reasons for the selection of a recommended alternative be fully and clearly documented. In simple evaluations, this may be a summation of the evaluation criteria. With airport development studies that are complex, a matrix of findings can be a simple, yet effective tool in selecting and documenting a recommended alternative. It is essential that all evaluation decisions are documented in the planning report. Figure II-7 illustrates one method of presenting criteria considered in the evaluation process.

Figure II-7
SAMPLE EVALUATION MATRIX

	Alternative				
Criteria	**One**	**Two**	**Three**	**Four**	**Five**
A					
B					
C					
D					
E					
F					
Rank					

6. Airport Development Concepts Labor Estimates and Deliverables

Table II-24 shows estimates for work normally required to develop and evaluate the airport development concepts element. Deliverables resulting from this effort include a narrative, alternatives map, evaluation chart, and criteria quantities in an electronic format.

Table II-24
TYPICAL HOURS TO DEVELOP AND EVALUATE AIRPORT DEVELOPMENT CONCEPTS

Airport Role	Hours to Develop and Evaluate the Airport Development Concepts
Basic Utility	30-80
General Utility	50-100
Transport (General Aviation)	60-120
Transport (Reliever)	80-150
Passenger Transport (Commercial)	120-200
Passenger Transport (Primary Commercial)	150-300

H. AIRPORT LAYOUT PLANS

This section provides guidance in the preparation of the drawings that make up the Airport Layout Plan (ALP). The ALP graphically depicts existing airport facilities and proposed developments. The information shown on the ALP is determined from the planners' review of the aviation activity forecasts, facility requirements, and alternatives analysis. The process outlined in this chapter also applies to ALPs that are prepared without a master plan.

The ALP drawing set is made up of not only the ALP drawing but other supporting drawings that are considered to be appended to the ALP drawing. FDOT publications and drawing standards, as well as FAA Advisory Circulars and Orders, must be followed in producing the ALP drawing set. The ALP drawing set is a set of planning drawings and is not intended to provide design engineering accuracy. However, individual items such as runway coordinates, obstruction survey data, and application of airport design standards must comply with Federal survey standards. The ALP preparer will need to define accuracy requirements for specific elements of the ALP in cooperation with the airport and approving agencies. Five primary functions of the ALP define its purpose:

- An approved ALP is necessary for the airport to receive financial assistance.
- An ALP creates an approved concept for airport development by depicting proposed facility improvements.
- An ALP is a public document that serves as a record of aeronautical requirements, both present and future.
- An approved ALP enables the airport and the FAA to plan for facility improvements at the airport.
- The ALP can be a working tool for the airport sponsor, including its development and maintenance staff.

The FAA Southern Region states that:

> The ALP is a key 'communication' and 'agreement' document between the airport owner and the FAA. It represents an understanding between the airport owner and the FAA regarding the current and future development and operation of the airport.

1. Airport Layout Plan Drawing Set

The individual sheets that comprise the Airport Layout Plan drawing set will vary with each planning effort. The ALP preparer, airport sponsor, FAA, and FDOT must determine which sheets are necessary during the project scoping activities.

The individual sheets required by the FAA are defined in Appendix F of FAA Advisory Circular 150/5070-6, *Airport Master Plans*. FDOT also has specific ALP requirements that are detailed in Appendices B, D, and E of this document. Drawings that might be included in the Airport Layout Plan drawing set and as described in FAA AC 150/5070.6 are shown below. Those that are required by the FAA as minimum ALP drawings are identified as such:

- Cover Sheet – A separate sheet, with approval signature blocks, airport location maps, and other pertinent information as required by the Orlando FAA Airports District Office.
- Airport Layout Plan (Required) – A drawing depicting the existing and future airport facilities. The drawing should include required facility identifications, description labels, imaginary

surfaces, Runway Protection Zones, Runway Safety Areas, and basic airport and runway data tables.

- Existing Facilities – A optional sheet containing only the existing facilities in an ALP format
- Data Sheet – A separate sheet containing basic airport and runway data tables
- Facilities Layout Plan – A drawing that depicts existing and future facilities, and only critical, non-overlapping clearance criteria, with minimal text. It is essentially a simplified ALP.
- Terminal Area Plan(s) – This plan consists of one or more drawings that present a large-scale depiction of areas with significant terminal facility development. Such a drawing is typically an enlargement of a portion of the ALP. At a commercial service airport, the drawing would include the passenger terminal area including parking adjacent to the terminal, but might also include general aviation facilities and cargo facilities.
- Airport Airspace Drawing (Required) – 14 CFR Part 77, *Objects Affecting Navigable Airspace*, defines this as a drawing depicting obstacle identification surfaces for the full extent of all airport development. It should also depict airspace obstructions for the portions of the surfaces excluded from the Inner Portion of the Approach Surface Drawing.
- Inner Portion of the Approach Surface Drawing (Required) – Drawings containing the plan and profile view of the inner portion of the approach surface to the runway and a tabular listing of all surface penetrations. The drawing will depict the obstacle identification approach surfaces contained in 14 CFR Part 77, *Objects Affecting Navigable Airspace*. The drawing may also depict other approach surfaces, including the threshold-siting surface, those surfaces associated with United States Standards for Terminal Instrument Procedures (TERPS), or those required by the local FAA office or state agency. The extent of the approach surface and the number of airspace obstructions shown may restrict each sheet to only one runway end or approach.
- On-Airport Land-Use Drawing – A drawing depicting the existing and future land uses within an area immediately adjacent to the airport property boundary.
- Off-Airport Land-Use Drawing – A drawing depicting land uses and zoning in the area around the airport. At a minimum, the drawing must contain land within the 65 DNL noise contour. For general aviation airports or low activity commercial service airports, where noise issues are less important, on-airport land use and off-airport land use drawings may be combined.
- Airport Property Map – A drawing depicting the airport property boundary, the various tracts of land that were acquired to develop the airport, and the method of acquisition. This drawing is only required for those airports that have acquired land with Federal funds or through an FAA-administered land transfer program; however, it may be useful to all airport sponsors. If any obligations were incurred because of obtaining property or an interest therein, they should be noted. Obligations that stem from Federal grant or an FAA-administered land transfer program, such as surplus property programs, should also be noted. The drawing should also depict easements beyond the airport boundary. An airport property map is not a substitute for an Exhibit A unless it is prepared in accordance with FAA AC 150/5100-17, *Land Acquisition and Relocation Assistance for Airport Improvement Program Assisted Projects*.
- Utility Drawing – This drawing depicts the location and capacity of major utilities on the airport and in the surrounding area.
- Airport Access Plans – If access to the airport is a significant issue, a separate airport access drawing should be created, depicting the major routes of various modes of transportation that serve the airport. Such a drawing could also include proposed improvements to the system.

- Other Plan(s) – Drawings that address a specific, unique need at the airport. The sponsor, FAA and other approving agencies must discuss and agree to include them.

A narrative report is also considered one of the components of an ALP drawing set. However, it is generally not required when the submission of the ALP drawing set is accompanied by a master plan. The narrative report should include the aviation activity forecasts, the Airport Reference Code(s), supporting documentation for modifications of standards, runways, runway safety area determinations, proposed development, etc.

When an ALP drawing set is produced as a part of a master plan, a separate chapter within the master plan is devoted to the ALP set. A description of each of the drawings included in the set should be included in this chapter, along with a reduced copy of each drawing. Also included should be a description of the proposed airport development described within the ALP drawing set, deviations from standards, and the supporting documentation for the modifications, proposed development, etc.

2. Computer-Aided Drafting and Design Standards

ALP drawings may be produced electronically using Computer-Aided Drafting and Design (CADD) software. The airport, FDOT, and/or the FAA will select what program to use. Design standards should be established during the scoping of the project and may include defined line types, line weight/thickness, lettering styles, symbols, and file-naming conventions. The sponsor, FAA, and/or FDOT must determine which standards will be followed in development of the Airport Layout Plan drawing set.

Following specified CADD standards will facilitate the review and approval of the drawings by the FAA and FDOT, reduce the chance of someone misunderstanding the drawings, produce drawings that are useful for the agencies and the airport sponsor, and produce drawings that may be used in subsequent planning and design efforts.

3. Geographic Information System Applications

A Geographic Information System (GIS) is computer-based software that links geographic features on a map with various databases. Airport sponsors have found many uses for GIS, including inventory and database management for airport property, asset management, inventory and maintenance of airport facilities, preparation of emergency services, and inventory of sensitive environmental areas.

Currently, an ALP is typically created in CADD. However, the ALP may be linked to an existing or new GIS map incorporating the ALP. ALP standards and requirements as identified by the FAA-Southern Region and FDOT should be understood by the preparer as well as the intended use of GIS in creating or linking the ALP. ALP standards typically will include specific CADD standards for GIS compatibility. GIS applications will require specific facility and data requirements for inclusion into the ALP. National standards are being developed for e-ALP (GIS) based ALPs.

4. Base Mapping and Data Sources

When scoping a master plan, base mapping and acceptable data sources should be discussed and a consensus reached. These issues may affect many parts of the master plan, including the ALP, environmental matters, and facility requirements. Other issues to discuss concerning base mapping and data sources include:

- The FAA, FDOT, the airport sponsor and the ALP preparer will need to come to a consensus on the level of detail required for the base mapping.

- While some sponsors may already have the necessary data, new base mapping will often be required. One of the first steps in the planning process is to get the base mapping completed, since the information is used in the facility requirements determination and alternatives analysis and selection. The factors that will establish the area that will need to be mapped may include the following:

  a. Potential airport expansion beyond the existing boundaries
  b. Noise contours
  c. Potential environmental impact areas
  d. Ground access issues
  e. The area to be depicted on the Approach Surface Drawing
  f. GIS implications

Topography, intervals of topographical contours to use on the maps, budget, and potential future uses of the base mapping will all be factors in determining the intervals of the topographical contours. If aerial photogrammetry is used for the analysis of airspace obstructions, it can be paired with the base mapping, as long as the parameters for both products are established during scoping.

The ALP preparer, FDOT, and the FAA must establish data sources and parameters for the assessment of airspace obstructions near the airport prior to the development of the Approach and Departure Surfaces and the Airspace drawings. Existing obstruction clearing and maintenance programs at the airport may minimize the need for extensive obstruction surveying. Additional obstruction data sources may include airport obstruction removal programs, previous obstruction survey data, the airport's Obstruction Chart, and the FAA Digital Obstacle File. Surveys should be done in accordance with FAA Advisory Circulars 150/5300-16, 17, and 18.

The airport property map will identify the parcels that were acquired to develop the airport. An inventory of parcels immediately surrounding the airport boundary can be beneficial, particularly in areas of anticipated airport development.

5. Overview of Checklists

The *FAA Southern Region ALP Checklist*, which can be found in Appendix D, *Checklists,* is an essential tool in developing the Airport Layout Plan. The FAA Orlando ADO does not currently have a separate ALP checklist. However, the ALP preparer should contact both the Orlando ADO and FDOT prior to beginning an ALP to identify applicable ALP checklists, as well as other project checklists at the outset of each project. Checklists are continually revised to reflect changing Federal and state standards. The ALP preparer should also consult with the Orlando ADO and FDOT to determine the specific items on the checklists that are applicable to the project, as not all items on a checklist may be applicable to a specific project.

6. Approvals

Depending on the current requirements of the Orlando ADO, the FAA Southern Region, and of FDOT, the ALP drawing set approval process will vary. The airport sponsor, FAA, FDOT, and the ALP preparer must identify the appropriate approval process at the outset of ALP preparation.

The review of the Airport Layout Plan drawing set will typically be completed through multiple submittals. Milestones must be determined by the FAA and FDOT, but typically include:

- Preliminary ALP submittal – The ALP preparer should submit the ALP drawing set to the airport for review and comment to ensure that the graphic depictions correctly present the airport's goals.

- Draft ALP submittal – After any comments from the airport have been addressed, the ALP drawing set should be submitted to the FAA and FDOT for review and comment. Supporting documentation should include the Southern Region ALP Checklist and must be predetermined with the Orlando ADO. Review comments may be addressed prior to submittal of the Draft ALP drawing set for airspace review.
- Draft ALP Airspace submittal – The ALP preparer should submit the Draft ALP drawing set to the Orlando ADO. The Orlando ADO will distribute the Draft ALP to the various FAA offices for airspace review.
- Final ALP submittal – Based on the airspace determination, the ALP drawing set should be revised, as needed. The final ALP drawing set and accompanying narrative (Master Plan Report or ALP Narrative Report) should be sent to the Orlando ADO for distribution. A separate copy should be given to the FDOT.

The FAA may approve the Airport Layout Plan drawing set conditionally, based on specific projects or components that will be subject to further review and approvals prior to funding and implementation. These conditions typically are the environmental approvals needed for each project. The FAA may also unconditionally approve the ALP drawing set when all proposed development projects are either categorically excluded from additional environmental processing, have received a Finding of No Significant Impact (FONSI) resulting from an Environmental Assessment (EA), or have received a Record of Decision (ROD) resulting from an Environmental Impact Statement (EIS).

7. Airport Layout Plan Deliverables and Labor Estimates

Deliverables resulting from this effort include a reproducible drawing set, narrative report and an electronic copy of the drawing files. Table II-25 shows an estimate the amount of work normally required to complete the airport layout drawings set and narrative report.

Table II-25
TYPICAL HOURS TO DEVELOP AN AIRPORT LAYOUT PLAN SET

Airport Role	Hours to Develop the ALP Drawing Set and Narrative Report
Basic Utility	50-150
General Utility	80-250
Transport (General Aviation)	200-300
Transport (Reliever)	200-500
Passenger Transport (Commercial)	300-1,200
Passenger Transport (Commercial Primary)	500-1,500

I. FACILITIES IMPLEMENTATION PLAN

The facilities implementation plan is guidance on how to implement the findings and recommendations of the master plan. The complexity of each airport's implementation plan will vary, depending on the number and complexity of the projects and the airport sponsor's preferences. Simple facilities implementation plans may only call for the following:

- A schedule
- Listing of key projects
- Project descriptions
- Timing of key activities
- Estimated development costs
- Interrelated projects
- Any special considerations

A more detailed facilities implementation plan may also include:

- A comprehensive master schedule for the implementation of the major projects
- A detailed coordination plan with key activities and persons responsible
- Detailed project descriptions for each major project

The facilities implementation plan must address all of the airport's planned capital projects (even those projects that are not associated with the recommendations of the master plan) to ensure that adequate funding, personnel, and other resources are available. The facilities implementation plan must be clearly written to ensure that everyone on the airport staff, the FAA, and FDOT understand the schedule, potential funding, and responsible parties for each Capital Improvement Program (CIP) project.

It is expected that the facilities implementation plan will probably change from year to year in response to changing conditions. Therefore, it should be prepared so that it is easy to update. It should also be reviewed on an annual basis to determine if updates to the facilities implementation plan should be made.

1. Formulation of the Capital Improvement Program

The Capital Improvement Program is the key element of the facility implementation plan. The projects shown on the Airport Layout Plan (ALP) must be broken down into specific projects. These projects are incorporated into the sponsor's CIP. These CIP projects must be integrated into the airport's overall program of facility improvement projects, repair projects, and maintenance projects. All of the airport's projects must be coordinated with regard to schedule, scope, and sources and uses of funds in order to produce a realistic CIP. The airport's CIP must contain all projects including those that may not be reflected in the JACIP planning software.

Specific projects, as shown on the ALP, should be divided into smaller projects that reflect how projects are approved, designed, and constructed. Project descriptions may include the following types of information:

- Project identification (name and project number)
- Project scope (detailed project description and illustrations)
- Concise project purpose or objective (why the project is needed)
- Project schedule (begin/end dates for pre-design, design, construction, close out, and start-up)
- Prerequisites, dependent, and interrelated projects

- Project budget (construction cost estimate, including quantities and unit costs, soft costs, and contingencies)
- Environmental processing required
- Funding information (AIP grant and PFC estimates, other funding source),
- Special considerations (lease considerations, property acquisition requirements, known environmental mitigation requirements, and site constraints)
- Identification of responsibilities (key activities and when they must be completed, by agency, organization, position, or person)
- Benefit/cost information

Since an important objective of the capital improvement program is to determine when monies needed to improve airports will be required, schedules based on activity level thresholds are developed. These schedules have not proven entirely reliable in carrying out improvements due to unforeseen circumstances. Therefore, monitoring activity levels as thresholds is recommended.

It is also important that the CIP document informs all readers that while certain projects or portions of projects may be eligible for FAA and state funding, this is not a guarantee of funding. Many projects may not receive funding due to limited available funds and Federal and state funding priorities. An example of a capital improvement program is shown in Table II-26.

Table II-26
DEVELOPMENT SCHEDULE, COSTS, AND FUNDING SOURCES - TYPICAL FLORIDA AIRPORT

Project	Description and Year Planned	Quantity	Total Estimated Cost [1]	FAA Eligible	State Eligible	Sponsor Minimum	Private/ Other
Phase I							
I-1	AWOS (2011-2012)	1 Each	88,550	0	66,412	22,138	0
I-2	PAPI on Runway 2 and 20 (2013)	2 Each	25,000	0	18,750	6,250	0
I-3	RCP (2013)	1 Each	30,000	0	22,500	7,500	0
I-4	Land Acquisition for RPZ Control and Road Relocation (2013)	119 Acres	850,850	765,765	0	85,085	0
I-5	Relocation Sunshine Road (2013)	3,400 LF	326,680	294,012	16,334	16,334	0
I-6	Obstruction Removal (2013)	Lump Sum	15,000	13,500	750	750	0
I-7	ILS, HIRL, & MALSR [2] (2013)	1 Each	688,230	688,230	0	0	0
I-8	Security Fencing (2013)	16,450 LF	249,711	224,739	12,486	12,486	0
I-9	South Parallel Taxiway & Runway 32 Threshold Reconstruction ARP Relocation (2013)	8,890 SY	282,100	253,890	14,105	14,105	0
I-10	New Wall and Pump House (2013)	Lump Sum	5,000	0	0	5.000	0
I-11	T-Hangars (as needed)	7 Units	132,830	0	0	0	132,830
I-12	Taxilanes (as needed	Lump Sum	40,000	0	30,000	10,000	0
Phase I Totals			$2,240,136	$2,240,136	$181,337	$179,648	$132,830

[1] 15 Percent Engineering cost not included
[2] FAA mandated project to be funded under Facilities and Equipment

2. Project Sequencing and Master Schedule

The facilities implementation plan should consider the interrelationships among the projects in the sponsor's existing and revised JACIPs, particularly where airport projects might overlap or are complex. Planners should examine all projects to determine interrelationships and an implementation sequence to minimize potential conflicts, and establish a master schedule for the facility implementation plan.

The project sequencing plan or master schedule should reflect the airport sponsor's overall financial, environmental, and strategic plans. Aviation activity forecasts rarely predict the exact growth rate of any particular activity on an airport. For this reason, activity triggers for key improvements should be established to allow the airport to respond to actual activity levels as they occur. These triggers should allow enough time for planning, design, environmental, and construction activities to occur before a particular facility improvement is required. The project-sequencing plan should document these triggers along with the year in which planners expect them to be reached.

3. Key Activities and Responsibilities

The implementation plan should provide information regarding key activities and responsibilities. Because the lead-time associated with many projects is significant, the early identification of key activities and responsibilities can help ensure that essential preparatory activities are completed on a timely basis. As with other elements of the facility implementation plan, the level of detail regarding key activities and responsibilities will vary, depending on the sponsor's needs and the complexity of the program.

4. Capital Improvement Program Development Labor Estimates

Table II-27 estimates the amount of work normally required to complete the Capital Improvement Program (CIP).

Table II-27
TYPICAL HOURS TO COMPLETE CIP ELEMENT

Airport Role	Hours to Develop the CIP
Basic Utility	30-40
General Utility	35-45
Transport (General Aviation)	50-60
Transport (Reliever)	60-70
Passenger Transport (Commercial)	80-100
Passenger Transport (Commercial Primary)	100-120

J. FINANCIAL FEASIBILITY ANALYSIS

The airport sponsor must strategically plan the funding of the airport's Capital Improvement Program. The probability of Federal and state funding being available for each individual project should be carefully considered when developing the airport CIP. While individual projects may be eligible for Federal and state funding, this does not ensure that the funds will be available. Other airports within the region, state, and the national system are competing for funding. Both the FAA and FDOT have priority systems for ranking projects. It is prudent to consult with the airport's FAA and FDOT representatives to determine the overall priority of each project.

The airport will also be responsible for funding that portion of the cost of each project that is remaining once Federal and state funds have been assigned to a project. It is important that the airport sponsor identify the source of the local share of the project funding for each project in the CIP. Further, the airport sponsor has to demonstrate that it is able to fund the local share and to operate and maintain the project once it has been completed without impeding the ongoing operations of the airport. This is done through a financial feasibility analysis.

1. Basic Financial Analysis

The level of effort needed to conduct the feasibility analysis will vary greatly based largely on the size of the airport and the complexity of its financial structure. For small general aviation airports, it may be sufficient to identify the airport's revenues and expenses. When considering expenses, it is important to identify the local share of any capital improvements or equipment.

AIRPORT REVENUE

Sources of revenues at a typical general aviation airport could include:

- Fixed-Base Operator rentals
- Hangar rentals
- Fuel flowage fees
- Interest income
- Grants

AIRPORT EXPENSES

Typical expenses at a general aviation airport could include:

- Salaries
- Taxes/benefits
- Office expenses
- Insurance
- Legal/professional fees
- Custodial supplies
- Bad debts
- Contract services
- Utilities
- Operations and maintenance repair supplies
- Travel/conference expenses
- Promotion
- Capital equipment purchases (local share)
- Capital improvements (local share)
- Depreciation
- Landscaping

2. Supplemental Financial Analysis

For capital improvement programs requiring significant local airport funding, a review of historic revenues and expenses is advisable. Such items could include:

- Potential Historic Airport Revenues
  - Landing fees
  - Airline rentals
  - Concession fees and rentals
  - Vending and telephones income
  - Tenant utility, assessments and operating or maintenance fees
  - Contributions
  - Military facility rentals
  - Advertisements
  - Subsidies
  - Passenger Facility Charges (PFC)

- Potential Historic Expenses
  - Salaries and wages
  - Contracted services
  - Maintenance and renewal
  - Equipment maintenance contracts
  - New equipment
  - Automobile supplies, maintenance, and renewal
  - Telephone
  - Travel
  - Training
  - Supplies
  - Uniforms
  - Fuel
  - Utilities

3. Advanced Analysis For Major Projects

Given a major project (e.g., new air carrier terminal) and to obtain Federal or state funding and/or private funding, the analysis should consider a projection of revenues and expenses (*pro forma* cash flow analysis). Such pro forma may be prepared for each year of the CIP identifying the funding sources for the CIP and methods to enhance the airport's revenues. These projections can be on a general percentage increase basis or each element can be tied to selected separate forecasts such as:

- Forecasts of passenger enplanements
- Landing weights
- Terminal size

Normally, a financial consultant familiar with aviation would accomplish these projections. In turn, the financial consultant would generate the *pro forma* cash flow for the project(s).

4. Sources of Funding

FEDERAL FUNDING

Federal funding is provided through the Airport Improvement Program (AIP), which is derived

from the Federal Aviation Trust Fund. AIP-eligible projects include airport planning, airport development, and noise compatibility programs. Terminal development is also AIP eligible at all but large hub airports. The FAA Order 5100.38, *Airport Improvement Program Handbook* contains detailed information on the eligibility of projects for AIP funding.

Only public-use airports open to civil aviation are eligible for AIP funding. These airports are separated into categories based on the airport's activity. They are:

- **Commercial Service Airports*:*** airports that have at least 2,500 passenger enplanements each calendar year and receive scheduled passenger service.
  - **Primary Airports**: airports that have more than 10,000 annual passenger enplanements
    - Large Hub: airport with one percent or more of the total annual enplaned passengers of the entire U.S.
    - Medium Hub: airport with at least one quarter of one percent, but less than one percent of the total annual enplaned passengers of the entire U.S.
    - Small Hub: airport with at least 0.05 percent, but less than one quarter of one percent of the total annual enplaned passengers of the entire U.S.
  - **Non-hub Airport:** airports with at least 2,500 and no more than 10,000 annual enplaned passengers, also known as a non-primary commercial service airport
- **Reliever Airports:** airports designated by the FAA to relieve congestion at Commercial Service Airports and to provide improved general aviation access to the overall community
- **General Aviation Airports:** all remaining airports, including privately owned, public use airports that enplane 2,500 or more passengers annually and receive scheduled airline service
- **Cargo Service Airports:** airports that, in addition to any other air transportation services, are served by cargo-only aircraft with a total annual landed weight of more than 100 million pounds

The FAA uses two primary methods to distribute AIP grants to airports: Passenger Service Entitlement Grants and Discretionary Grants. The Passenger Service Entitlement Grants or "entitlement grants" are available only to primary commercial service airports and are an allocation of certain AIP funds based on an airport's total number of enplaned passengers in a given year. Pursuant to Vision 100, in any Federal fiscal year in which Congress appropriates funding for the AIP program at the $3.2 billion level or above, primary airports would receive apportionments based on the following number of enplaned passengers:

- $15.60 for each of the first 50,000 enplanements
- $10.40 for each of the next 50,000 enplanements
- $5.20 for each of the next 400,000 enplanements
- $1.30 for each of the next 500,000 enplanements
- $1.00 for each enplanement in excess of one million enplanements

Actual amounts of the AIP entitlement grants may be affected by the total amounts authorized and appropriated by Congress for the AIP. Entitlement grants may be carried over from one year to the next and may be used to pay eligible debt service on bonds issued to finance eligible projects.

Discretionary grants are based upon commitments to eligible development projects at the discretion of the FAA and are available for use by most types of public use airports. There are two types of discretionary funds: set-aside funds and remaining funds. The set-aside funds are

allocated for noise compatibility and military airports programs. The remaining discretionary funds are distributed to airports based on the National Priority System (NPS) for projects.

While originally designed to provide a source of reliable funding for commercial service airports that provide passenger service, changes to the AIP have also resulted in Cargo Service Entitlement Grants. Airports qualified as cargo service airports share the three and a half percent of the available AIP apportionment. Cargo funds are distributed to each cargo service airport in the same proportion as its proportion of landed weight of cargo aircraft to the total landed weight of cargo aircraft at all qualifying airports. To qualify for cargo service airport funding, cargo-only aircraft with a total annual landed weight of more than 100 million pounds must serve the airport. No cargo-service airport is allowed to receive more than eight percent of the total apportioned amount.

The FAA Letter of Intent (LOI) program helps fund large-scale capacity projects at primary or reliever airports. Within an LOI between the FAA and an airport sponsor, the FAA states that it intends to obligate AIP discretionary and entitlement funds from future budgetary authority in an amount that will not exceed the Federal portion of allowable costs for the specific project. The FAA issues an LOI to state that reimbursement will be made according to a given schedule as funds become available from Congress each year over the term of the LOI.

Part of the FAA grant application that airport sponsors submit when applying for project funds is a list of certain obligations (assurances). These assurances become part of the final grant offer or in restrictive covenants to property deeds. When airport owners or sponsors, planning agencies, or other organizations accept funds from FAA-administered airport financial assistance programs, they must agree to these obligations. These obligations require the recipients to maintain and operate their facilities safely and efficiently and in accordance with specified conditions. The duration of these obligations depends on the type of recipient, the useful life of the facility being developed, and other conditions stipulated in the assurances.

AIP eligible improvements are eligible for up to 95 percent federal funding with a minimum 5 percent local match. The largest commercial airports are eligible for up to 90 percent funding. Navigation aids, which are Federal facilities, are eligible for 100 percent Federal funding. Air carrier terminal public areas (non-revenue producing) are eligible for partial Federal funding based on the size of the airport and specific use restrictions. Specific rules for project funding should be vetted with FDOT and the FAA based upon current rules. Airline operation, airport management areas, gift shops, restaurants, auto parking, and all revenue-producing areas are generally excluded from Federal funding. The utilities for airport terminal buildings are funded on a ratio of public space versus non-public space standard. Selected equipment such as maintenance and fire-rescue vehicles is also eligible for Federal funding.

STATE FUNDING

Through FDOT, the State of Florida provides grant funds to publicly owned Florida airports that are open for public use and under public operation. Projects eligible for FDOT funding include all capital projects on airport property and those services directly related to capital projects, such as planning and design. The only capital projects “off airport” that are eligible are the purchase of mitigation land, noise mitigation, purchase of aviation easements, and access projects for intercontinental airports. FDOT provides one-half of the local portion or “share” of the cost of airport projects that include Federal funding. If Federal funding is not available, FDOT will provide up to one-half of the cost of a project for commercial service airports and up to 80 percent of the cost of the project for general aviation airports. For security projects, FDOT will provide up to 100 percent of the local share if Federal funding is provided. If Federal funding is not available, FDOT will provide up to 100 percent of the total security project costs. FDOT also provides interest-free 10-year loans for up to 75 percent of the cost to purchase airport land.

LOCAL FUNDING

The local share of a capital project is typically the cost that is left after the Federal and state funds, if any, have been determined. For those projects that are eligible for Federal funding, this can be as little as two and a half percent of a project. For those projects that are not eligible for Federal funding but which are eligible for state funding, this can be as much as 50 percent of the project costs. For those projects that do not meet the federal or the state funding requirements, the entire cost of the project will have to be borne by the airport.

In the case of financially self-sufficient airports with positive cash flows and accumulated cash reserves, a portion of the local share may be funded by such cash reserves and the remaining local share may be funded with a debt instrument. The resulting annual debt service would be paid from operating cash. However, there are a number of other available funding sources as well, including:

- **FAA-Approved Passenger Facility Charges:** Commercial service airports may impose a Passenger Facility Charge for each airport enplanement. PFC revenues may only be used for projects approved by the FAA. Currently, airport sponsors may impose a PFC at a level of up to $4.50 per enplaned passenger.
- **Contract Facility Charges:** Sometimes called a Customer Facility Charge, the Contract Facility Charge (CFC) is a charge commonly paid by rental car customers based on the number of contract days that a person has rented a vehicle. These are typically used for rental car facilities. They may include certain rental car facility operation and maintenance expenses. A CFC does not require FAA approval, but does require an agreement between the airport and the rental car companies operating at the airport.
- **Bonds:** The most commonly used financing instruments to fund major airport capital development programs are tax-exempt or tax-advantage municipal debt utilizing one of the following instruments.
    - **General Obligation Bonds:** General Obligation (GO) Bonds are a debt of the issuing agency and are supported by the agency's taxing power. They generally require voter approval, but usually have the lowest interest rates when compared to other municipal financing instruments.
    - **General Airport Revenue Bonds:** General Airport Revenue Bonds (GARBs) have no tax support but are secured by a pledge of either all revenues of the airport (gross revenue pledge) or, more commonly, net airport revenues.
    - **Special Facility Revenue Bonds**: Special Facility Bonds (SFBs) are issued by airport sponsors to encourage special developments. The facilities constructed with the proceeds are leased by the issuer to the user (typically one or more airlines) for a period that coincides with the term of the SFBs.
    - **Industrial Development Bonds:** Industrial Development Bonds are issued to fund the construction of an airport industrial park or other facilities that may attract business and increase non-aeronautical leasing revenues at an airport.
- **Third-Party Development:** Third-party development occurs when a third party or a tenant pays for the cost of the facilities directly or pledges to pay debt service on bonds to finance a construction project. The third party or tenant would lease the structure for a number of years, paying ground rent to the airport. At the end of the lease term, the ownership of the facility would normally revert to the airport.

5. Federal Priority System

NPIAS PRIORITY CALCULATION

Every two years, the FAA prepares for Congress the National Plan of Integrated Airport Systems (NPIAS), in which it identifies airports that are significant to national air transportation. The NPIAS also identifies the composition of the national system of airports, as well as airport development needs and the funds that will be necessary over the next ten years to expand and improve the national airport system. The Airport Capital Improvement Plan (ACIP) is the primary planning tool for systematically identifying, prioritizing, and assigning funds to critical airport development and associated capital needs for the National Airspace System (NAS). The ACIP also serves as the basis for the distribution of grant funds under the AIP. The National Priority System NPS is a part of the ACIP process. Specifics of the ACIP program and the National Priority System (NPS) are contained in FAA Order 5100.39, *Airports Capital Improvement Plan* and FAA Order 5100.38, *Airport Improvement Program Handbook* and are included in Appendix F of this document.

NATIONAL PRIORITY SYSTEM

The National Priority System is one of several models used by the FAA to prioritize airport development projects within the AIP. The NPS is the first evaluation factor and serves to categorize airport development in accordance with the FAA's goals and objectives. The model yields the highest percentage of projects funded under the AIP. In addition to the NPS, qualitative factors including state and local priorities, environmental issues, impact on safety and performance, airport growth, pavement condition index, and others are used.

The NPS model generates values between 1 and 100, with a higher number indicating a higher priority. This is detailed in more depth in Appendix F. Each fiscal year, an NPS threshold is established. All projects at or above the NPS threshold are considered consistent with FAA goals and objectives. Not all projects that are funded are above this threshold as other aspects of the AIP are taken into consideration. These lower value projects must meet all other funding criteria and be fully compliant with applicable requirements. These projects could include special emphasis programs that focus Federal funds on projects with lower NPS ratings, but address a national need.

AIRPORT CAPITAL IMPROVEMENT PLAN PROCESS AND SCHEDULE

1. No later than March 1 of the previous fiscal year - FAA Airports Financial Assistance Division (APP-500) submits ACIP guidance memorandum to regions.
2. By June 1 of the previous fiscal year - FAA Regional offices submit 3-year ACIP to the FAA Airports Program Implementation Branch (APP-520).
3. By July 1 of the previous fiscal year - APP-520 performs a national review of the regional ACIPs and coordinates corrections with regional offices.
4. No later than August 1 of the previous fiscal year - APP-520 performs national analysis to create national priority rating thresholds and the final candidate list is determined.
5. Between October 1 and October 15 - FAA regional offices submit proposals to add and/or delete projects to the final candidate list.
6. October 15, or 15 days after authorization/appropriation, whichever is later – FAA APP-520 prepares and submits regional budgets to FAA regional offices.
7. November 1, or 30 days after authorization/appropriation whichever is later – FAA regional offices develop recommended funding plans and submit to FAA APP-520.

8. December 1, or 60 days after authorization/appropriation, whichever is later – FAA regional offices develop recommended funding plans. The FAA Assistant Administrator of Airports (ARP-1) makes the selection/approval of projects for implementation of regional programming actions.
9. Unfunded candidate list projects will be considered as priority projects to receive any remaining converted "carryover" funding.
10. FAA Office of Airports Planning and Programming (APP-1) evaluates national performance and produces an annual performance report. The national performance may be captured by the AIP/PFC annual report and/or the biennial NPIAS report to Congress.

FINANCIAL FEASIBILITY

Both the FAA and FDOT require that the airport sponsor demonstrate within the master plan its ability to fund the proposed capital projects, particularly those within the near-term or about the first five years of the master plan CIP. Careful consideration must also be given to the reasonability of the amount of funds requested from each funding agency. When reviewing projects that identify funding in the near term, the FDOT will require that the airport sponsor conduct an analysis of the total FAA entitlement funds requested compared to entitlement funds historically received for that airport's projects. The airport may also calculate the type and amount of entitlement funds the airport will be eligible for in a given year to ensure that total entitlement funds are not "over programmed". Similarly, the FDOT will consider the National Priority value likely to be assigned to each project and the estimated threshold for each year of the CIP to evaluate the competitiveness of that project for discretionary grants before programming FDOT funds to the project. Because there is less certainty of the projects in the medium- and long-term, a more generalized discussion of the capability of funding these projects is acceptable.

If necessary, the financial feasibility discussion should include a CIP funding plan and a review of the airport's financial structure. A CIP funding plan should summarize the development-phasing plan and potential funding sources should be identified for each year of the financial plan, using realistic assumptions about how much funding will be available from all external sources.

The review of the airport's financial structure should analyze all aspects of the airport's operating structure that might affect the future cash flow at the airport. This could include the airport's management, relevant leases, outstanding debt, and airline use and lease agreements, where applicable. The airport's revenues and Operations and Maintenance (O&M) expenses by cost center should be examined for the prior three to five years to create an historical cash flow profile that may indicate the airport's financial operating trend. A *pro forma* cash flow analysis should be prepared that projects the airport's revenues, O&M expenses, existing and new debt service requirements, and any other revenue or expenses that might influence the cash flow. This should be done for each year of the CIP.

Where applicable, a sensitivity analysis may be done. The sensitivity would test to determine how sensitive the financial plan would be if particular assumptions varied. For instance, if PFC or revenue bonds were to be used to fund several projects, the sensitivity analysis would test how the financial plan would respond should enplanements not be as robust as forecast.

BENEFIT/COST ANALYSIS

Financial analysis considers only the cash benefits and costs accruing to the airport making the investment. A Benefit/Cost Analysis (BCA) requires the examination of all costs related to the construction and use of a project, whether the costs are borne by the airport, the FAA, FDOT,

the public, the airport user, or a third party. Similarly, all of the benefits resulting from the project regardless of who realizes the benefits must also be examined, recognizing that not all benefits and costs can be described in monetary or even in quantitative terms. The *FAA Airport Benefit-Cost Analysis Guidance,* issued in December 1999, details the methodology the FAA prefers in the development of BCAs.

Airport sponsors are encouraged by the FAA to conduct a BCA as part of the development of a master plan. However, a BCA is required only for projects that enhance the capacity of the airport and will receive $5 million or more in AIP discretionary funds or are named in a FAA Letter of Intent. BCAs require more detailed cost estimates than typically prepared for the master plan implementation plan.

6. Florida State Funding Program

All FDOT grants and loans are subject to the availability of funds appropriated by the Florida Legislature for each state fiscal year. The FDOT office aviation representative can assist the airport sponsor in developing a funding plan. Contact information for FDOT aviation representatives is listed in Section I of this guidebook.

FDOT PROJECT FUNDING CRITERIA

In order for an airport to be eligible for FDOT grant funds, it must have a local government airport sponsor, the airport sponsor must be legally in control of the operations and development of the airport and the airport must be open to the public. In order for a project to be eligible, the project must be consistent with the airport's role as defined within the Florida Aviation System Plan (FASP), identified in an FDOT-approved master plan and/or Airport Layout Plan, included in the Joint Automated Capital Improvement Plan (JACIP), and must be consistent with the Local Government Comprehensive Plan. The only exceptions are that security studies, equipment, and emergency security/preservation projects do not generally need to be included in a master plan.

FDOT PRIORITY SYSTEM

The guidelines for committing state aviation funds to eligible airport projects are set in the following order of priority:

1 Funds will be provided to support projects that are receiving or will soon receive funding from the FAA. The state's funding share shall be up to one-half of the non-Federal share. Commercial service airport projects are considered before general aviation airport projects.

2 Non-federally funded projects that are consistent with the FASP and that:

- Meet state standards for licensing as specified in Section 14-60.007, Florida Administrative Code (FAC), *Airfield Standards for Licensed Airports*
- Meet state and Federal standards for safety
- Meet state and Federal standards for security
- Preserve existing airport infrastructure
- Increase the capacity of Florida's airports

3 Economic development projects and projects that fund airport revenue enhancement projects according to FDOT Topic No. 725-040-060-d, *Airport Economic Development Program*

7. Economic Impact Analysis

It is sometimes desirable for general aviation and commercial service airports to conduct an economic impact analysis to illustrate the continuing benefits of an airport both to the community and to responsible government officials. The benefits can be expressed in dollars generated, as well as employment gained. Assistance can be obtained from FDOT for determining these impacts. An abbreviated procedure for estimating economic impacts can be found in Appendix C.

K. ENVIRONMENTAL APPROVAL REQUIREMENTS

Some airport development projects must undergo environmental review and approval before implementation can occur. The remaining projects must receive FAA concurrence that they are Categorical Exclusions (CATEX) and do not require environmental study. FAA Order 5050.4, *National Environmental Policy Act Implementing Instructions for Airport Actions*, reviews the requirements for an Environmental Assessments (EA) and Environmental Impact Statements (EIS). The state of Florida has also established similar environmental review requirements.

Since many project-specific factors influence the need for and depth of the environmental review, it is important that the airport work closely with the FDOT and the FAA to determine environmental processing requirements as projects are programmed into the JACIP. Such environmental study and approval requirements will require funding considerations within the JACIP and will affect the project timeline.

L. JACIP PROGRAMMING

Information developed in the Capital Improvement Program (CIP) will be used to provide input into the Joint Automated Capital Improvement Plan (JACIP). Airport improvement projects must be entered electronically (programmed) into the FAA Florida Capital Improvement Program and/or the FDOT Aviation Work Program in order for funds to be made available for grants. Projects should be programmed well in advance of the time when an airport will need the funds to begin the project. Ideally, airport managers will talk with FDOT and FAA ADO staff up to five years or more in advance of the need for money. Strategically, it is very important for airport managers to plan ahead as the collective statewide need for airport project funding grows and Federal appropriations decline.

To program capital improvement funds in both the FAA CIP and the FDOT Aviation Work Program, the FAA and the FDOT have developed a closely coordinated capital improvement planning process in partnership with Florida airports. This process is called JACIP. A basic understanding of the JACIP process is critical to the master planning process because it is one of the key steps in translating the "plan" into the "realities" of concrete, asphalt, buildings, NAVAIDs, and other airport facilities. The JACIP process is designed as an ongoing interactive process through which airports, the FAA, and FDOT can realistically strategize a plan of staged capital improvements for each airport, which effectively uses available funding sources to meet existing and future needs of the facility. The process consists of three steps:

- Once a year, or upon approval of an updated airport master plan, airport owners/sponsors are asked to update their capital improvement program through an on-line pre-application process available only to designated airport staff or their designated representatives on the Florida Aviation Database website at www.florida-aviation-database.com. The owner/sponsor should enter all projects from their airport CIP and indicate a breakout of funds requested from funding agencies. All projects from the most recently approved master plan or airport layout plan are to be listed, including those out to the planning horizon. The projects for future years (years 6 through 20) serve two purposes:
    - They document realistic information on funding needs for the future, which supports Federal and state efforts to plan and secure future airport improvement funds.
    - They provide a file of potential replacement projects within the program in the event that additional funds become available to Florida.
- The lists of projects that result from the automated pre-application process are immediately available on-line to the FDOT and the FAA ADO for review and evaluation. From the resulting database, the ADO identifies the projects that they are most likely to fund within anticipated Federal funding levels and program priorities, and marks those projects for entry into their System of Airport Reporting (SOAR). The SOAR is an enterprise application used by the FAA to evaluate the national priority of individual projects and to monitor their funding system.
- FDOT district offices use the JACIP as a foundation upon which to build the state aviation work program. The seven FDOT district office aviation work programs are then merged into a single database that includes input from the FAA CIP, balanced to accommodate anticipated Federal and state funding.

A required product of an airport master plan update is a current CIP for the 20-year airport master planning period, regardless of requested funding source, in a format that is conducive to entering project data into the JACIP. The airport owner/sponsor, FDOT, and FAA (if Federal funding is anticipated) must meet and discuss project funding sources and their availability when developing the JACIP during the airport master planning effort. Additionally, the updated

JACIP must not include any prior planned projects, not justified in the airport master plan or the airport layout plan.

Instructions and help files are available on the Florida Aviation Database website and should be referred to as necessary to complete the JACIP update. Specific questions should be addressed to FAA and FDOT representatives who deal regularly with the owner/sponsor. Normally, these will be the assigned planner from FAA's Orlando ADO and the FDOT aviation representative.

M. CONFORMANCE WITH FLORIDA STATUTES CHAPTER 330 AND FLORIDA ADMINISTRATIVE CODE RULE 14-60

All master plans submitted to FDOT must be in compliance with Florida Statutes Chapter 330, *Regulation of Aircraft, Pilots, and Airports* (FS Chapter 330) and the Florida Administrative Code Rule 14-60, *Airport Licensing, Registration, and Airspace Protection* (Rule 14-60). Both deal with the registration and licensing of public, private, and temporary airports in the State of Florida. Rule 14-60 also determines the minimum standards for Florida licensed airports. These standards include but are not limited to the following:

- All airports licensed by the state of Florida, whether public or private, must meet the FDOT minimum standards.
- Airports that hold an FAA Part 139 certificate are considered to be in compliance with the FDOT minimum standards.
- If an airport does not meet the minimum standards, but FDOT determines that an exception to the standards is warranted, they may issue a "special" license that states the conditions under which the license was granted.

The standards are further detailed in Appendix I, *Florida Statute Chapter 330 and Florida Administrative Code Rule 14-60*.

III. APPENDICES

A. GLOSSARY

TERMS

A

ACCELERATE-STOP DISTANCE AVAILABLE (ASDA) - The runway plus stopway length declared available and suitable for the acceleration and deceleration of an airplane aborting a takeoff (see Declared Distances).

AERONAUTICAL SURVEY PROGRAM (ASP) - The ASP, run by the NGS provides critical runway, obstruction, navigational aid, and airport feature information needed to fly safely into airports. The FAA uses the data to develop instrument approach and departure procedures, to determine maximum takeoff weights, to update aeronautical publications, and for airport planning and engineering studies.

AIR CARGO - Freight, mail, and express packages transported by air. This category may include perishable foods and livestock

AIR CARRIER - Aircraft operating under certificates of public convenience and necessity issued by the FAA, which authorizes scheduled air transportation over specified routes, a limited amount of non-scheduled air transportation over specified routes, and a limited amount of non-scheduled flights.

AIR NAVIGATIONAL FACILITY - Any facility used for guiding or controlling an aircraft's flight, landing, and takeoff.

AIR ROUTE SURVEILLANCE RADAR (ARSR) - Long-range radar that increases the capacity of air traffic control for handling heavy en route traffic. An ARSR site is usually some distance from the Air Route Traffic Control Center it serves. Its range is approximately 200 nautical miles. ARSR is also called ATC Center Radar.

AIR ROUTE TRAFFIC CONTROL CENTER (ARTCC) - A facility providing air traffic control service to aircraft operating on an IFR flight plan within controlled airspace and principally during the en route phase of flight.

AIR TAXI - Aircraft operated by a company or individual that provides transportation on a non-scheduled basis over unspecified routes usually with light aircraft

AIRCRAFT APPROACH CATEGORY - A grouping of aircraft based on a speed of 1.3 times the stall speed in the landing configuration at maximum gross landing weight. An aircraft shall fit in only one category. If it is necessary to maneuver at speeds in excess of the upper limit of a speed range for a category, the minimums for the next higher category should be used. For example, an aircraft that falls in Category A, but is circling to land at a speed in excess of 91 knots, should use the approach Category B minimums when circling to land. The categories are:

- Category A -Speed less than 91 knots
- Category B -Speed 91 knots or more but less than 121 knots
- Category C -Speed 121 knots or more but less than 141 knots
- Category D -Speed 141 knots or more but less than 166 knots
- Category E -Speed 166 knots or more

AIRCRAFT CLASSES - For the purposes of wake turbulence separation minima, ATC classifies aircraft as heavy, large, and small as follows:

- Heavy - Aircraft of 300,000 pounds or more maximum certificated takeoff weight

- Large - Aircraft of more than 12,500 pounds but less than 300,000 pounds maximum certificated takeoff weight
- Small - Aircraft of 12,500 pounds or less maximum certificated takeoff weight

AIRCRAFT TYPES - An arbitrary classification system that identifies and groups aircraft having similar operational characteristics for computing runway and terminal area capacity

AIRPLANE DESIGN GROUP (ADG) - A grouping of airplanes based on wingspan. The groups are as follows:

- Group I: Up to but not including 49 feet
- Group II: 49 feet up to but not including 79 feet
- Group III: 79 feet up to but not including 118 feet
- Group IV: 118 feet up to but not including 171 feet
- Group V: 171 feet up to but not including 214 feet
- Group VI: 214 feet up to but not including 262 feet

AIRPORT COOPERATIVE RESEARCH PROGRAM (ACRP) - An industry-driven, applied research program that develops near-term, practical solutions to problems faced by airport operators. ACRP is managed by the TRB and sponsored by the FAA. The research is conducted by contractors who are selected based on competitive proposals.

AIRPORT DESIGN SIMULATION (ADSIM) – FAA airport design computer simulation model

AIRPORT/FACILITY DIRECTORY (A/FD) - A seven-volume set plus Alaska and Pacific Territories of printed paper books containing data on public and joint-use airports, seaplane bases, heliports, VFR airport sketches, NAVAIDs, communications data, weather data sources, airspace, special notices, and operational procedures. The seven volumes cover the conterminous United States, Puerto Rico, and the Virgin Islands. Now available in digital format on the FAA website

AIRPORT LAYOUT PLAN (ALP) - Graphically illustrates the existing facilities of the Airport, as well as the proposed development based on the aviation forecasts, facility requirements, and the alternatives analysis

AIRPORT LAYOUT PLAN DRAWING SET - An ALP drawing set is made up of not only the ALP drawing but other supporting drawings that are considered to be appended to the ALP drawing. Depending on the specific requirements of the planning project, airport size, and activity level, some drawings may not be required or can be combined:

- Cover Sheet
- Airport Layout Plan Drawing (required)
- Terminal Area Plan
- Airport Airspace Drawing (required)
- Inner Portion of the Approach Surface Drawing (required)
- Airport Property Map
- Land Use Drawing
- Airport Access Drawing

AIRPORT IMPROVEMENT PROGRAM (AIP) - The AIP provides Federal funding from the Aviation Trust Fund for airport development, airport planning, noise compatibility planning, and similar programs. The AIP is implemented under various authorization acts that cover a specific period.

AIRPORT REFERENCE CODE (ARC) - A coding system used to relate airport design criteria to the operational and physical characteristics of airplanes anticipated to operate at the airport. As described in FAA AC 150/5300-13, the ARC is made up of two components. The first considers the aircraft approach category to be served as follows:

- Category A: aircraft with approach speeds of less than 91 knots
- Category B: Speeds of 91 knots or more but less than 121 knots
- Category C: speeds of 121 or more knots but less than 141 knots
- Category D: speeds of 141 or more knots but less than 166 knots
- Category E: speeds of 166 knots or more

The second component considers the airplane design group (ADG) to be served, which is based on wingspan and tail height as follows:

- Group I includes aircraft having a wingspan of up to but not including 49 feet and a tail height of less than 20 feet
- Group II includes aircraft having a wingspan of 49 feet or more up to but not including 79 feet and a tail height of 20 feet or more but less than 30 feet
- Group III includes aircraft having a wingspan of 79 feet or more up to but not including 118 feet and a tail height of 30 feet or more but less than 45 feet
- Group IV includes aircraft having a wingspan of 118 feet or more up to but not including 171 feet and a tail height of 45 feet or more but less than 60 feet
- Group V includes aircraft having a wingspan of 171 feet or more up to but not including 214 feet and a tail height of 60 feet or more but less than 66 feet
- Group VI includes aircraft having a wingspan of 214 feet or more up to but not including 262 feet and a tail height of 66 feet or more but less than 80 feet

AIRPORT ROLE - The capability of an airport defined in terms of the classes of aircraft that it can accommodate or, in the case of air carrier airports, the route length it serves non-stop in its market area. Role types in the state of Florida include (See specific role type for definition):

- Basic Utility Airport
- General Utility Airport
- Transport Airport
- Heliport
- Seaplane Base
- Short Haul
- Medium Haul; and,
- Long Haul

AIRPORT SERVICE LEVEL - Classification of an airport based on its functional role in the community. Service levels include (See specific service level type for definition):

- Commercial Service Airport
- General Aviation Airport
- Reliever Airport

AIRPORT SPONSOR - A public agency or tax-supported organization, such as an airport authority, that is authorized to own and operate the airport, to obtain property interests, to obtain funds, and to be able to meet all applicable requirements of current laws and regulations both legally and financially.

AIRPORT SURVEILLANCE RADAR (ASR) - Radar tracking aircraft by azimuth and range data without elevation data. It has a range of 50 miles. Also, called ATC Terminal Radar

AIRPORTS DISTRICT OFFICE (ADO) - Administrative regional office of FAA that oversees airport development projects.

AIRSPACE - The space above a certain area of land or water, used for flight, landings, and takeoffs

ALERT AREA - A category of special-use airspace of defined dimensions identified by an area from the surface of the earth to a specified altitude where DoD flight training occurs.

ANNUAL SERVICE VOLUME (ASV) - A reasonable estimate of the maximum number of annual aircraft operations that can theoretically be conducted at an airport, based on configuration, aircraft fleet mix, use, etc.

APPROACH LIGHT SYSTEM WITH FLASHING LIGHTS (ALSF) – A high-intensity approach lighting system with sequenced flashing lights that allows low-visibility operations. ALSF-I is suitable for Category I ILS operations, while ALSF-II is for Category II and Category II operations.

AVGAS - A high-octane aviation fuel used to power many aircraft that have piston or Wankel engines. A small number of piston engines are diesel engines or burn Jet-A fuel.

AVIGATION EASEMENT - The conveyance of a specified property interest in the airspace over real property, which grants rights and imposes restrictions. Rights include right-of-flight; right-of-entry to remove and/or mark obstructions; right to cause noise, vibration, fumes, dust, and fuel particles, etc. Restrictions include: penetration of FAR Part 77 surfaces by structures, growths, or obstructions; creation of electrical interferences with aircraft avionics, lighting that may confuse a pilot during approach, air emissions that may visually impair a pilot's vision, incompatible land uses, etc.

AZIMUTH (AZ) -The horizontal angle measured clockwise from north to an object. Also, see True Bearing.

B

BASED AIRCRAFT - An aircraft permanently stationed at an airport, usually by agreement between the aircraft owner and airport management.

BASIC UTILITY AIRPORT - Airports that can accommodate 95 percent of the general aviation propeller-drive fleet of aircraft under 12,500 pounds maximum gross weight.

BENEFIT/COST ANALYSIS (BCA) – An examination of all costs related to the construction and use of a project as well as all benefits regardless of who pays the costs and who benefits.

C

CAPACITY - The number of takeoffs and landings that can be safely handled with an acceptable level of delay. Airfield capacity represents the maximum number of operations (landings and takeoffs) that can be performed hourly or annually at an airport.

CATEGORICAL EXCLUSION (CATEX) - Actions that do not individually or cumulatively have a significant environmental effect and are excluded from the requirement to prepare an EIS or an EA

CATEGORY I INSTRUMENT LANDING SYSTEM (**CAT I**) - Precision Approach Category I. An instrument approach procedure that provides for approaches to a decision height of not less than 200 feet (60m) with visibility of not less than 1/2 mile (800m) or a runway visual range 2,400' (or 1,800' with operative touchdown zone and runway centerline lights).

CATEGORY II INSTRUMENT LANDING SYSTEM (CAT II) - An instrument approach procedure that provides for approaches to minima less than CAT I to as low as a decision height of not less than 100 feet (30m) and runway visual range of not less than 1,200 feet.

CATEGORY III INSTRUMENT LANDING SYSTEM (CAT III) - An instrument approach procedure, which provides for approaches to minima less than CAT II.

CIRCLING APPROACH - A descent in an approved procedure to an airport; a circle-to-land maneuver.

CIVIL AERONAUTICS BOARD (CAB) - Former Federal agency responsible for overseeing and regulating the air carrier industry; the FAA now carries out these tasks.

CLEARWAY (CWY) - A defined rectangular area beyond the end of a runway cleared or suitable for use in lieu of a runway to satisfy takeoff distance requirements

CLEAR ZONE - Formerly, the inner portion of the runway approach zone, now called the Runway Protection Zone (RPZ).

COMPUTER-AIDED DESIGN AND DRAFTING (CADD) - CAD is the use of computer technology for the design of real or virtual objects. CADD has additional drafting features.

COMMERCIAL SERVICE AIRPORT - An airport that handles scheduled passenger service by FAA-certified air carriers.

COMMUTER AIRLINE - Aircraft operated by an airline that performs scheduled flights over specified routes using light aircraft. Light aircraft have 30 seats or less and a maximum payload capacity of 7,500 pounds or less.

CONTINUING FLORIDA AVIATION SYSTEM PLANNING PROCESS (CFASPP) – A joint endeavor of the FAA and FDOT to continually monitor and maintain the Florida aviation environment and determine the aviation development requirements that best meet the projected aviation demand by continually updating the FASP.

CONTRACT FACILITY CHARGE/CUSTOMER FACILITY CHARGE (CFC) - Typically paid by airport rental car customers and used to finance rental car facilities, operations and maintenance.

CONTROL TOWER - A central operations facility in the terminal air traffic control system consisting of a tower cab structure (including an associated IFR room if radar-equipped) using air/ground communications and/or radar, visual signaling, and other devices to provide safe and expeditious movement of terminal air traffic.

CONTROLLED AIRSPACE - Airspace of defined dimensions within which air traffic control service is provided to IFR and VFR flights in accordance with the airspace classification

Note 1: Controlled airspace is a generic term that covers Class A, Class B, Class C, Class D, and Class E airspace.

Note 2: Controlled airspace is also that airspace within which all aircraft operators are subject to certain pilot qualifications, operating rules, and equipment requirements in Federal Aviation Regulations Part 91 (for specific operating requirements, please refer to Part 91). For IFR operations in any class of controlled airspace, a pilot must file an IFR flight plan and receive an appropriate ATC clearance. Each Class B, Class C, and Class D airspace area designated for an airport contains at least one primary airport around which the airspace is designated (for specific designations and descriptions of the airspace classes, please refer to Part 71). Controlled airspace in the United States is designated as follows:

- **Class A** - Generally, the airspace from 18,000 feet MSL up to and including Flight Level 600 (60,000 feet), including the airspace overlying the waters within 12 nautical miles of the coast of the 48 contiguous states and Alaska. Unless otherwise authorized, aircraft must be properly equipped and operated under IFR.
- **Class B** - Generally, the airspace from the surface to 10,000 feet MSL and surrounding the nation's busiest airports in terms of airport operations or passenger enplanements. There are currently 39 Class B airports in the United States, including three in Florida – Miami International Airport, Orlando International Airport and Tampa International Airport. The configuration of each Class B airspace is individually tailored and consists of a surface area and two or more layers (some Class B airspaces resemble upside-down wedding cakes), and is designed to contain all published instrument procedures once an aircraft enters the airspace. An ATC clearance is required for all aircraft to operate in the area, and all aircraft

that are so cleared receive separation services within the airspace. The cloud clearance requirement for VFR operations is "clear of clouds."

- **Class C** - Generally, the airspace from the surface to 4,000 feet above the airport elevation – also called above ground level (AGL) – and surrounding those airports that have an operational control tower, are serviced by a radar approach control, and have a certain number of IFR operations or passenger enplanements. Although the configuration of each Class C area is individually tailored, the airspace usually consists of a surface area(s) with a five nautical miles radius and an outer area. VFR aircraft are only separated from IFR aircraft within the airspace.
- **Class D** - Generally, the airspace from the surface to 2,500 feet AGL and surrounding those airports that have an operational control tower. The configuration of each Class D airspace is individually tailored, and when instrument procedures are published, the airspace is normally designed to contain the procedures. Arrival extensions for instrument approach procedures may be Class D or Class E airspace. Unless otherwise authorized, each person must establish two-way radio communications with the ATC facility providing air traffic services before entering the airspace. No separation services are provided to VFR aircraft.
- **Class E** - Generally, if the airspace is not Class A, Class B, Class C, or Class D, and it is controlled airspace, it is Class E airspace. Class E airspace extends upward from either the surface or a designated altitude to the overlying or adjacent controlled airspace. When designated as a surface area, the airspace will be configured to contain all instrument procedures. In addition, in this class are Federal airways, airspace beginning at either 700 or 1,200 feet AGL used to transition to and from the terminal or en route environment, en route domestic, and offshore airspace areas designated below 18,000 feet MSL. Unless designated at a lower altitude, Class E airspace begins at 14,500 MSL over the United States, including that airspace overlying the waters within 12 nautical miles off the coast of the 48 contiguous states and Alaska, and up to, but not including, 18,000 feet MSL, and the airspace above FL600.

D

DAY-NIGHT AVERAGE SOUND LEVEL (DNL) - The 24-hour average sound level, in decibels, for the period from midnight to midnight, obtained after the addition of ten decibels to sound levels for the periods between midnight and 7:00 a.m., and between 10:00 p.m. and midnight, local time. The symbol for DNL is Ldn.

DECISION HEIGHT (DH) - The height at which a pilot must decide during a precision approach either to continue the approach to a landing or to execute a missed approach

DECLARED DISTANCES - The distances the airport owner declares available and suitable for satisfying the airplane's takeoff run, takeoff distance, accelerate-stop distance, and landing distance requirements. The distances are: (see TORA, TODA, ASDA, and LDA).

DEPARTMENT OF COMMUNITY AFFAIRS (FLORIDA) (DCA) - The state's land planning and community development agency

DEPLANEMENTS - The total number of revenue passengers getting off aircraft, including destination, stopover, and transfer passengers in scheduled and nonscheduled services

DISCRETIONARY GRANTS – One of the types of grants issued by the FAA for projects that are funded by entitlements

DISPLACED THRESHOLD - The portion of pavement behind a displaced threshold may be available for takeoffs in both directions and rollout landings from the opposite direction.

DISTANCE MEASURING EQUIPMENT (DME) - A radio navigation aid installed with either a VOR or ILS to provide distance information from the facility to pilots by electronic signals. It measures, in nautical miles, the distance of an aircraft from the installation.

E

EN ROUTE - The route of flight from departure to destination, including intermediate stops (excludes local operations).

EN ROUTE AIRSPACE - Controlled airspace above and/or adjacent to terminal airspace

ENPLANEMENTS - The total number of revenue passengers boarding aircraft, including originating, stopover, and transfer passengers in scheduled and nonscheduled services.

ENPLANED PASSENGERS - See enplanements.

ENTITLEMENT GRANTS - Grants from the FAA AIP to commercial airports based on an airport's total annual enplanements or the cargo volume.

F

FEDERAL AVIATION REGULATION (FAR) - Commonly used term for the rules and regulations covering every aspect of aviation. Codified into Parts

FINAL APPROACH (IFR) - The flight path of an aircraft that is inbound on an approved final instrument approach course, beginning at the point of interception of that course and extending to the airport or the point where circling for landing or missed approach is executed

FINAL APPROACH (VFR) - A flight path of landing aircraft in the direction of landing along the extended runway centerline from the base leg to the runway

FINAL APPROACH FIX - The point from which final approach (IFR) to an airport is expected.

FIXED-BASE OPERATOR (FBO) - An airport-based business that parks, services, fuels and may repair aircraft; often rents aircraft and provides flight training. It often supplies services for private aircraft operators and their passengers, including rental cars, catering, meeting rooms and pilot lounges.

FLEET MIX - The proportion of aircraft types expected to operate at an airport.

FLIGHT SERVICE STATION (FSS) - A facility operated under contract to the FAA to provide flight assistance services such as aviation weather, filing flight plans, and disseminating Notices to Airmen

FLORIDA AVIATION ACTIVITY FORECAST - Forecast of aviation activity developed by FDOT for Florida airports including general aviation and non-hub airports.

FLORIDA AVIATION SYSTEM PLAN (FASP) - The aviation plan for Florida that provides documentation related to airports and related facilities needed to meet current and future statewide aviation demands

G

GENERAL AVIATION (GA) -Refers to all civil aircraft and operations that are not classified as air carrier

GENERAL AVIATION AIRPORT - All public airports except commercial service airports

GENERAL UTILITY (GU) AIRPORT - Airports that can accommodate all general aviation aircraft under 12,500 pounds maximum gross weight

GEOGRAPHIC INFORMATION SYSTEM (GIS) - Captures, stores, analyzes, manages, and presents data that is linked to location

GLIDE SLOPE (GS) - The vertical guidance component of an ILS

GLOBAL POSITIONING SYSTEM (GPS) - A satellite-based navigation system that allows users to fix their position with a high degree of accuracy anywhere on earth. The system allows navigation and instrument approaches without the assistance of ground-based radio navigation aids.

H

HELIPORT - A specialized airport for the exclusive operation and basing of rotorcraft

HIGH ALTITUDE AIRWAYS - Air routes above 18,000 feet MSL. These are also referred to as Jet Routes.

HOLDING - A maneuver that keeps an aircraft within a specified airspace while awaiting clearance to land. The holding pattern may be defined on charts or may under some circumstances be assigned by Air Traffic Controllers.

I

INSTRUMENT APPROACH - An aircraft approach conducted by reference to instruments, typically while the final approach fix is below VFR minimums but occasionally for other operational concerns

INSTRUMENT FLIGHT RULES (IFR) – Rules that govern flight procedures under limited visibility, in Class A airspace, or because of other operational constraints

INSTRUMENT LANDING SYSTEM (ILS) - A precision approach landing system consisting of a localizer (azimuth guidance), glide slope (vertical guidance), marker beacons, and approach light system

INSTRUMENT OPERATION - A landing or takeoff conducted while operating on an instrument flight plan

INTEGRATED NOISE MODEL (INM) -The primary FAA-sponsored noise model. This is a Windows-based model that produces noise contours and a variety of other noise data outputs pertinent to the development of airport noise impact assessments

INTERMODAL - Refers to the means of changing modes of transportation such as airplane to road or rail

ITINERANT OPERATION - All aircraft arrivals and departures other than local operations

J

JET A FUEL - The standard jet fuel type in the U.S. since the 1950s, only available in the U.S. A similar fuel distributed internationally is designated Jet A-1.

JET BLAST - Rapid air movement produced by the jet engines of aircraft, particularly on or before takeoff

JET ROUTES - See High Altitude Airways

JOINT AUTOMATED CAPITAL IMPROVEMENT PLAN (JACIP) - A coordinated process between the FDOT and the FAA to plan airport capital improvements and expenditures on a short- and long-term basis. The JACIP process has been designed as an ongoing and interactive process by which airports, the FAA and the FDOT can develop a realistic plan of staged capital improvements at each facility.

L

LANDING DIRECTION INDICATOR - A device that visually indicates the direction in which landings and takeoffs should be made

LANDING DISTANCE AVAILABLE (LDA) - The runway length declared available and suitable for landing (see Declared Distances)

LANDING MINIMUMS/IFR LANDING MINIMUMS - The minimum ceiling and runway visibility prescribed for landing while using an instrument approach procedure. Specific minima depend on the type of instrument approach and airport environment.

LETTER OF INTENT (FAA) (LOI) - Letter of intent from the FAA to fund a large-scale capacity project at a primary or reliever airport on a given schedule over a number of years

LOAD FACTOR - The percentage of occupied seats on an aircraft

LOCAL OPERATIONS - Operations performed by aircraft that:

a. Operate in the local traffic pattern or within sight of the tower

b. Are known to be departing for or arriving from flight in a local practice area located within a 20-mile radius of the control tower

c. Execute simulated instrument approaches or low passes at the airport

LOCALIZER (LOC) - Part of ILS that provides course guidance to the runway. Can stand as a separate approach when conditions do not allow a glide slope installation or the low landing minimum of an ILS

LOM - Compass locator (low-power radio beacon) at an outer marker (part of an ILS). Also, called COMLO

LONG HAUL AIRPORT - Commercial service airports that serve scheduled trips longer than 1,500 miles

LOW ALTITUDE AIRWAYS - Air routes below 18,000 feet MSL. These are also referred to as Victor Airways.

M

MARKER BEACON – A series of radio beacons used to advise a pilot on an instrument approach that a critical altitude should have been reached. The Outer Marker is typically 4 to 7 nm from the runway threshold and indicates where the pilot should intercept the published glide path. The Middle Marker is 3500 feet from the threshold and indicates where the aircraft should be at Decision Height. The Inner Marker is 1000 feet from the threshold and indicates Decision Height for a Category II ILS.

MASTER PLAN - Long-range plan of airport development requirements

MEDIUM HAUL AIRPORT - Commercial service airports that serve scheduled trips between 500 and 1,500 miles.

MICROWAVE LANDING SYSTEM (MLS) - An instrument landing system operating in the microwave spectrum, which provides lateral and vertical guidance to aircraft having compatible avionics equipment. This system has largely been made obsolete by GPS approaches.

MILITARY OPERATION - All arrivals and departures by aircraft that are not classified as civil (civilian)

MINIMUM DESCENT ALTITUDE (MDA) - The lowest altitude, expressed in feet above mean sea level, to which descent is authorized on final approach or during circling-to-land maneuvering during a non-precision instrument approach.

MISSED APPROACH - A prescribed procedure to be followed by aircraft that cannot complete an attempted landing at an airport while operating under IFR. In VFR flight, called a go-around

MIDDLE MARKER (MM) - Part of an ILS that defines a point along the glide slope normally at or near the point of decision height (DH)

MOVEMENT - Synonymous with the term operation, i.e., a takeoff or a landing

N

NATIONAL AIRSPACE SYSTEM (NAS) - The common system of air navigation and air traffic control communications facilities, air navigation facilities, airways, controlled airspace, special use airspace, and flight procedures authorized by Federal Aviation Regulations for domestic and international aviation

NATIONAL GEODETIC SURVEY (NGS) - Part of the National Oceanic and Atmospheric Administration (NOAA) that, in accordance with a series of interagency agreements with the FAA, provides airport geodetic control, runway, navigational aid, obstruction, and other aeronautical data that is critical to the operation of the National Airspace System.

NATIONAL SPATIAL REFERENCE SYSTEM (NSRS) - A consistent national coordinate system that specifies latitude, longitude, height, scale, gravity, and orientation throughout the U.S., as well as how these values change with time as defined by NGS

NOISE ABATEMENT - A set of procedures for the operation of aircraft at an airport that minimizes the impact of noise on the environs of the airport

NOISE COMPATIBILITY PROGRAM (NCP) - List of actions the airport proprietor proposes to undertake to minimize noise/land use incompatibilities.

NOISE EXPOSURE MAP (NEM) - Graphic depiction of both existing and future noise exposure resulting from aircraft operations and land uses in the airport environs.

NOISEMAP - FAA-approved computer model used to generate noise contours.

NON-DIRECTIONAL BEACON (NDB) - A ground station transmitting in all directions in the L/MF frequency spectrum; provides azimuth guidance to aircraft equipped with direction finder receivers. These facilities often have ILS outer markers to provide transition guidance to the ILS system.

NON-PRECISION APPROACH PROCEDURE/NON-PRECISION APPROACH - A standard instrument approach procedure in which no ground-based electronic glide slope is provided. Some GPS approaches provide vertical guidance, but approach minimums are higher than found with precision approaches.

NORTH AMERICAN DATUM (NAD) - A mathematical model of North America that allows the making of "flat" maps that represent curved surfaces.

NOTICE TO AIRMEN (NOTAM) - A notice essential to personnel concerned with flight operations containing information (not known sufficiently in advance to publicize by other means) concerning the establishment of, conditions of, or change in any component (facility, service, or procedure, or hazard in the National Airspace System).

O

OBJECT FREE AREA (OFA) - A two-dimensional ground area surrounding runways, taxiways, and taxilanes that is clear of objects except for those objects whose locations are fixed by function.

OBSTACLE FREE ZONE (OFZ) - The airspace defined by the runway OFZ and, as appropriate, the inner-approach OFZ and the inner-transitional OFZ, which is clear of object penetrations other than frangible NAVAIDs

OBSTRUCTION - Any object/obstacle exceeding the obstruction standards specified by FAR Part 77

OBSTRUCTION LIGHT - A light, usually red or white, frequently mounted on a surface structure or natural terrain to warn pilots of the presence of an obstruction

OPERATION - An aircraft arrival (landing) or departure (takeoff)

OUTER FIX - A point in the destination terminal area from which aircraft are cleared to the approach fix or final approach course

OUTER MARKER (OM) - A marker beacon, which is part of an ILS, located at or near the glide slope intercept altitude of an ILS approach

P

PASSENGER FACILITY CHARGE (PFC) – A charge imposed by commercial service airports on each enplanement for FAA-approved capital projects

PRECISION APPROACH - A standard approach in which an electronic glide slope is provided

PRIVATE AIRPORT - A privately owned airport closed to the public

PROHIBITED AREA - A category of special use airspace of defined dimensions identified by an area from the surface of the earth to a specified altitude where all flight activity is prohibited, e.g. the White House

PUBLIC INFORMATION WORKSHOP – An "open house" format public meeting used to provide and receive information between parties, typically used in airport master plans and environmental studies to transfer and solicit information between the study team and the public

PUBLIC USE AIRPORT - A publicly or privately owned airport open to the public without advance permission

R

RELIEVER AIRPORT - A specially designated general aviation airport that reduces congestion at busy commercial service airports by providing alternate landing areas for business aircraft

RELOCATED THRESHOLD - The portion of pavement behind a relocated threshold is not available for takeoff or landing. It may be available for taxiing aircraft

REMOTE COMMUNICATIONS OUTLET (RCO) - An unmanned communications facility remotely controlled by air traffic personnel. RCOs serve FSSs. RTRs (Remote Transmitter-Receivers) serve terminal ATC facilities. An RCO or RTR may be UHF or VHF and will extend the communication range of the air traffic facility. There are several classes of RCOs and RTRs. The class is determined by the number of transmitters or receivers. Classes A through G are used primarily for air/ground purposes. RCO and RTR class O facilities are non-protected outlets subject to undetected and prolonged outages.

RCOs and RTRs were established for the express purpose of providing ground-to-ground communications between air traffic control specialists and pilots at a satellite airport delivering en route clearances, issuing departure authorizations, and acknowledging instrument flight rules cancellations or departure/landing times. They may also be used for advisory purposes whenever the aircraft is below the coverage of the primary air/ground frequency.

RESTRICTED AREAS - A category of special use airspace of defined dimensions identified by an area from the surface of the earth to a specified altitude within which the flight of aircraft, while not wholly prohibited, is subject to restrictions

ROTATING BEACON - A visual NAVAID flashing white and/or colored light to indicate the location of an airport

RUNWAY PROTECTION ZONE (RPZ) - An area of the runway end (formerly the clear zone) used to enhance the protection of people and property on the ground

RUNWAY SAFETY AREA (RSA) - A surface surrounding the runway prepared or suitable for reducing the risk of damage to airplanes in the event of an undershoot, overshoot, or excursion from the runway

S

SEPARATION MINIMA - The minimum longitudinal, lateral, or vertical distances by which aircraft are spaced through the application of air traffic control procedures

SHORT HAUL AIRPORT - Commercial service airports that service scheduled trips for less than 500 miles

SIMPLIFIED DIRECTIONAL FACILITY (SDF) - A landing aid providing pattern direction

SMALL AIRCRAFT TRANSPORTATION SYSTEM (SATS) – A joint FAA-NASA initiative aimed at improving the ability of the traveling public to use small aircraft and general aviation airports instead of airlines or automobiles to travel from city to city. Florida institutions have helped lead the development of the program and the state has served as a technology test bed.

STOPWAY (SWY) - A rectangular surface beyond the end of a runway prepared or suitable for use in lieu of a runway to support an aborted takeoff, without causing structural damage to the airplane

STRAIGHT-IN APPROACH - A visual or instrument approach that involves minimum maneuvering by the aircraft to the runway threshold.

STRATEGIC INTERMODAL SYSTEM (SIS) - Florida Intermodal Transportation Plan involving airports and other modes of travel created to provide solutions for demand of travel to and from the state's growing regional and intercity economic centers

SUNSHINE LAWS - Laws that provide the public open access to governmental proceedings and decisions

SURFACE ACCESS - Ground transportation modes, such as auto or public transit, used to travel to and from the airport.

SYSTEM PLAN - A representation of the aviation facilities required to meet the immediate and future air transportation needs and to achieve the overall goals

T

TAKEOFF DISTANCE AVAILABLE (TODA) - The TORA plus the length of any remaining runway and/or clearway beyond the far end of the TORA (see Declared Distances)

TAKEOFF RUN AVAILABLE (TORA) - The runway length declared available and suitable for the ground run of an airplane taking off (see Declared Distances).

TERMINAL AIRSPACE - The controlled airspace normally associated with aircraft departure and arrival patterns to and from airports within a terminal system and between adjacent terminal systems in which tower en route air traffic control service is provided

TERMINAL RADAR SERVICE AREA (TRSA) - This area identifies the airspace surrounding a Class D airport wherein air traffic control provides radar vectoring, sequencing, and separation on a full-time basis for all IFR and participating VFR aircraft. Although pilot participation is

urged, it is not mandatory within the TRSA. TRSA airspace is not a controlled airspace classification from a regulatory standpoint.

T-HANGAR - A T-shaped aircraft hangar that provides shelter for a single airplane, typically built in rows back to back to allow the maximum number of private hangars within a given space.

THRESHOLD (TH) - The physical end of runway pavement (Also see Displaced Threshold and Relocated Threshold)

TOUCH-AND-GO OPERATION - An operation in which the aircraft lands and begins a takeoff roll without stopping. Typically used in a training scenario.

TRAFFIC PATTERN - The traffic flow that is prescribed for aircraft landing at, taxiing on, and taking off from an airport. The usual components of a traffic pattern are upwind leg, crosswind leg, downwind leg, and final approach. The traffic pattern will also have a prescribed altitude, which may vary depending on aircraft type.

TRANSIENT OPERATIONS - An operation performed at an airport by an aircraft that is based at another airport.

TRANSPORT AIRPORT - Airports that can accommodate high performance aircraft over 150,000 pounds maximum gross weight

TRANSPORTATION CONCURRENCY EXCEPTION AREAS (TECA) - Areas within Florida exempt from the DRI Process

TRUE BEARING (Azimuth) - The clockwise angle between a direction line and a meridian line that is referenced to the geographic north

U

UNCONTROLLED AIRSPACE - Airspace that has not been designated as Class A, B, C, D or E airspace, within which ATC has neither the authority nor the responsibility for exercising control over air traffic

UNICOM - Radio communications station that provides pilots with pertinent information (winds, weather, etc.) at specific airports. Often used as a common traffic advisory frequency at non-towered airports over which pilots report their position and intentions in order to coordinate operations with other pilots using that airport.

V

VECTOR - A heading issued to an aircraft to provide navigational guidance by radar

VERTIPORT – An identifiable ground or elevated area, including buildings and facilities, used to take off or land tilt rotor aircraft and rotorcraft.

VERTISTOP – A vertiport intended solely for the purpose of dropping off or picking up passengers or cargo

VFR AIRCRAFT - An aircraft conducting flight in accordance with Visual Flight Rules

VICTOR AIRWAYS - See Low Altitude Airways

VISUAL FLIGHT RULES (VFR) – Rules that govern flight procedures in good weather, unless the pilot chooses to operate under IFR or within Class A airspace.

W

WARNING AREA - A category of special use airspace of defined dimensions identified by an area from the surface of the earth to a specified altitude, which exists in international airspace along the U.S. coastal borders

WIND-CONE (WIND SOCK) - Conical wind direction indicator

WIND ROSE - A graphic documenting the wind persistency and wind coverage provided by the runway system

WIND TEE - A visual device used to advise pilots about wind direction at an airport

ACRONYMS

AAA - Airport Airspace Analysis
AAAE – American Association of Airport Executives
AC – Advisory Circular
ACC – Airport Consultants Council
ACI-NA – Airports Council International-North America
ACRP – Airport Cooperative Research Program
AD - Airport Design
ADA_1 – Americans with Disabilities Act
ADA_2 – Application of Development Approval
ADAP - Airport Development Aid Program
ADPM – Average Day/Peak Month
ADG - Airplane Design Group
ADO - Airports District Office (FAA)
ADSIM – Airport Design Simulation
AFSFO - Airway Facilities Sector Field Office
AFB - Air Force Base
A/FD - Airport/Facility Directory
AGL - Above Ground Level
AIA - Annual Instrument Approach
AIP - Airport Improvement Program
ALP – Airport layout Plan
ALS - Approach Lighting System
ALSF – Approach Light System with Flashing Lights
ANG - Air National Guard
AOPA – Aircraft Owners and Pilots Association
ARC – Airport Reference Code
ARFF - Aircraft Rescue and Fire Fighting
ARP - Airport Reference Point.
ARSR - Air Route Surveillance Radar
ARTS - Automated Radar Terminal Station.
ARTC - Air Route Traffic Control
ARTCC - Air Route Traffic Control Center
ASDA - Accelerate-Stop Distance Available
ASDE - Airport Surface Detection Equipment
ASNA - Aviation Safety and Noise Abatement Act of 1979
ASP - Aeronautical Survey Program
ASPH - Abbreviation for runway surface composed of asphalt.
ASR - Airport Surveillance Radar
ASV - Annual Service Volume
ATA - Air Transport Association
ATC - Air Traffic Control
ATCT - Air Traffic Control Tower
AVASI - Abbreviated Visual Approach Slope Indicator system
AWOS - Automated Weather Observing System
AZ - Azimuth
BCA - Benefit Cost Analysis
BRL - Building Restriction Line
CAB - Civil Aeronautics Board
CAC – Citizen's Advisory Committee

CADD - Computer-Aided Design and Drafting
CAF - Civil Air Facility
CAT I - Category I Instrument Landing System
CAT II - Category II Instrument Landing System
CAT III – Category III Instrument Landing System
CATEX - Categorical Exclusion
CBD - Central Business District
CFASPP – Continuing Florida Aviation System Planning Process
CFC – Contract Facility Charge/Customer Facility Charge
CFR - Code of Federal Regulation
CFW - Center Field Wind
CIP – Capital Improvement Program
CL - Centerline Lighting
CWY - Clearway
Db - Decibel
DbA - A-weighted Decibel
DCA – Florida Department of Community Affairs
DH – Decision Height
DNL – Day/Night Average Sound Level
DME – Distance Measuring Equipment
DoD - Department of Defense
DRI - Development of Regional Impact
DXF - AutoCAD Drawing Interchange file format
EA - Environmental Assessment
EDS - Environmental Data Service
EIS - Environmental Impact Statement
EL - Elevation
EPA - Environmental Protection Agency
FAA - Federal Aviation Administration
FAAF – Florida Aviation Activity Forecasts
FAC – Florida Administrative Code
FAR - Federal Aviation Regulation
FASP - Florida Aviation System Plan
FATO - Final Approach and Takeoff Areas
FBO - Fixed-Base Operator
FDOT - Florida Department of Transportation
FIS - Federal Inspection Services
FONSI - Finding of No Significant Impact
FSS - Flight Service Station
FS – Florida Statutes
FT - Flight Track
FTP - Florida Transportation Plan
FY - Fiscal Year
GA – General Aviation
GIS – Geographic Information System
GPS – Global Positioning System
GS – Glide Slope
GU – General Utility (Airport)
GVGI - Generic Visual Glide Slope Indicator
HIRL - High Intensity Runway Edge Lighting
HUD - Department of Housing and Urban Development (U.S.)

IFR - Instrument Flight Rules
IGES - Initial Graphics Exchange Specification file format
ILS - Instrument Landing System
IM - Inner Marker
IMC - Instrument Meteorological Conditions
INM - Integrated Noise Model
ISTEA - Intermodal Surface Transportation and Efficiency Act
JPA - Joint Participation Agreement
LDA - Landing Distance Available
LDIN - Lead-in Lights
Ldn - Symbol for Day-Night Average Sound Level
Leq - Equivalent Sound Level
LF - Lineal Feet
LGCP – Local Government Comprehensive Plan
LIRL - Low Intensity Runway Edge Lighting
LIRS - Low Impact Resistant Supports
LL - Low Lead
LOC - Localizer
LOI - Letter of Intent (FAA)
LOM - Compass locator at an outer marker (part of an ILS). Also, called COMLO
MALS - Medium (intensity) Approach Light System
MALSF - MALS with sequenced flashing lights
MALSR - MALS with runway alignment indicator lights (RAILs)
MDA – Minimum Decent Altitude
MGW - Maximum Gross Weight
MIRL - Medium Intensity Runway Edge Lighting
MITL - Medium Intensity Taxiway Edge Lighting
MLS – Microwave Landing System
MM - Middle Marker
MOA - Military Operations Area
MPH – Miles per Hour
MPO - Metropolitan Planning Organization
MSA - Metropolitan Statistical Area
MSL - Mean Sea Level
MSWLF – Municipal Solid Waste Land Fill
MTOW - Maximum Certificated Takeoff Weight
NAD - North American Datum
NAS_1 - National Airspace System
NAS_2 - Naval Air Station
NAVAID - See Air Navigational Facility
NCDC - National Climatic Data Center
NCP – Noise Compatibility Program
NDB - Non-Directional Beacon
NEM – Noise Exposure Map
NEPA - National Environmental Policy Act
NGS – National Geodetic Survey
NLR - Noise Level Reduction
NM - Nautical Mile
NOTAM - Notice to Airmen
NP - Non-Precision

NPDES - National Pollutant Discharge Elimination System
NPS - National Priority System
NPIAS - National Plan of Integrated Airport Systems
NSRS - National Spatial Reference System
NTIS – National Technical Information Service
NTP – Notice to Proceed
NWS - National Weather Service
O & D - Origination and Destination
OAG - Official Airline Guide
OC - Obstruction Chart
ODALS - Omni-Directional Approach Lighting System
OFA - Object Free Area
OFZ - Obstacle Free Zone
OM – Outer Marker
OPBA - Operations per based aircraft
P - Precision
PAPI - Precision Approach Path Indicator
PAR - Precision Approach Radar
PCI - Pavement Condition Index
PDA - Preliminary Development Agreement
PFC - Passenger Facility Charges
RAIL - Runway Alignment Indicator Lights
RAPCON - Radar Approach Control Center
RASP - Regional Airport System Plan
RCO - Remote Communications Outlet
RCP – Required Communications Performance
REIL -Runway End Identifier Lights
RFP - Request for Proposals
RFQ – Request for Qualifications
RNAV - Area Navigation
ROD – Record of Decision
ROFA - Runway Object Free Area
RPC - Regional Planning Council
RPZ - Runway Protection Zone
RSA - Runway Safety Area
RVR - Runway Visibility Range
RW and **R/W** - Runway
SAC - Study Advisory Committee
SALS - Short Approach Light System
SATS - Small Aircraft Transportation System
SDF - Simplified Directional Facility
SEL - Sound Exposure Level
SENEL - Single-Event Noise Exposure Level
SF - Square Feet
SIMMOD – FAA airfield capacity computer simulation model
SIS - Strategic Intermodal System
SOQ – Statement of Qualifications
SSALF - Simplified Short Approach Light System with Sequenced Flashing lights
(S)SALS - Simplified Short Approach Light System
STOL - Short Takeoff and Landing
SWPPP - Stormwater Pollution Prevention Plan

SWY - Stopway
SY – Square Yards
TAC – Technical Advisory Committee
TACAN - Tactical Air Navigation
TAF - FAA's Terminal Area Forecast
TAG - Tactical Airlift Group
TAP - Terminal Area Plan
TDZ - Touchdown Zone Lights
TH - Threshold
TERPS - Terminal Instrument Procedures
TL – Taxilane
TLOF – Touchdown and Lift-Off surfaces for rotorcraft and tilt rotor aircraft
TODA - Takeoff Distance Available
TORA - Takeoff Run Available
TRB – Transportation Research Board
TRSA - Terminal Radar Service Area
TSA_1 - Taxiway Safety Area
TSA_2 – Transportation Security Administration
TVOR - Terminal Very High Frequency Omni-Range Radio Station
TW and T/W - Taxiway
UHF - Ultra High Frequency
USGS - United States Geological Service
USWB - United States Weather Bureau
V - Visual Approach runway marking
V_1 - Takeoff Decision Speed
V_2 - Takeoff Safety Speed
V_{LOF} - Lift-off Speed
V_{SO} - Stalling Speed or the minimum steady flight speed in the landing configuration
VADI – Visual Approach Descent Indicator
VASI - Visual Approach Slope Indicator
VFR - Visual Flight Rules
VHF - Very High Frequency
VLJ – Very Light Jet
VOR - Very High Frequency Omni-Range
VORDME - VOR facility supplemented with Distance Measuring Equipment (DME)
VORTAC -VOR facility supplemented with Tactical Air Navigation (TACAN)
V/STOL - Vertical/Short Takeoff and Landing
VTOL - Vertical Takeoff and Landing (includes, but is not limited to, helicopters)
WMD - Water Management District

B. FAA AND FDOT PLANNING PROGRAMS

FAA Planning Program

The FAA provides guidance for the preparation of airport master plans through Advisory Circular 150/5070-6, *Airport Master Plans*, and the design of airports through Advisory Circular 150/5300-13, *Airport Design*. These circulars were developed in accordance with the Airport and Airway Development Act of 1970 and the subsequent Airport and Airway Improvement Act of 1982, as amended.

Advisory Circular 150/5070-6B defines an airport master plan as "a comprehensive study of an airport and usually describes the short-, medium-, and long-term development plans to meet future aviation demand." Additionally, it states, "the goal of an airport master plan is to provide the framework needed to guide future airport development that will cost-effectively satisfy aviation demand, while considering potential environmental and socioeconomic impacts."

Advisory Circular 150/5070-6 also states that the objectives of each master plan are to:

1. Document the issues that the proposed development will address.
2. Justify the proposed development through technical, economic, and environmental investigation of concepts and alternatives.
3. Provide an effective graphic presentation of the development of the airport and anticipated land uses near the airport.
4. Establish a realistic schedule for the implementation of the development proposed in the plan, particularly the short-term capital improvement program.
5. Propose an achievable financial plan to support the implementation plan.
6. Provide sufficient project definition and detail for subsequent environmental evaluations that may be required before the project is approved.
7. Present a plan that adequately addresses the issues and satisfies local, state, and Federal regulations.
8. Document policies and future aeronautical demand to support municipal or local deliberations on spending, debt, land use controls, and other policies necessary to preserve the integrity of the airport and its surroundings.
9. Set the stage and establish the framework for continuing planning process. Such a process should monitor key conditions and permit changes in plan recommendations as required

As part of its duties, the FAA develops and establishes standards, methods, and procedures relative to planning, designing, building, and operating public airport facilities throughout the United States. Accordingly, in Florida, the FAA provides master plan element approval, particularly the master plan forecasts and airport layout drawings, through its Orlando Airports District Office (ADO). The approval is necessary to ensure that the master plan complies with statutory and contractual requirements relative to airport operation and adheres to appropriate policies and procedures. Therefore, the FAA should be provided with copies of all interim and draft products.

Specifically, the forecasts and both draft and final versions of master plans and airport layout plans must be coordinated with the FAA. The FAA must review and approve the forecasts, review and comment on the draft Airport Layout Plan (ALP) documents, and accept or

conditionally accept the final ALP documents. To assist in preparation of the ALP, the FAA's "Southern Region Airport Layout Plan Checklist" (refer to Appendix D) should be completed and returned to the FAA with the draft ALP documents.

All comments from the FAA should be addressed and considered for inclusion in the production of the final ALP documents. FAA review and approval of the airport layout drawing are required by signature. FAA Southern Regional protocol states that the FAA review normally requires 60 to 90 days. This should be considered in the study schedule. However, specific review and approval requirements vary by project. The FAA program manager for each airport can provide the review and approval requirements on a case-by-case basis. Included in this Appendix are the FAA requirements and certifications relating to FAA processing of master plans and airport layout plans.

FAA Airport Improvement Program

To promote the development of a system of airports to meet the nation's needs, the Federal government began a grants-in-aid program for state and local governments shortly after World War II. This early program, the Federal-Aid Airport Program (FAAP), was authorized by the Federal Airport Act of 1946 and was funded from the general fund of the U.S. Treasury.

A more comprehensive program was established with the passage of the Airport and Airway Development Act of 1970. This act provided grants for airport planning under the Planning Grant Program (PGP) and for airport development under the Airport Development Aid Program (ADAP). These programs were funded from a newly established airport and airway trust fund into which revenues from several aviation user taxes on items such as airline fares, airfreight, and aviation fuel were deposited. The authority to issue grants under these two programs expired September 30, 1981. During this 11-year period, 8,809 grants totaling $4.5 billion were approved for airport planning and development.

The Airport Improvement Program (AIP), was established by the Airport and Airway Improvement Act of 1982 (Title V of the Tax Equity and Fiscal Responsibility Act of 1982, Public Law 97-248), and amended by the Airport and Airway Safety and Capacity Expansion Act of 1987, Public Law 100-223. The AIP provides funding for airport development, airport planning, noise compatibility planning, and noise compatibility programs as set forth in the Aviation Safety and Noise Abatement Act of 1979 (Public Law 96-193).

The 1987 act also established a new funding category based on air cargo activity and made a number of adjustments in other features of the original AIP. Projects eligible for funding were required to be at airports included in the National Plan of Integrated Airport Systems (NPIAS), which is prepared by the FAA and updated every two years.

The allocation of funds under the AIP is defined in the legislation such that these funds are distributed between apportioned and discretionary funds. The allocations by type and percentage vary based on type of project and airport. The amount allocated under AIP varies each year as appropriated by Congress and is not enough to meet the needs of all airports and projects; therefore, the FAA allocates funding based on a competitive prioritized process. The AIP is implemented under various authorization acts covering a specific timeframe.

FDOT Planning Program

The FDOT provides statewide guidance on the preparation of airport master plans with this guidebook, the Joint Automated Capital Improvement Plan (JACIP), and the Florida Aviation Activity Forecasts program. The FDOT administers these programs through its aviation office and through each FDOT geographic district.

The FDOT's role in reviewing and approving airport master plans consists of approval of master plan inputs into the JACIP program. All other technical approvals are made by the FAA. However, under the authority granted in Florida Statutes, Chapter 332, the FDOT has a prescribed airport master plan procedure. The procedure's purpose is:

> To prescribe Florida Department of Transportation (FDOT) participation in the review and processing of airport master plans prepared by local airport sponsors.

The FDOT procedure consists of five parts:

1. The airport master plan must be consistent with the guidelines for the airport described in the Florida Aviation System Plan (FASP).
2. The FDOT will participate in funding the master plan using joint participation agreements (JPA) if the project is in the FDOT district's five-year work program, in the JACIP, and subject to funding availability.
3. The FDOT may assist the airport in developing an appropriate scope of work in accordance with the FASP, the guidebook, and the JPA manual.
4. The FDOT will review and provide comments on the master plan narrative and ALP to be incorporated into the final plans. These comments will be in accordance with appropriate FAA Advisory Circulars and the FASP.
5. The airport will then use the master plan to develop the JACIP project requests, and the JACIP project requests will be used by the FDOT to develop its five-year work program.

C. ECONOMIC IMPACT ANALYSIS

As stated in Section II.J.7, an economic impact analysis can be a useful tool in the effort to illustrate the value of an airport to a regional area. The dominant and preferred methodology for conducting this impact analysis is the use of the Bureau of Economic Analysis (BEA) Regional Input-Output Modeling System Model (RIMS). This model uses 531 industrial sectors as defined in the BEA national input-output tables. The first use of the RIMS model to evaluate aviation impacts in Florida was by the FDOT in its 1983 Florida General Aviation Economic Assessment. Since then the popularity of the RIMS technique has grown exponentially.

The three basic parts in the RIMS model approach are:

- Direct Impacts
- Indirect Impacts
- Induced Impacts

Direct Impacts

Direct Impacts are those derived from airport employees or airport functions, including construction and maintenance. They are related to financial transactions that occur because of aviation services. These transactions normally occur at the study airport.

Examples of these impacts to the community include the following:

- Gasoline Sales
- Oil Sales
- Aircraft Parts Sales
- Aircraft Repair
- Payroll Expenditures
- Office Leases
- Hangar Construction
- Field Maintenance
- Capital Construction Projects
- Tiedown Fees
- Rental Aircraft Charges

Indirect Impacts

Indirect impacts normally occur off the airport by transient airport users. Examples include:

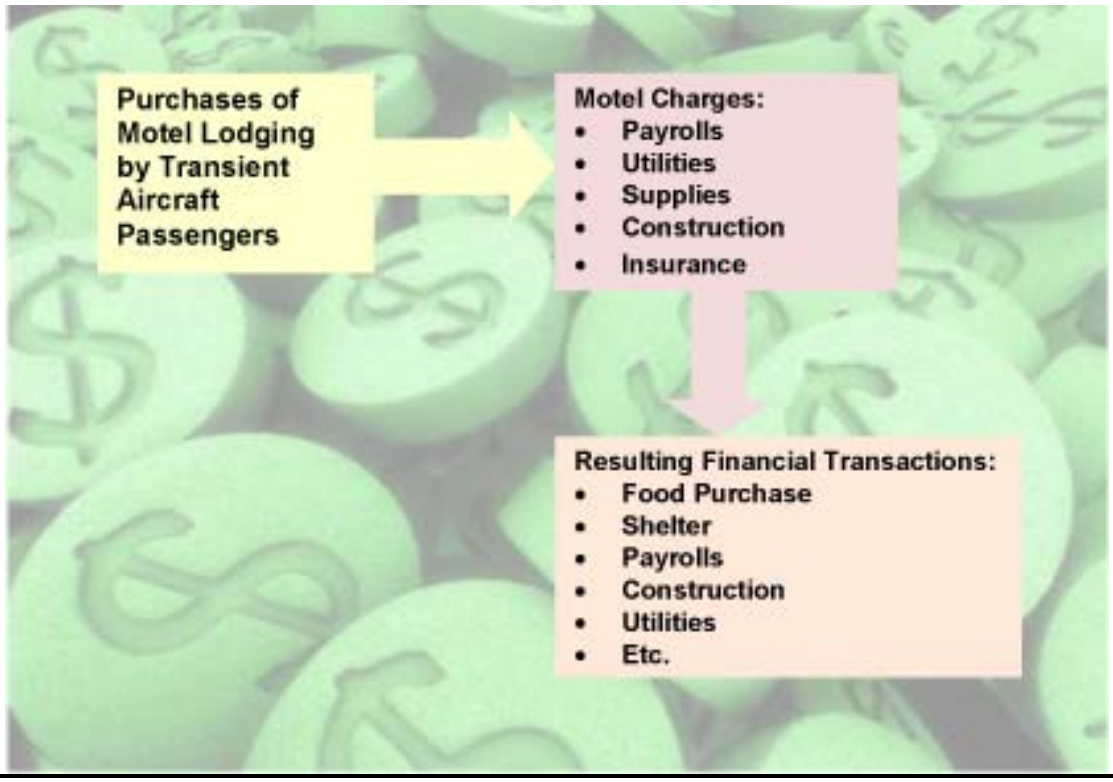
- Food
- Lodging
- Retail Purchases
- Ground Transportation

Only transient airport user expenditures are considered because they represent a long-term source of new money for the local economy.

Induced Impacts

Induced impacts are the “multiplier” or ripple effects associated with direct and indirect impacts. For example, motel charges will be responsible for other financial transactions in the local economy such as presented in Figure III-1.

Figure III-1
INDUCED IMPACTS



Model Development Procedure

To use the RIMS model techniques, several tasks need to be done, including:

- Deciding the geographic impact area to be analyzed
- Selecting industrial codes per airport activity sectors
- Surveying airport activity sectors for sales and expenditure data
- Applying RIMS multipliers

Persons familiar with both aviation activity and the BEA procedures should conduct the actual research and model applications.

Aircraft Owners and Pilots Association Impact Model Procedure[2]

In lieu of or before using the RIMS model procedure, a quick estimate can be made of airport economic impacts through use of the following Aircraft Owners and Pilots Association (AOPA) technique.

[2] Aircraft Owners and Pilots Association, Airports, A Valuable Community Resource, 1995 and online at www.aopa.org, Guide to Obtaining Community Support for Your Local Airport – What is Your Airport Worth.

DIRECT IMPACTS

As an example, assume that an airport support group has visited all employers and businesses at a general aviation airport (theirs has about 80,000 annual local operations). Using a questionnaire (a sample of which follows), the group determines that wages, fees, charges, taxes, operations and maintenance (O&M) costs, and capital improvements represents a total direct impact for the current year of $5.5 million.

INDIRECT IMPACTS

The group contacts the FAA airports office or airports division of the regional office and learns that the airport has 50,000 itinerant operations annually. Calculate the direct economic impact this way:

Divide the operations by two to determine annual itinerant arrivals. For this example:

50,000 ÷ 2 = 25,000

Multiply the arrivals by the average number of occupants per aircraft. The FAA estimates 2.5 occupants aboard each general aviation flight. Use 2.5, unless better local information is known.

25,000 x 2.5 = 65,500

Multiply the annual arriving passengers that figure by the average dollars spent in the local economy by itinerant passengers. Local chambers of commerce or tourism officials can provide the average dollars spent by each visitor. For this example, assume $100.

62,500 x $100 = $6,250,000 = Total Indirect Impact

INDUCED IMPACTS

Next, to determine induced impacts, multiply the sum of direct and indirect impacts by a multiplier of 3.

Induced Impact = 3 x (direct impact + indirect impact) =

3 x ($5,500,000 + $6,500,000) = 3 x $11,750,000 = $35,250,000

TOTAL ECONOMIC IMPACT

To determine total economic impact, add the direct, indirect, and induced impacts.

Direct (total from questionnaire)	$ 5,500,000
Indirect	6,250,000
Induced	35,250,000
Total Impact	$47,000,000

DIRECT ECONOMIC IMPACT QUESTIONNAIRE

We, _____, are conducting a survey to develop information concerning aviation's economic impact upon our community. We are asking all organizations directly involved with aviation and our airport to complete this questionnaire. The data you can furnish will enable us to tell a better story about the value of aviation. All information will be kept completely confidential, and only industry totals will be released.

We would like the data to be for (year) _____. If your data is for a different period, please indicate here_____.

How many employees do you have at the airport?
What is your annual payroll at the airport? $_____
You employ additional people away from the airport who support your airport operation?
If so, what is the annual cost of that support? $_____
How much did you pay to the airport last year for:

Operations/maintenance	$_____	
Landing fees	$_____	
Rentals	$_____	
Other fees/taxes	$_____	Subtotal $_____

How much did you spend in the area for the following:

Fuel, supplies, and equipment	$_____	
Advertising	$_____	
Local service (repair, janitorial, utilities, etc)	$_____	
Charitable contributions	$_____	
Capital expenditures	$_____	
TOTAL	$_____	Subtotal $_____
		Grand total $_____

Check the box that best describes the airport's relationship to your business:

O Essential O Very helpful O Helpful O No influence

Did you choose your present location because of the airport?

O Yes O No

D. CHECKLISTS

FDOT Project Formulation and Start-Up Checklist

- ☐ Review FDOT guidebook
- ☐ Meet with FDOT officials to discuss need and possible funding support.
- ☐ Obtain FAA and/or FDOT funding through the JACIP process.
- ☐ Coordinate with the FDOT to complete the consultant selection process in compliance with FAA and FDOT requirements.
- ☐ Issue request for proposals for professional aviation consulting services to conduct the airport master plan (as applicable).
- ☐ Short list top ranked firms.
- ☐ Schedule interviews of shortlisted firms or request a technical proposal (if necessary).
- ☐ Rank shortlisted firms in order of preference and begin negotiations with top ranked firms (if necessary).
- ☐ Work with the selected consultant to complete required applications for project approval and funding. The application should include a scope of work formulated in response to the guidebook, a project budget, and a schedule for the conduct and completion of the planning project.
- ☐ Coordinate approval of the application documents with FAA and FDOT officials.
- ☐ Issue notice-to-proceed to consultant.
- ☐ Conduct project start-up meeting.

End of FDOT Project Formulation and Start-up Checklist

FDOT Project Completion Checklist

- ☐ Review FDOT guidebook and project scope of work and budget.
- ☐ Is the inventory and data collection section complete with appropriate graphics?
- ☐ Does the forecast section address categories defined in the guidebook and scope of work?
- ☐ Does the demand/capacity and facility requirements section address the comprehensive need considerations defined in the guidebook and scope of work?
- ☐ When more than one potential location exists to develop needed airport facilities, does the alternative airport development concept section evaluate viable alternatives and make a logical and defendable recommendation?
- ☐ Does the environmental overview section address categories selected for analysis in the scope of work?
- ☐ Does the environmental overview section indicate additional environmental studies that might be required in the future and mitigation options?
- ☐ Does the report discuss both on-airport and adjoining airport land use plans, including height zoning requirements to support compatibility?
- ☐ Is a capital improvement program with anticipated development costs included in the report?
- ☐ Are project priorities considered?
- ☐ Does the financial analysis/financial plan meet the requirements of the scope of work?
- ☐ Do the capital improvements plans meet FDOT and/or FAA requirements?
- ☐ Does the included economic impact analysis meet the requirements of the scope of work?
- ☐ Does the report recognize user/public participation during the study?
- ☐ Does the report address the study goals and objectives and special issues as defined in the scope of work?
- ☐ As defined in the scope of work, have all meetings been held and all deliverables been received, including original hard copy and computer data of the plan report and drawings?
- ☐ Does the final product meet or exceed the requirements of the scope of work?

End of FDOT Project Completion Checklist

FDOT Inventory/Data Checklist

Historical and 20-year projection data reflecting:

- ☐ Population
- ☐ Employment Breakdown
- ☐ Retail Sales
- ☐ Income

State, county, and local road maps:

- ☐ Existing highway network
- ☐ Description of expected changes in ground transportation system and urban growth

Commercial Aviation Information (minimum 10-year history):

- ☐ Enplaned passengers by airline
- ☐ Cargo/mail (inbound and outbound)
- ☐ Operations by aircraft type
- ☐ Critical aircraft types

General Aviation information (minimum10-year history):

- ☐ Names and addresses of all based aircraft owners
- ☐ Based aircraft by type
- ☐ Operations by aircraft type
- ☐ Critical aircraft types

Operations (minimum 10-year history):

- ☐ Annual
- ☐ Monthly by day
- ☐ Peak-hour by type
- ☐ Instrument approaches and instrument operations
- ☐ Meteorological data

Aeronautical Charts:

- ☐ Low altitude en route charts
- ☐ SIDS, STARS, and Instrument Approach Procedures
- ☐ Runway Use Records
- ☐ Airport Operations Manual

FDOT Inventory/Data Checklist continued on next page

FDOT Inventory/Data Checklist continued from previous page

Air Traffic Control Tower:

- ☐ Standard Operating Procedures (SOP)
- ☐ Letters of Agreement (LOA)
- ☐ Orders
- ☐ Noise Complaint Records and Summary (5-year history)

Airport Tenant List:

- ☐ Contact and telephone (air carriers, FBOs, corporate, military, etc.)
- ☐ Lease agreements
- ☐ Type of business/services offered

Existing plans, if available, including, but not limited to:

- ☐ Airport Layout Plan (ALP)
- ☐ Airport environs map (1" = 2,000')
- ☐ Aerial photographs
- ☐ Land use maps
- ☐ Zoning maps and ordinances
- ☐ FAA Form 5010 (10 years)
- ☐ Previous pertinent reports and studies (Master Plan, Land Use Plan, State System Plan, Building Codes, etc.)
- ☐ Historical record of fuel flowage (annual gallons of AVGAS and Jet A)

Utility locations including:

- ☐ Telephone lines
- ☐ Water lines
- ☐ Sewer lines
- ☐ Electrical power lines
- ☐ Gas lines

FDOT Inventory/Data Checklist continued on next page

FDOT Inventory/Data Checklist continued from previous page

Financial Requirements:

- ☐ Annual budget (past five years)
- ☐ Bond debt schedule including the principal and interest
- ☐ Capital expenditures (past five years)
- ☐ Capital Improvement Program (CIP) (future five years) federal and state share
- ☐ State grant contribution (50% of local share)
- ☐ Federal and state funds by year (past five years)
- ☐ Consumer price index and wage index for the area (i.e., inflation factor)
- ☐ Landing, ramp, or hangar fees
- ☐ Separate terminal and airfield expenses and salaries
- ☐ Terminal space rentals excluding airlines
- ☐ Entitlement funds:
  - ☐ Where are they allocated?
  - ☐ How far into the future?
- ☐ Typical airline, concession, and FBO leases

Existing airport facilities and conditions:

- ☐ Runways and taxiways (including pavement strength)
- ☐ Lighting and NAVAIDs
- ☐ Terminal, administration, and other buildings
- ☐ Aircraft hangar and apron areas
- ☐ Fuel storage facilities
- ☐ Airport access roads and vehicular parking

End of FDOT Inventory /Data Checklist

U.S. Department of Transportation
Federal Aviation Administration
Southern Region – Airports Division
Effective Date: May 2004

Airport Layout Plan Drawing Set Checklist

Name of Airport: _____
Location of Airport: _____
Date of Review: _____ Reviewed by: _____

Significant Development Changes Since Previous ALP Approval/ or Narrative

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____

In order to protect the airspace for future conditions, complete the following information:

Future Airport Reference Point (ARP) **(if same as existing, provide existing ARP)**

ARP Latitude: _____, ARP Longitude:_____

Future Rwy End Coordinates & Rwy End Elevation **(if same as existing, provide existing coordinates)**

Rwy End: ____, Rwy End Latitude: _____, Rwy End Longitude: _____, Rwy End Elevation: _____
Rwy End: ____, Rwy End Latitude: _____, Rwy End Longitude: _____, Rwy End Elevation: _____
Rwy End: ____, Rwy End Latitude: _____, Rwy End Longitude: _____, Rwy End Elevation: _____
Rwy End: ____, Rwy End Latitude: _____, Rwy End Longitude: _____, Rwy End Elevation: _____

Existing and Proposed Modification of Standards (MOS)

Existing Deviation of Standard/ FAA Approved MOS FAA Approval Date (if any) Expiration Date (if any)

1. _____
2. _____
3. _____

Proposed Deviation of Standard/ FAA Modification of Standards

1. _____
2. _____
3. _____

Runway Safety Area Re-Evaluations

( ) Concur with Runway Safety Area Determination currently on file with FAA.

( ) Reevaluation of Runway Safety Area Determination completed as part of planning document and shown on this ALP set.

Narrative Report	Yes	No	Comments
Report Provided	( )	( )	_____
Aeronautical Forecasts			
- 0-5 yrs., 6-10 yrs., 10-20 yrs	( )	( )	_____
-Total annual operations	( )	( )	_____
- Annual itinerant operations	( )	( )	_____
- Based aircraft	( )	( )	_____
- Annual instrument approaches (if applicable)	( )	( )	_____
- Annual itinerant operations by critical aircraft	( )	( )	_____
- Annual itinerant ops by more demanding aircraft	( )	( )	_____
Proposed Development Justification	( )	( )	_____
Special Issues (MOS, etc.)	( )	( )	_____
Development Schedule and Graphics	( )	( )	_____
Proper Agency Coordination (sponsor, local, state)	( )	( )	_____
Airport Layout Drawing			
Proper Agency Approval (Sponsor, Local, State)	( )	( )	_____
Sheet Size - 24"x36"/ 22" x 34"	( )	( )	_____
Scale 1"=200'-600'	( )	( )	_____
2'-10' Labeled Contours	( )	( )	_____
North Arrow			
- True & magnetic	( )	( )	_____
- Declination w/ annual rate of change	( )	( )	_____
Wind Rose			
- Source & time period	( )	( )	_____
- MPH & knots	( )	( )	_____
- 12 MPH individual & combined coverage	( )	( )	_____
- 15 MPH individual & combined coverage	( )	( )	_____
Airport Reference Point (ARP)			
- Existing w/ Lat./ Long. (NAD 83)	( )	( )	_____
- Ultimate w/ Lat./ Long. (NAD 83)	( )	( )	_____
Elevations (Existing & Ultimate)			
- Existing runway ends	( )	( )	_____
- Displaced thresholds	( )	( )	_____
- Ultimate runway ends	( )	( )	_____
- Runway intersections	( )	( )	_____
- Runway high & low points	( )	( )	_____
- Touchdown zone elevation	( )	( )	_____
(highest Rwy elevation in first 3,000' of any Rwy having published straight -in minima)			
Drawing Lines			
- Existing property boundary	( )	( )	_____
- Ultimate property boundary	( )	( )	_____
- Building restriction line (both sides)	( )	( )	_____
- Existing development shown as solid	( )	( )	_____
- Future development shown as dashed/ shaded	( )	( )	_____

Airport Layout Drawing (Continued)	Yes	No	Comments
Runway Drawing Details (Existing & Ultimate)			
- Runway(s) Depiction	( )	( )	_____
- Length & width	( )	( )	_____
- End numbers	( )	( )	_____
- True bearing (nearest sec.)	( )	( )	_____
- Markings (basic, NPI, PIR)	( )	( )	_____
- Lighting (thresholds only)	( )	( )	_____
- Threshold lat/ long & elevations	( )	( )	_____
- Displaced threshold lat/ long & elevations	( )	( )	_____
- Runway safety areas & dimensions	( )	( )	_____
- Runway object free areas & dimensions	( )	( )	_____
- Runway obstacle free zones	( )	( )	_____
- Centerline w/ true bearing	( )	( )	_____
- Approach aids indicated (ILS, REILS, etc.)	( )	( )	_____
- Lat/ long & elevation for non-federal on-airport NAVAIDs (used for instrument approach procedure)	( )	( )	_____
Taxiway Details (Existing & Ultimate)			
- Taxiway widths	( )	( )	_____
- Designations	( )	( )	_____
- Separation dimensions to:			
Runway centerline(s)	( )	( )	_____
Parallel taxiway(s)	( )	( )	_____
Aircraft parking area(s)	( )	( )	_____
Aircraft Parking Aprons			
- Existing & ultimate aprons shown	( )	( )	_____
- Dimensions	( )	( )	_____
- Tie-down layout/ locations	( )	( )	_____
Runway Protection Zones (RPZs)			
- Existing & ultimate RPZs shown	( )	( )	_____
- Dimensions	( )	( )	_____
- Approach slope (20:1, 34:1, 50:1)	( )	( )	_____
Title & Revision Blocks			
- Name and location of airport	( )	( )	_____
- Name of preparer	( )	( )	_____
- Date of drawing	( )	( )	_____
- Drawing title	( )	( )	_____
- Revision block			
- FAA disclaimer	( )	( )	_____
- Sponsor approval block	( )	( )	_____
Airport Data Block (Existing & Ultimate)			
- Airport elevation (MSL)	( )	( )	_____
- Airport Reference Point (ARP) Data	( )	( )	_____
- Airport & terminal NAVAIDS (beacon, ILS)	( )	( )	_____
- Mean maximum temperature	( )	( )	_____
- Airport Reference Code (ARC) for each runway	( )	( )	_____
- Design Aircraft for each runway	( )	( )	_____
- Identify GPS at airport	( )	( )	_____

Airport Layout Drawing (Continued)

	Yes	No	Comments
Runway Data Block (Existing & Ultimate)			
- % effective gradient	( )	( )	_____
- % wind coverage (MPH & knots)	( )	( )	_____
- Maximum elevation above MSL	( )	( )	_____
- Runway length	( )	( )	_____
- Runway width	( )	( )	_____
- Runway surface type (turf, asphalt…)	( )	( )	_____
- Runway strength (SWG, DWG…)	( )	( )	_____
- Part 77 approach category (visual, NPI, PIR)	( )	( )	_____
- Type instrument approach (ILS, GPS…)	( )	( )	_____
- Approach slope (20:1, 34:1, 50:1)	( )	( )	_____
- Runway lighting (HIRL, MIRL, LIRL)	( )	( )	_____
- Runway marking (PIR, NPI, BCS)	( )	( )	_____
- NAVAIDS & visual aids	( )	( )	_____
- Runway safety area dimensions (standard & non-standard)	( )	( )	_____
Miscellaneous			
- Airport facility/ building list (existing & future)	( )	( )	_____
- Standard legend	( )	( )	_____
- Location map	( )	( )	_____
- Vicinity map	( )	( )	_____
- Roadways, traverse ways identified	( )	( )	_____

Additional Comments:

Airport Airspace Drawing

Ultimate Runway Length Plan View of Surfaces	( )	( )	_____
Profile View of Ultimate Runway Lengths	( )	( )	_____
Obstruction Data Tables	( )	( )	_____
Sheet Size Same as ALP	( )	( )	_____
Plan View Scale 1"=2000'	( )	( )	_____
Profile View Scale 1"=1000' Horizontal, 1"=100' Vertical	( )	( )	_____
Title & Revision Blocks	( )	( )	_____
Approach Plan View Details			
- USGS base map	( )	( )	_____
- Runway end numbers shown	( )	( )	_____
- Elevation contours of 50' on all slopes	( )	( )	_____
- Show most demanding surface lines as solid and others as dashed	( )	( )	_____
- Identify penetrating objects & top elevations (for those in inner approach add note, "Refer to the inner portion of the approach surface plan view details for close-in obstructions.")	( )	( )	_____
- Show PIR approach of 50,000 on separate sheet as necessary	( )	( )	_____
- Note any height restriction zoning/ ordinances/ statutes in place	( )	( )	_____
Approach Profile View Details			
- Ground profile along extended centerline (highest profile elevations of width & length of approach)	( )	( )	_____
- Identify significant objects (roads, rivers, etc.) w/ elevations	( )	( )	_____
- Existing & ultimate runway ends and approach slopes	( )	( )	_____

Additional Comments:

Inner Portion of the Approach Surface Drawing	Yes	No	Comments
Large-Scale Plan View for Each Runway End (up to 100' height above runway end)	( )	( )	_____
Large-Scale Profile View for Each Runway End (up to 100' height above runway end)	( )	( )	_____
Sheet Size	( )	( )	_____
Scale 1"=200' Horizontal, 1"=20' Vertical	( )	( )	_____
Title & Revision Blocks	( )	( )	_____
Separate Approach Tables with Obstruction Data			
- Type of approach (NPI, etc.)	( )	( )	_____
- Approach Slope (20:1, etc.)	( )	( )	_____
- Obstruction number	( )	( )	_____
- Obstruction description	( )	( )	_____
- Approach penetration (in feet)	( )	( )	_____
- Proposed mitigation (including "none.")	( )	( )	_____
Inner Approach Plan View Details			
- Aerial photo base map	( )	( )	_____
- Obstructions numbered	( )	( )	_____
- Property line depicted	( )	( )	_____
- Identify by numbers all traverse ways w/ elevations & vertical clearances in approach (At approach edge & extended centerline)	( )	( )	_____
- Depict existing & ultimate runway ends	( )	( )	_____
- Ground contours shown	( )	( )	_____
Inner Approach Profile View Details			
- Identify significant terrain/ items in RSA	( )	( )	_____
- Identify obstructions with numbers on plan view	( )	( )	_____
- Depict roads and railroads at edge of approach as dashed	( )	( )	_____

Additional Comments:

Terminal Area Drawing			
Large-Scale Plan View of Terminal/ GA Area(s) as Needed	( )	( )	_____
Show Existing & Future Buildings	( )	( )	_____
Sheet Size Same as ALP	( )	( )	_____
Scale 1"=50'-100'	( )	( )	_____
Title & Revision Bocks	( )	( )	_____
Legend	( )	( )	_____
Building Data Table (Existing & Ultimate)			
- Number facilities	( )	( )	_____
- Include top elevations	( )	( )	_____
- Identify obstruction marking	( )	( )	_____

Additional Comments:

Land Use Drawing (Existing & Ultimate)	Yes	No	Comments
- Basic airport features/ surfaces	( )	( )	_____
- Property lines	( )	( )	_____
- Include all land uses (industrial, residential, etc.) on & off airport (including non-aeronautical) to minimum 65 LDN	( )	( )	_____
- Line of sight or runway visibility zones shown	( )	( )	_____
- Note any existing land use ordinances/ statutes in place	( )	( )	_____
- Noise contours as required in scope of work (60, 65 & 70 LDN)	( )	( )	_____
- Sheet size same as ALP	( )	( )	_____
- Scale same as ALP	( )	( )	_____
- Title & revision block	( )	( )	_____
- Aerial base map	( )	( )	_____
- Legend (symbols and land use descriptions)	( )	( )	_____
- Identify recommended land use changes	( )	( )	_____
- Identify public facilities (schools, parks, etc.)	( )	( )	_____

Additional Comments:

Airport Property Map (Existing & Ultimate)			
Property Lines (Clear & Bold)	( )	( )	_____
RPZ's Shown	( )	( )	_____
Tracts of Land on and off Airport	( )	( )	_____
Sheet Size Same as ALP	( )	( )	_____
Scale Same as ALP	( )	( )	_____
Title & Revision Block	( )	( )	_____
Legend	( )	( )	_____
Airport Features (expansion, etc.)/ Critical Surfaces (RSA's, etc.) Shown (to aid in determining eligible land needs)	( )	( )	_____
Data Table			
- Numbering system for parcels	( )	( )	_____
- Date of acquisition	( )	( )	_____
- Federal aid project number	( )	( )	_____
- Type of ownership (fee, easement, federal surplus, etc.)	( )	( )	_____
- Parcel acreage	( )	( )	_____

Additional Comments:

E. STANDARD AIRPORT MASTER PLANNING DATABASE FORMATS

EXISTGAPR.DBF
Guidebook Table II-4 & II-5

Table III-1
EXISTING AIRCRAFT HANGAR AND APRON

Field	Field Name	Type	Width	Description
1	LOCID	Character	4	Four-letter airport designator
2	REFNO	Numeric	2	Reference number
3	HGSIZSF	Numeric	7	Hangar size
4	APXSPC	Numeric	2	Appropriate aircraft size
5	TYPCOND	Character	50	Type/condition
6	REFAREA	Character	6	Reference area
7	APRSIZSY	Numeric	7	Apron size
8	APXSPC	Numeric	3	Approximate aircraft space
9	TYPCOND	Character	50	Type condition
			131	

HSEPLFORE.DBE
Guidebook Table II-7 & Table II-8

Table III-2
HISTORICAL ENPLANEMENTS AND FORECASTS

Field	Field Name	Type	Width	Description
1	LOCID	Character	4	Four-letter airport designator
2	YR	Numeric	4	Calendar year
3	ENPL	Numeric	10	Actual enplanements
4	FORE1	Numeric	10	Forecast enplanements 1
5	FORE2	Numeric	10	Forecast enplanements 2
6	FORE3	Numeric	10	Forecast enplanements 3
7	FORE4	Numeric	10	Forecast enplanements 4
8	FORE5	Numeric	10	Forecast enplanements 5
9	FORE6	Numeric	10	Forecast enplanements 6
10	ENPDPL	Numeric	10	Enplanements/deplanements
11	AVMOPASS	Numeric	8	Average month passengers
12	PKMOPASS	Numeric	8	Peak-month passengers
13	DAYPKMOPASS	Numeric	6	Daily peak-month passengers
14	TPHP	Numeric	6	Typical peak-hour passenger
			116	

GADATA.DBF
Guidebook Table II-9

Table III-3
GENERAL AVIATION DATA

Field	Field Name	Type	Width	Description
1	LOCID	Character	4	Four-letter airport designator
2	YR	Numeric	4	Calendar year
3	BSDSGLENG	Numeric	5	Based single engine aircraft
4	BSDJETENG	Numeric	5	Based jet engine aircraft
5	BSDMULTENG	Numeric	5	Based multi-engine aircraft
6	BSDHELICOP	Numeric	5	Based helicopters
7	BSDOTHERS	Numeric	5	Based other aircraft
8	LOCOPS	Numeric	10	Local operations
9	ITOPS	Numeric	10	Itinerant operations
10	IFROPS	Numeric	10	IFR operations
11	PDOPS	Numeric	10	Peak-day operations
12	TOTOPS	Numeric	10	Total operations
			83	

PKHRGATE.DBF
Guidebook Table II-13

Table III-4
PEAK-HOUR GATE REQUIREMENTS

Field	Field Name	Type	Width	Description
1	LOCID	Character	4	Four-letter airport designator
2	GATEDESC	Character	17	Gate description
3	BYRDATA	Numeric	15	Base year data
4	FIVEYRDATA	Numeric	15	Fifth year data
5	TENYRDATA	Numeric	15	Tenth year data
6	TWENYRDATA	Numeric	15	Twentieth year data
			81	

DYVUSEFORE.DBF
Guidebook Table II-14

Table III-5
FORECAST OF DAILY VEHICLES FOR ENPLANED PASSENGERS

Field	Field Name	Type	Width	Description
1	LOCID	Character	4	Four-letter airport designator
2	YR	Numeric	4	Calendar year
3	USEDESC	Character	33	Vehicle use description
4	PERCAR	Numeric	6	Personal car
5	RENTCAR	Numeric	6	Rental car
6	TAXI	Numeric	6	Taxi
7	VANLIM	Numeric	6	Van/limo
			65	

RUNCAPAN.DBF
Guidebook Table II-18

Table III-6
RUNWAY CAPACITY ANALYSIS

Field	Field Name	Type	Width	Description
1	LOCID	Character	4	Four-letter airport designator
2	EXRUNCAP	Numeric	10	Existing runway capacity
3	FORE	Numeric	10	Twenty year forecast
4	CAP	Numeric	4	Twenty year forecast percent of capacity used
			28	

WINDPER.DBF
Guidebook Table II-19

Table III-7
WIND PERSISTENCY

Field	Field Name	Type	Width	Description
1	LOCID	Character	4	Four-letter airport designator
2	RUN	Numeric	8	All weather conditions runway
3	PERCOV	Numeric	4	All weather conditions percent coverage
4	INSTRUN	Numeric	8	Instrument conditions runway
5	IPERCOV	Numeric	4	Instrument conditions percent coverage
			28	

FUELMSTRQ.DBF
Guidebook Tables II-20 & II-21

Table III-8
PROJECTED FUEL DEMAND

Field	Field Name	Type	Width	Description
1	LOCID	Character	4	Four-letter airport designator
2	YR	Numeric	4	Calendar year
3	PISACOPS	Numeric	10	Piston aircraft operations
4	PGALPEROPS	Numeric	4	Gallons per piston operation
5	ANNAGDEM	Numeric	10	Annual AVGAS fuel demand in gallons
6	TURACOPS	Numeric	10	Turbine aircraft operations
7	TGALPEROPS	Numeric	4	Gallons per turbine operation
8	ANNJTFLDEM	Numeric	10	Annual jet fuel in gallons
9	YEAR	Character	4	Calendar year
10	14DYAGSTRQ	Numeric	6	Fourteen-day AVGAS storage requirement
11	14DYJTSRQ	Numeric	6	Fourteen-day jet fuel storage requirement
			72	

DEVSCHCFS.DBS
Guidebook Table II-25

Table III-9
DEVELOPMENT SCHEDULE, COSTS, AND FUNDING SOURCES

Field	Field Name	Type	Width	Description
1	LOCID	Character	4	Four-letter airport identifier
2	PROJECT	Character	7	Project phase and number
3	DESCYR	Character	50	Project description and year planned
4	QUANT	Numeric	8	Quantity
5	TOTCST	Numeric	10	Total estimated cost
6	FAAELGCST	Numeric	10	FAA eligible cost
7	STELGCST	Numeric	10	State eligible cost
8	SPONMINCST	Numeric	10	Sponsor minimum cost
9	PRIOTHCST	Numeric	10	Private/other cost
			119	

F. NATIONAL PRIORITY SYSTEM (AS DETAILED IN FAA ORDER 5100.39)

ACIP Components

a. NPS Equation - The FAA uses a numerical system as one tool for prioritizing airport development. The values generated by the National Priority System (NPS) equation serve only to categorize airport development in accordance with agency goals and objectives. The NPS equation generates values between 0 and 100 with 100 generally being most consistent with agency goals.

NPS equation:

National Priority Rating = (k5*P)*[(k1*A) + (k2*P) + (k3*C) + (k4*T)]

Where: k1 = 1.00, k2 = 1.40, k3 = 1.00, k4 = 1.20, k5 = 0.25

National Priority Rating = .25P*(A+1.4P+C+1.2T)

Applying the above equation produces a numerical value between 0 and 100 depending upon the associated values for A, P, C and T. In general, projects with higher numerical values are most consistent with FAA goals and objectives. It is anticipated that, based on future experience, the individual point values and equation coefficients (k1-k5) may be adjusted slightly to reflect modified national goals. Appendix 6 (attached) provides a reference to associate specific work descriptions with work codes and national priority ratings, and for each airport code when associated with the work codes. The purpose code (P) is used twice within the equation to signify added importance.

b. Airport Code - The airport code (A) is used to identify the role and size of the airport. To provide sufficient variability to the airport size factor, the airport code is assigned a value that ranges between 2 and 5. Refer to Appendix 5 (attached) for specific point values.

c. ACIP Project Codes - A project work code is a 6-character alpha identifier consisting of three 2-character elements that express purpose, component and type. The project work code represents specific airport development and is used in the national priority system equation to produce a numerical rating. Each 2-character alpha identifier may be assigned a value ranging from 0 to 10. These identifiers are enumerated in Appendix 5 (attached).

(1) The *purpose (P)* identifier signifies the underlying objective of an airport development project (e.g., reconstruction). There are 8 *purpose* identifiers.

(2) The *component (C)* identifier signifies the physical component (e.g., runway), for which the development is intended. There are 17 *component* identifiers.

(3) The *type (T)* identifier signifies the actual work being done (e.g., extension). There are 38 *type* identifiers.

d. Definitions - Component and type identifiers are generally self-explanatory as set out in Appendix 5. Purpose codes are defined below.

(1) Safety/Security

DEFINITION: This category includes items required by regulation in 14 CFR Part 107, 14 CFR Part 139 or the Airport Certification Manual, and those safety/security items that cannot be accommodated by any other operational procedures to achieve or maintain an acceptable level of safety/security. Also included is airport hazard removal/marking.

(2) Statutory Emphasis Projects

DEFINITION: This category consists of airport development items included in section 47101(f) of Title 49 of the United States Code, such as runway grooving, friction

treatment, and distance-to-go signs on all primary and secondary runways at commercial service airports; vertical visual guidance systems on all primary runways at commercial service airports; and runway lighting, taxiway lighting, sign systems, and marking for all commercial service airports.

(3) Reconstruction/Rehabilitation

DEFINITION: This category is defined as development required to preserve, repair or restore the functional integrity of the airside servicing area.

(4) Environment

DEFINITION: This category includes actions necessary to prepare or carry out projects or programs to comply with the National Environmental Protection Act (NEPA), 14 CFR Part 150, the Clean Air Act, or other laws or regulations governing environmental matters. Such actions can be defined within environmental assessments, environmental impact statements, Part 150 Noise Compatibility Plans, and compliance orders issued by courts or Federal or State agencies having jurisdiction over compliance with environmental mandates.

(5) Planning

DEFINITION: This category includes the preliminary studies needed to define and prioritize specific airport development needs.

(6) Capacity

DEFINITION: Development items that improve an airport or system of airports for the primary purpose of accommodating more passengers, cargo, aircraft operations or based aircraft.

(7) Standards

DEFINITION: This category includes development at existing airports intended to attain recommended airport design standards based on the current design category.

(8) Other

DEFINITION: This category includes development items other than those necessary for safe and efficient airport operations, or for improvement of airside capacity. Items such as people movers, airport ground access projects, parking lots, fuel farms, and training systems are included in this category. This also includes projects for converting military airfields to civil use, such as those authorized by the MAP.

Table III-10

FAA ORDER 5100.39 APPENDIX 5 - POINT VALUES FOR AIP AIRPORT AND ACIP WORK CODES

A= Airport Code (2 to 5 pts.):

Primary Commercial Service Airports
A - Large and Medium Hub = 5 pts
B - Small and Non Hub = 4 pts

Non-Primary Commercial Service, Reliever, and General Aviation Airports

Based Aircraft/Itinerant Operations
A- 100 or 50,000 = 5 pts
B -50or 20,000 = 4 pts
C - 20or 8,000 = 3 pts
D - <20 and <8,000 = 2 pts

P = Purpose Points (0 to 10 pts)
CA = Capacity = 7 pts
EN = Environment = 8 pts
OT = Other= 4 pts
PL = Planning = 8 pts
RE = Reconstruction = 8 pts
SA = Safety/Security = 10 pts
SP = Statutory Emphasis Programs = 9 pts
ST = Standards = 6 pts

C =Component Points (0 to 10 pts)
AP = Apron = 5 pts
BD = Building = 3 pts
EQ = Equipment = 8 pts
FI = Financing = 0 pts
GT = Ground Transportation = 4 pts
HE = Helipad = 9 pts
HO = Homes = 7 pts
LA = Land = 7 pts
NA = New Airport = 4 pts
OT = Other= 7 pts
PB = Public Building = 7 pts
PL = Planning = 7 pts
RW = Runway= 10 pts
SB = Seaplane = 9 pts
TE = Terminal = 1 pt
TW = Taxiway = 8 pts
VT = Vertiport = 4 pts

T = Type Points (0 to10 pts)

60 = Outside 65 DNL = 0 pts	IM = Improvements = 8 pts	SE = Security Improvement = 6 pts
65 = 65 - 69 DNL = 4 pts	IN = Instrument Approach Aid = 7 pts	SF = RW Safety Area = 8 pts
70 = 70 - 74 DNL = 7 pts	LI = Lighting = 8 pts	SG = RW/TW Signs = 9 pts
75 = Inside 75 DNL = 10 pts	MA = Master Plan = 9 pts	SN = Snow Removal Equipment = 9 pts
AC = Access = 7 pts	ME = Metropolitan Planning = 7 pts	SR = Sensors = 8 pts
AD = Administration Costs = 0 pts	MS = Miscellaneous = 5 pts	ST = State Planning = 8 pts
AQ = Acquire Airport = 5 pts	MT= Mitigation = 6 pts	SV = Service = 6 pts
BO = Bond Retirement = 0 pts	NO = Noise Plan/Suppression = 7 pts	SZ = Safety Zone (RPZ) = 8 pts
CO = Construction = 10 pts	OB = Obstruction Removal = 10 pts	VI = Visual Approach Aids. Aid = 8 pts
DI = De-Icing Facilities = 6 pts	PA = Parking = 1 pt	VT = Construct V/Tol RW/Vert Plan = 2 pts
DV = Development Land = 6 pts	PM = People Mover = 3 pts	WX= Weather Reporting Equipment = 8 pts
EX = Extension/Expansion = 6 pts	RF = ARFF Vehicle = 10 pts	
FF = Fuel Farm Development = 2 pts	RL = Rail = 3 pts	
FR = RW Friction = 9 pts		

Table III-11

FAA ORDER 3100.39 APPENDIX 6
NPIAS-ACIP STANDARD DESCRIPTIONS, ACIP CODES, AND NATIONAL PRIORITY RATINGS

	ACIP Codes			Airport Code			
PROJECT DESCRIPTION	Purpose	Component	Type	A	B	C	D
				5	4	3	2
APRON							
Construct {name} Apron	CA	AP	CO	56	54	52	50
Expand {name} Apron	CA	AP	EX	47	46	44	42
Construct {name} Apron (environmental mitigation)	EN	AP	CO	66	64	62	60
Rehabilitate {name} Apron	RE	AP	IM	62	60	58	56
Construct {name} Apron	ST	AP	CO	46	44	43	41
Expand/Strengthen {name} Apron	ST	AP	IM	42	41	39	38
Install {name} Apron Lighting	ST	AP	LI	42	41	39	38
BUILDINGS							
<Construct/Expand/Improve/Modify/Rehabilitate> Aircraft Rescue & Fire Fighting Building	SA	BD	EX	73	71	68	66
<Construct/Expand/Improve/Modify/Rehabilitate> {describe} Building	ST	BD	MS	34	32	31	29
<Construct/Expand/Imp/Modify/Rehabilitate> <Snow Removal Equipment/Chemical Storage Buildings	ST	BD	SN	41	39	38	36
EQUIPMENT							
Acquire Driver's Enhanced Vision System	ST	EQ	MS	41	40	38	37
Acquire Interactive Training System	OT	EQ	MS	25	24	23	22
Acquire Aircraft Rescue & Fire Fighting Vehicle [required by Part 139 only]	SA	EQ	RF	98	95	93	90
Acquire Aircraft Rescue & Fire Fighting Safety Equipment {describe} [required by Part 139]	SA	EQ	RF	98	95	93	90
Acquire Security Equipment/Install Fencing {e.g., access control} [required by Part 107]	SA	EQ	SE	86	83	81	78
Acquire Aircraft Deicing Equipment	ST	EQ	DI	43	41	40	38
<Acquire/Install/Rehabilitate> Emergency Generator	ST	EQ	LI	47	45	44	42
Acquire Aircraft Rescue & Fire Fighting Safety Equipment {describe} [not required by Part 139]	ST	EQ	MS	41	40	38	37
Acquire Equipment (e.g., Sweepers, etc.)	ST	EQ	MS	41	40	38	37
Acquire Aircraft Rescue & Fire Fighting Vehicle [not required by Part 139]	ST	EQ	RF	50	49	47	46
Acquire Security Equipment/Install Perimeter Fencing {e.g., access control} [not Part 107]	ST	EQ	SE	43	41	40	38
Acquire <Snow Removal Equipment/Urea Truck/etc.>	ST	EQ	SN	48	47	45	44
Acquire Friction Measuring Equipment	ST	EQ	SR	47	45	44	42
Install Weather Reporting Equipment {describe, e.g., AWOS }	ST	EQ	WX	47	45	44	42
FINANCE							
Administrative Costs (PFC)	OT	FI	AD	0	0	0	0
Financing Costs	OT	FI	BO	0	0	0	0
GROUND TRANSPORTATION							
<Construct/Expand/Improve/Modify/Rehabilitate> <Inter/Intra> Terminal People Mover	CA	GT	PM	39	37	36	34
<Construct/Expand/Improve/Modify/Rehabilitate> <Inter/Intra> Terminal People Mover	OT	GT	PM	18	17	16	15
<Construct/Expand/Improve/Modify/Rehabilitate> Access Rail	CA	GT	RL	39	37	36	34
<Construct/Expand/Improve/Modify/Rehabilitate> Access Rail	OT	GT	RL	18	17	16	15
<Construct/Expand/Improve/Modify/Rehabilitate> Access Road	CA	GT	AC	48	46	44	42
<Construct/Expand/Improve/Modify/Rehabilitate> Access Road	OT	GT	AC	23	22	21	20
<Construct/Expand/Improve/Modify/Rehabilitate> Service Road	OT	GT	SV	22	21	20	19
HELIPORT							
<Construct/Expand/Improve/Modify/Rehabilitate> Helipad/Heliport	CA	HE	CO	63	61	59	57
<Construct/Expand/Improve/Modify/Rehabilitate> Helipad/Heliport	ST	HE	CO	52	50	49	47
RESIDENCE							
Noise Mitigation measures for residences outside 65 DNL	EN	HO	60	46	44	42	40
Noise Mitigation measures for residences within 65 - 69 DNL	EN	HO	65	56	54	52	50
Noise Mitigation measures for residences within 70 - 74 DNL	EN	HO	70	63	61	59	57
Noise Mitigation measures for residences within 75 DNL	EN	HO	75	70	68	66	64
LAND							
Acquire <land/easement> for noise compatibility/relocation {# relocated} outside 65 DNL	EN	LA	60	46	44	42	40
Acquire <land/easement> for noise compatibility/relocation {# relocated} within 65 - 69 DNL	EN	LA	65	56	54	52	50
Acquire <land/easement> for noise compatibility/relocation {# relocated} within 70 - 74 DNL	EN	LA	70	63	61	59	57
Acquire <land/easement> for noise compatibility/relocation {# relocated} within 75 DNL	EN	LA	75	70	68	66	64
Acquire <land/easement> for development/relocation {list parcels and/or # relocated}	ST	LA	DV	41	40	38	37
Acquire miscellaneous land {describe, e.g., land for outer marker, relocate road}	ST	LA	MS	40	38	37	35
Acquire land/easement for approaches {list parcels and/or # relocated}	ST	LA	SZ	45	44	42	41

	ACIP Codes			Airport Codes			
PROJECT DESCRIPTION	Purpose	Component	Type	A	B	C	D
				5	4	3	2
NEW AIRPORTS							
Construct New Airport	CA	NA	CO	54	52	50	49
Acquire [existing] Airport	ST	NA	AQ	35	34	32	31
Construct New Airport	ST	NA	CO	44	43	41	40
OTHER							
Construct Deicing Containment Facility	EN	OT	DI	61	59	57	55
Noise Mitigation Measures [miscellaneous]	EN	OT	MS	58	56	54	52
Environmental Mitigation	EN	OT	MT	61	59	57	55
Install Noise Monitoring System/Equipment	EN	OT	NO	63	61	59	57
<Construct/Improve/Repair> <Fuel Farm/Utilities> [MAP]	OT	OT	FF	20	19	18	17
<Construct/Rehabilitate> Parking Lot [non revenue producing-non hub/MAP]	OT	OT	PA	19	18	17	16
<Light/Mark/Remove> Obstructions {list location}[hazard only e.g., approaches]	SA	OT	OB	95	93	90	88
Install <Guidance Signs/ Runway Incursion Caution Bars> [required by Part 139]	SA	OT	SG	92	90	87	85
Install <Guidance Signs/ Runway Incursion Caution Bars> [non Part 139 CS]	SP	OT	SG	80	77	75	73
<Install/Rehabilitate> Airport Beacons [required by Part 139]	SA	OT	VI	89	87	84	82
Install miscellaneous <NAVAIDs/Approach Aids> {seg. circle, beacon, etc., Not ALS}	SP	OT	IN	74	72	70	68
Install miscellaneous <NAVAIDs/Approach Aids> {seg, circle, beacon, etc., Not ALS	ST	OT	IN	43	42	40	39
Improve Airport <Drainage/Erosion Control/miscellaneous improvements>	ST	OT	IM	45	44	42	41
<Light/Mark/Remove> Obstructions {location}	ST	OT	OB	49	47	46	44
Construct Aircraft Rescue & Fire Fighting Training Facility/Regional Burn Pit/Mobile Training Facility	ST	OT	RF	49	47	46	44
Install <Guidance/other> Signs [not Part 139]	ST	OT	SG	47	45	44	42
Construct Deicing Containment Facility	ST	OT	DI	41	40	38	37
PUBLIC BUILDINGS							
Noise Mitigation measures for public buildings outside 65 DNL	EN	PB	60	46	44	42	40
Noise Mitigation measures for public buildings within 65 - 69 DNL	EN	PB	65	56	54	52	50
Noise Mitigation measures for public buildings within 70 - 74 DNL	EN	PB	70	63	61	59	57
Noise Mitigation measures for public buildings within 75 DNL	EN	PB	75	70	68	66	64
PLANNING							
Conduct <Environmental Assessment/Environmental Impact Statement/Feasibility Study/Update	EN	PL	MA	68	66	64	62
Conduct Noise Compatibility Plan study/update {Part 150}	EN	PL	NO	63	61	59	57
Conduct Ground Transportation/Rail Study	PL	PL	AC	63	61	59	57
<Conduct/Update> <Airport Master Plan Study {ALP, EA, etc.}>	PL	PL	MA	68	66	64	62
Conduct/Update Metropolitan System Plan Study	PL	PL	ME	63	61	59	57
<Conduct/Update> {name} (e.g., Pavement Maintenance Plan, PCI, NPDES, etc.)	PL	PL	MS	58	56	54	52
<Conduct/Update> State System Plan Study	PL	PL	ST	66	64	62	60
Conduct Vertiport/Tilt rotor Plan	PL	PL	VT	51	49	47	45
RUNWAYS							
Construct Runway {name}	CA	RW	CO	64	63	61	59
Extend Runway {name}	CA	RW	EX	56	54	53	51
Construct Runway {name} (environmental mitigation)	EN	RW	CO	76	74	72	70
Rehabilitate Runway {name}	RE	RW	IM	72	70	68	66
Rehabilitate Runway <Lighting/Electrical Vault>	RE	RW	LI	72	70	68	66
Install Runway Lighting (HIRL, MIRL) [Required by Part 139]	SA	RW	LI	97	94	92	89
Install Runway Lighting (HIRL, MIRL) [non Part 139 CS]	SP	RW	LI	84	81	79	77
<Construct/Extend/Improve> Runway {name} Safety Area [Primary Airports]	SA	RW	SF	97	94	92	89
<Apply Friction Course/Groove> Runway	SP	RW	FR	86	84	82	80
Install Runway {name} Distance-to-Go Signs	SP	RW	SG	86	84	82	80
Install Runway {name} <Vertical/Visual> Guidance System [PAPI/VASI/REIL/ALS/etc.]	SP	RW	VI	84	81	79	77
Construct Runway {name} [includes relocation]	ST	RW	CO	53	52	50	49
<Construct/Extend/Improve> Runway {name} Safety Area [Non-Primary Airports]	ST	RW	SF	50	48	47	45
Install Runway Lighting (HIRL, MIRL, TDZ, LAHSO or CL)	ST	RW	LI	50	48	47	45
<Extend/Widen/Strengthen> Runway {name} [to meet standards]	ST	RW	IM	50	48	47	45
Install <full/partial> Instrument Approach Aid <describe, e.g., install localizer>	ST	RW	IN	48	46	45	43
Install Runway {name} Sensors	ST	RW	SR	50	48	47	45
Install Runway {name} <vertical/visual> Guidance System [PAPI/VASI/REIL/ALS/etc.]	ST	RW	VI	50	48	47	45

	ACIP Code			Airport Code			
PROJECT DESCRIPTION	Purpose	Component	Type	A	B	C	D
				5	4	3	2
SEAPLANE BASES							
Rehabilitate Seaplane <ramp/floats>	RE	SB	IM	72	70	68	66
<Construct/Improve/Modify> Seaplane ramp/floats	CA	SB	CO	64	63	61	59
<Construct/Improve/Modify> Seaplane ramp/floats	ST	SB	CO	53	52	50	49
TERMINAL DEVELOPMENT							
Construct Terminal Building	CA	TE	CO	49	47	45	43
Expand Terminal Building	CA	TE	EX	40	39	37	35
<Improve/Modify/Rehabilitate> Terminal Building	CA	TE	IM	44	43	41	39
Construct Terminal Building	ST	TE	CO	40	38	37	35
Expand Terminal Building	ST	TE	EX	32	31	29	28
<Improve/Modify/Rehabilitate> Terminal Building	ST	TE	IM	36	35	33	32
Acquire Handicap Passenger Lift Device	ST	TE	MS	31	29	28	26
TAXIWAYS							
Construct Taxiway {name}	CA	TW	CO	61	59	57	56
Extend Taxiway	CA	TW	EX	53	51	49	47
Construct Taxiway {name} (environmental mitigation)	EN	TW	CO	72	70	68	66
Rehabilitate Taxiway	RE	TW	IM	68	66	64	62
Rehabilitate Taxiway {name} Lighting	RE	TW	LI	68	66	64	62
Install Taxiway {name} Lighting (MITL) [Required by Part 139]	SA	TW	LI	92	89	87	84
Install Taxiway {name} Lighting (MITL) [non Part 139 CS]	SP	TW	LI	79	77	75	72
Construct Taxiway {name} [includes relocation]	ST	TW	CO	50	49	47	46
<Extend/Widen/Strengthen> Taxiway {name}	ST	TW	IM	47	45	44	42
Install Taxiway {name} Lighting (e.g., SMGCS, reflectors, MITL)	ST	TW	LI	47	45	44	42
Install Taxiway {name} Sensors	ST	TW	SR	47	45	44	42
VERTIPORTS							
<Construct/Expand/Improve/Modify/Rehabilitate> Vertiport	CA	VT	IM	50	48	46	44
<Construct/Expand/Improve/Modify/Rehabilitate> Vertiport	ST	VT	IM	41	39	38	36

A = Airport Code (2 to 5 pts.):

Primary Commercial Service Airports
A = Large and Medium Hubs = 5 pts
B = Small and Non Hub =4 pts

Non Primary Commercial Service, Reliever, and General Aviation Airports
Aircraft/Itinerant Operations
A = 100 or 50,000 = 5 pts
B = 50 or 20,000 = 4 pts
C = 20 or 8,000 = 3 pts
D= <20 and <8,000 = 2 pts

Priority Equation = k5*P*(k1*A+K2*P+k3*C+k4*T)

Priority Number =.25P(A+1.4P+C+1.2T)
k1 = 1.00
k2 = 1.40
k3 = 1.00
k4 = 1.20
k5 = 0.25
k6 = 0.00

Table III-12

FAA ORDER 3100.39 APPENDIX 6 - NPIAS PURPOSE, COMPONENT AND TYPES WITH VALUES

PURPOSE			COMPONENT			TYPE		
CA	7	Capacity	AP	5	Apron	60	0	Outside DNL 65dB
EN	8	Environment	BD	3	Building	65	4	DNL 65-69dB
OT	4	Other	EQ	8	Equipment	70	7	DNL 70- 74dB
PL	8	Planning	FI	0	Financing	75	10	Inside DNL 75dB
RE	8	Reconstruction	GT	4	Ground Transportation	AC	7	Access
SA	10	Safety/Security	HE	9	Helipad	AD	0	Administration Costs
SP	9	Special Programs	HO	7	Homes	AQ	5	Acquire Airport
ST	6	Standards	LA	7	Land	BO	0	Bond Retirement
			NA	4	New Airport	CO	10	Construction
			OT	7	Other	DI	6	De-Icing Facilities
			PB	7	Public Building	DV	6	Development Land
			PL	7	Planning	EX	6	Extension/Expansion
			RW	10	Runway	FF	2	Fuel Farm Development
			SP	9	Seaplane	FR	9	RW Friction
			TE	1	Terminal	IM	8	Improvements
			TW	8	Taxiway	IN	7	Instrument Appr. Aide
			VT	4	Vertiport	LI	8	Lighting
						MA	9	Master Plan
						ME	7	Metropolitan Planning
						MS	5	Misc.
						MT	6	Mitigation
						NO	7	Noise Plan/Supress Equip
						OB	10	Obstruction Removal
						PA	1	Parking
						PM	3	People Mover
						RA		Reloc Assist
						RF	10	ARFF Vehicle
						RL	3	Rail
						SE	6	Security Improvement
						SF	8	RW Safety Area
						SG	9	RW/TW Signs
						SN	9	Snow Removal Equipment
						SR	8	Sensors RW
						ST	8	St. Planning
						SV	6	Service
						SZ	8	Safety Zone (RPZ)
						VI	8	Visual Approach Aide
						VT	2	Const V/Tol RW/Vert Plan
						WX	8	Weather Reporting Equipment

Priority Equation = k5*P*(k1*A+k2*P+k3*C+k4*T)
k1 = 1
k2 = 1.4
k3 = 1
k4 = 1.2
k5 = 0.25
k6 = 0
Priority Number = 0.25P (A+1.4P+C+1.2T)

G. ABSTRACTS OF SELECTED ON-LINE RESOURCES AND UPDATED REFERENCE MATERIALS

FAA Advisory Circular 150/5020-1, *Noise Control and Compatibility Planning For Airports*
Federal Aviation Administration
Published: August 5, 1983
Retrieved From: http://www.faa.gov/arp/150acs.cfm?ARPnav=acs

Abstract

FAA Advisory Circular (AC) 150/5020-1, *Noise Control and Compatibility Planning For Airports* provides guidance for airports pursuant to the requirements of Federal Aviation Regulation (FAR) Part 150 and the Aviation Safety and Noise Abatement Act of 1979. Airport Noise Compatibility Planning has the goal of reducing existing non-compatible land uses around airports and of preventing the introduction of additional non-compatible land uses through the cooperative efforts of all those involved.

The AC provides background on the definition of noise, methods to measure it, and methods to assess its impacts. The preferred measure is an "A-Weighted" scale that adds additional emphasis on higher frequency sounds. This is because of the greater effect of higher frequencies on humans than lower frequencies. The yearly average sound levels are measured to determine applicable noise contours at a given airport. Specifically, FAR Part 150 requires that a noise exposure map for a given airport be generated via the Federal Aviation Administration's (FAA) Integrated Noise Model (or FAA-approved equivalent program). The noise exposure map shall depict contours of 65, 70, and 75 day-night average noise levels (Ldn). Within the 65 Ldn contour, the airport sponsor is required to identify land uses and to determine land use compatibility in accordance with the standards and procedures of FAR Part 150.

The basis for noise compatibility is that adverse effects of noise exposure on people can be a result of aircraft noise generated from a specific airport. The effects can be grouped into three general categories: degradation of health (hearing loss), attitudinal reactions, and activity interference.

The document also outlines how to determine airport noise compatibility and forms the primary background for preparing airport noise compatibility programs under FAR Part 150. Noise control and noise impact abatement actions available to both the airport operator and neighboring communities are discussed. The actions include denial of use to certain aircraft, capacity limits based on noise, noise abatement takeoff or approach procedures, installation of noise barriers, and easements. The positives and negatives of each action are also discussed.

FAA Advisory Circular 150/5050-4, *Citizen Participation in Airport Planning*
Federal Aviation Administration
Published: September 26, 1975
Retrieved From: http://www.faa.gov/arp/150acs.cfm?ARPnav=acs

Abstract

FAA Advisory Circular 150/5050-4, *Citizen Participation in Airport Planning* provides guidance for public involvement in airport planning. It demonstrates the desirability and need for early citizen participation and the methods by which this participation may be achieved. Two levels of citizen participation are outlined: a minimal level program for simple and non-controversial studies and a comprehensive program suitable for complex and/or controversial studies.

There are two basic elements in a minimal level program. The first is a public information program that is designed to keep the public informed of the direction and character of the study and the decisions that have been made. The second element is a series of public information meetings that are held at significant milestones in the planning process. These meetings brief citizens on the study and give them an opportunity to express their views. This minimal level program is best suited for small airport master plans that do not involve controversial issues.

The higher level of citizen participation can be found in a comprehensive program. This program consists of a citizen-planning group, which is open to all interested citizens. This group works and interacts with the planners in identifying the issues, relating them to community goals and values, and leading to the selection of alternatives.

Throughout the advisory circular emphasis is placed upon getting citizens involved early in the planning process and on the early identification of potentially controversial issues or choices. This should be done before any irreversible decisions have been made and before any alternatives have been taken off the table. The AC notes that keeping the citizens involved in the planning process from the beginning to the end makes it less likely that controversy will arise late in the process.

FAA Advisory Circular 150/5060-5, *Airport Capacity and Delay*
Federal Aviation Administration
Published: September 23, 1983
Revised: December 1, 1995
Retrieved From: http://www.faa.gov/arp/150acs.cfm?ARPnav=acs

Abstract

This FAA Advisory Circular explains how to compute 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. The method for computing airport capacity and aircraft delay is the throughput method provided in this AC.

The first chapter of the AC provides an overview of airport capacity and aircraft delay analysis. Important definitions are provided in order to familiarize the reader with terminology to be used throughout the document.

Chapters two through four contain calculations for computing airport capacity, annual service volume, and aircraft delay for long-range evaluations. An airport's capacity and annual service volume are influenced significantly by runway use configurations, percentage of touch-and-goes as compared to arrivals and departures, taxiway configurations, airspace limitations, runway instrumentation, and fleet mix. Applicable charts and figures are provided to assist in the computations.

Chapter Five identifies computer models that may be used to refine runway capacity and aircraft delay analysis. These models include SIMMOD, ADSIM, Airfield Capacity Model, and Airport Design Computer Model. These models provide accurate information – provided the input is adequate.

Appendices 1, 2, and 3 offer examples of the calculations that are illustrated in the main body of the AC. These examples are very useful in understanding how each calculation applies to the evaluation of alternatives. Appendix 4 is a glossary of terms, while Appendix 5 provides worksheets that can be used to organize the analyst's numbers when doing the computations in the examples.

FAA Advisory Circular 150/5070-6, *Airport Master Plans*
Federal Aviation Administration
Published: July 29, 2005
Retrieved From: http://www.faa.gov/arp/150acs.cfm?ARPnav=acs

Abstract

FAA Advisory Circular 150/5070-6, *Airport Master Plans* provides guidance for the preparation of master plans for airports that range in size and function from small general aviation to large commercial service facilities.

An overview of airport master planning studies and a summary of the pre-planning process is provided. The AC provides a pre-planning process that includes the identification of the need for the study, a determination of the type of study, the selection of consultants, the development of the scope, the negotiation of consultant contracts, and the application for Federal funding. A detailed discussion of the various content elements contained in master plan studies is outlined. These could include public involvement programs, existing conditions, aviation forecasts, facility requirements, alternatives development and evaluation, airport layout plans, facilities implementation plan, environmental strategy plan, and a financial action plan.

When outlining a public involvement program, it is suggested that early involvement be a key part of the program. If public involvement is not initiated until late in the study's progression, the public may feel some resentment toward decisions being made without their input. Most of the data to be used in later phases will be collected when an evaluation of existing conditions takes place. The broad categories of information to be collected include the history of the airport, physical facilities on the airport, the regional setting of the airport and surrounding land uses, the environmental setting of the airport, socioeconomic and demographic data for the airport service area, historical aviation activity and airport business affairs.

The aviation forecasts in the master plan study should include a near-term, mid-range, and long-range forecast. These forecasts then become the basis for planning new or expanded facilities. In order to accommodate the forecast activity, additional facilities may be required. Therefore, a section of the master plan should address what, if any, facilities will be needed in the future to accommodate demand, update aging infrastructure, or meet new standards. Once facility requirements have been identified, the study should develop and evaluate alternatives. This process involves a detailed evaluation of the alternatives with input from all stakeholders, including the public.

The development of the Airport Layout Plan (ALP) depicts existing airport facilities and proposed developments as determined from the planners' review of the aviation activity forecasts, facility requirements, and alternatives analysis. The AC outlines which portions of an ALP package are required, along with additional elements that may be helpful in studies that are more complex. A capital improvement plan (CIP) should be developed in order to organize a schedule for facility implementation and financial actions. Finally, although there should not necessarily be a separate section for an environmental strategy plan, all issues should be looked at from an environmental perspective throughout the planning process. Appendix E of the AC provides the FAA white paper, "Consideration of Environmental Factors in Airport Master Planning."

Other appendices include a glossary of terms, applicable references, information on planning airports for business jets and a checklist for ALP drawing sets.

FAA Advisory Circular 150/5070-7, *The Airport System Planning Process*
Federal Aviation Administration
Published: November 10, 2004
Retrieved From: http://www.faa.gov/arp/150acs.cfm?ARPnav=acs

Abstract

FAA Advisory Circular 150-5070-7 *The Airport System Planning Process* provides guidance for use in accomplishing effective airport system planning. The primary purpose of airport system plan is to study the performance of an entire aviation system by understanding the interaction of the member airports. This AC is structured to guide the planner through this process.

The philosophy behind the continuous airport system planning process is described along with the products that result from the planning process; the procedures to be used in the development of a multi-state, individual state, or metropolitan area system plan project; and the elements that should be included in the project's final report.

The AC also explains how an entity should conduct a review and appraisal of the current airport system plan. In addition, it provides steps in evaluating the need for strategic planning to address future concerns in the state or metropolitan airport system.

Special studies are also covered in the AC, whether they are to be a part of the framework of the system plan or through a separate supplemental study. These studies should be undertaken to analyze new issues or to address unique situations or problems that were identified during the basic airport system planning process. These studies can be useful in providing special analysis and data from multiple airports and may decrease master planning resource requirements for individual airports. Airport System plans can be developed through AIP grants acquired by state or metropolitan airport system planning agencies.

FAA Advisory Circular 150/5100-14, *Architectural, Engineering, and Planning Consultant Services*
Federal Aviation Administration
Published: February 16, 1994
Retrieved From: http://www.faa.gov/arp/150acs.cfm?ARPnav=acs

Abstract

FAA Advisory Circular 150/5100-14, *Architectural, Engineering, and Planning Consultant Services* provides guidance for airport sponsors in the selection and use of architectural, engineering, and planning consultants under Federal Aviation Administration (FAA) airport grant programs.

The AC begins by outlining the different types of consultant services that are covered in the document. These include planning consultants, architectural/engineering consultants, and special service consultants. The specific expertise that each type of consultant should bring to a project is detailed in the AC.

The procedures for the selection of consultants are provided along with the Federal regulations that govern such procedures. To ensure equitable competition and to avoid any suggestion of unfair or unethical conduct, the selection of consultants should be made based on fair negotiations and equitable fees. Consultant selections should be based on integrity, record of past performance, extent of experience the consultant has with the type of services required by the sponsor, technical resources, and accessibility to other resources. Before the final decision, cost estimates shall be negotiated and the airport sponsor may solicit help from a non-competing consultant to assist in the process.

The negotiation of the contract between the airport sponsor and the consultant – along with its format and provisions – are the next step in the process. This contract should state the parties to the contract, define the complete extent and character of the work to be performed, outline the terms and payment for various services, and provide a detailed scope of the consultant effort.

The various methods for the costing of services rendered by the consultant are provided. These include, per diem, retainer method, cost-plus-fixed-fee, fixed lump sum, and cost-plus-a-percentage-of-cost. The costs that are allowable and not allowable under Federal regulations are also outlined.

Appendix 1 provides a detailed look at the contractor's contractual requirements. Appendix 2 provides an example of how a scope of work should be developed. Appendix 3 provides a worksheet that may be used by the consultant or airport sponsor in determining an approximate cost for consultant services rendered, while Appendix 4 provides a more detailed breakdown of associated costs. Appendix 5 provides an example of how to keep records of negotiations with consultants that can be used by the airport sponsor when preparing such a submittal to the FAA at the conclusion of the consultant selection process.

Currently, an update to this AC is under development as A/C 150-5100-14D, which is out in draft form.

FAA Advisory Circular 150/5190-4, *A Model Zoning Ordinance to Limit Height of Objects Around Airports*
Federal Aviation Administration
Published: December 14, 1987
Retrieved From: http://www.faa.gov/arp/150acs.cfm?ARPnav=acs

Abstract

FAA Advisory Circular 150/5190-4, *A Model Zoning Ordinance To Limit Height of Objects Around Airports* addresses the developments of ordinances to control the height of objects that affect navigable airspace based on the obstruction hazards described in Federal Aviation Regulation (FAR) Part 77. A zoning ordinance limits the height and location of obstructions to prevent obstructions from impeding into prescribed obstruction surfaces.

It is noted that airport zoning ordinances specifically addressing height limitations do not, in themselves, ensure compatible land use surrounding the airport. Therefore, land-use zoning that incorporates height-limiting criteria is an appropriate means for achieving this objective.

The model zoning ordinances included in this AC define and provide for the establishment of various zones and prescribe height limitations for each zone as required. This serves to prevent the creation or establishment of buildings, towers, or other objects that would interfere with the operation of an airport. These zones will vary depending on the type, size, and layout of the runways.

The appendices of this AC provide sample ordinances that are in a format so that the user may simply fill in the blanks and easily construct a zoning ordinance suitable for use at an applicable airport. The sample ordinance given in Appendix 1 is a general model for all airports. In Appendix 2 a sample ordinance for a utility-type airport without instrument approach procedures is provided, while Appendix 3 provides a sample ordinance for larger than utility airports with instrument approaches.

FAA Advisory Circular 150/5200-33, *Hazardous Wildlife Attractants on or Near Airports*
Federal Aviation Administration
Published: August 28, 2007
Retrieved From: http://www.faa.gov/airports/resources/advisory_circulars/media/150-5200-33B/150_5200_33b.pdf

Abstract

FAA Advisory Circular 150/5200-33, *Hazardous Wildlife Attractants on or Near Airports* contains guidance for specific land-uses that have the potential to attract hazardous wildlife on or near public-use airports. Historically, wildlife aircraft strikes have resulted in the loss of hundreds of lives worldwide, as well as billions of dollars in damage to aircraft.

Section 1 of the Advisory Circular discusses the separation criteria for hazardous wildlife attractants on or near airports that serve both piston and turbine powered aircraft. Approach and departure airspace is also identified, as well as recommendations of how to protect that airspace.

Section 2 of the Advisory Circular defines waste disposal operations, as well as other attractants for hazardous wildlife. The section addresses in detail the siting for solid waste landfills, enclosed trash transfer stations, underwater waste discharge, recycling centers, constructions and demolition debris facilities, fly ash disposal, and composting operations on or near airport property. This section also discusses the water management and wastewater treatment facilities and the impact, siting and mitigation of these facilities that are near airport property. Wetlands are defined, as well as how to mitigate wetlands for airport projects. Agricultural activities are discussed and land uses such as golf courses and landscaping are recommended for land uses around airport property.

Section 3 of the Advisory Circular recognizes the different agencies and documents that must be followed when preparing a Wildlife Hazard Management Plan. In addition, this section identifies the coordination between all of the Federal agencies, as well as local coordination and coordination and notification to airmen. The last section addresses waste management facilities and land-use changes near the vicinity of the airport. The Appendix of this Advisory Circular defines the terms used in this document.

FAA Advisory Circular 150/5200-34, *Construction or Establishment of Landfills Near Public Airports*
Federal Aviation Administration
Published: August 26, 2000
Retrieved From: http://www.faa.gov/arp/pdf/landfil2.pdf

Abstract

FAA Advisory Circular 150/5200-34, *Construction or Establishment of Landfills Near Public Airports* contains guidance for complying with new Federal statutory requirements regarding the construction or establishment of landfills near public airports. A municipal solid waste landfill (MSWLF) near a public airport poses a potential hazard to aircraft operations because such a waste facility attracts birds. Therefore, this AC contains provisions for complying with the statute in order to mitigate this danger.

The landfills that are covered by this statute are those where construction or establishment began after April 5, 2000. However, this statute does not cover the expansion of a MSWLF established before April 5, 2000.

The airports that fall under the provisions of this statute are those airports classified as non-hub primary, non-primary commercial service, or general aviation airports. Additionally, these airports must meet the following conditions: are recipients of Federal grants, are under the control of a public agency, serve scheduled air carrier operations conducted in aircraft with fewer than 60 seats, and of the total annual air carrier enplanements at least 51 percent depart on aircraft with less than 60 passenger seats.

Those landfills that are covered by this statute must be constructed a minimum of six statute miles from an airport that falls under the provisions of this statute. In determining this distance, measurements should be made from the closest point of the airport boundary to the closest point of the MSWLF boundary. It is the responsibility of the new MSLWF proponent to determine the applicable distance.

An exemption process is provided under the statute. The aviation agency of the state in which the airport is located must request the exemption. The Federal Aviation Administration may approve such an exemption if it is determined that such an exemption would have no adverse impacts on aviation safety.

FAA Advisory Circular 150/5300-13, *Airport Design*
Federal Aviation Administration
Published: September 29, 1989
Retrieved From: http://www.faa.gov/arp/150acs.cfm?ARPnav=acs

Abstract

FAA Advisory Circular 150/5300-13, *Airport Design* contains the Federal Aviation Administration's (FAA) standards and recommendations for airport design. For airport projects receiving Federal grants, the use of these standards is mandatory.

The AC is divided into sections that describe the various elements of a civil airport. These elements consist of airport geometry, runway design, taxiway and taxilane design, surface gradient and line of site requirements, site requirements for navigational aids and Air traffic Control (ATC) facilities, runway and taxiway bridges, and the effects and treatment of jet blast.

Chapter 1 provides useful definitions of terms that are used throughout the AC, as well as short descriptions of certain concepts. The reader should understand these terms and concepts, as they help in the comprehension of the various elements of the AC.

Chapter 2 deals with airport geometry and presents airport geometric design standards and recommendations that will help ensure the safety, economy, efficiency, and longevity of an airport. The elements within this chapter include runway location and orientation, additional runway requirements, separations standards for multiple runways, taxiway system importance, and the object clearing criteria. Vital information is placed in tables and diagrams.

Chapter 3 provides a more detailed look at runway design, describing not only standards for runways, but also associated runway elements. The standards for the length and width of runways are addressed and it is noted that airplane flight manuals for the airport's critical design aircraft should be consulted. Additionally, standards are provided for runway-associated elements such as shoulders, blast pads, runway safety areas, obstacle free zones, object free areas, clearways, stopways, and access roads for aircraft rescue and firefighting. Some of these standards are provided in easy-to-read tables that segregate the information based on approach categories and airplane design groups.

Chapter 4 presents the design standards for taxiways, taxilanes, and associated airport elements. Dimensional standards are provided for taxiways and taxilanes along with standards for their associated elements. The taxiways are broken down into their various types, which include intersecting taxiways, entrance taxiways, bypass taxiways, turnaround areas, dual, parallel taxiways, taxiways between parallel runways, exit taxiways, and apron taxiways. The standards for taxiway-associated elements such as shoulders, object-free areas, and holding bays are provided in tables and diagrams based on the airplane design groups.

Chapter 5 presents gradient and line-of-sight standards. The main purpose of these standards is to provide pilots using the runways and taxiways a line of sight to all operational areas within an appropriate distance to verify they are clear of other aircraft, vehicles, wildlife, or any other objects that may be hazardous to the operation of the aircraft. Additionally, ATC workers should be able to see all operational areas. The standards are broken down into approach categories. The grades associated with these standards are given for runways, taxiways, stopways, runway blast pads, and aprons. Specific line-of-sight standards are given for various runway configurations and taxiways.

Chapter 6 presents siting and clearing requirements for the navigational aids and ATC facilities that influence airport planning. Specific requirements for the location and separation of these facilities are provided with the help of numerous diagrams for facilities including: a

Microwave Landing System, an Instrument Landing System, a Non-Directional Beacon, a Very High Frequency Omnirange, approach lighting systems, ATC towers, and automated weather observation stations.

Chapter 7 presents guidance for considering building a runway or taxiway bridge over existing surface transportation modes. Considerations include the site, dimensions, load considerations, marking, and lighting. Specific design features of the proposed bridge are also provided.

Chapter 8 deals with the effects and treatment of jet blast. The main methods for mitigating the effects are blast fences, shoulders, and blast pads. Figures and tables are provided that outline the velocity of the jet blast at various distances from the source. Additional figures provide design diagrams for various types of blast fences.

The appendices of this AC provide a substantial amount of supporting information for the design aspects of an airport. Appendix 1 deals with the collection of wind data and its usefulness in preparing a wind rose for establishing the preferred orientation of proposed runways, while appendices 2, 3 and 4 provide detailed information on thresholds, airport reference points, and compass calibration pads.

Appendix 5 provides guidelines on airport buildings, airport parking, and tiedowns at small airports. This includes a diagram of a general layout of a small airport along with associated tiedown and T-hangar layouts. Appendices 6 and 7 discuss Airport Layout Plans (ALPs), their components, and preparation, while Appendices 8 and 9 provide the rationale behind the standards for runway and taxiway design.

Appendix 10 details the in-depth methodology for taxiway fillet design. Included are diagrams to give the reader a visual picture of the mathematical terms and symbols used in this methodology. This methodology is a small part of the computer program outlined in Appendix 11 called Airport Design, version 4.2. This program utilizes FAA design standards and methodologies to provide an electronic interface for the design of civil airports. Appendices 12 and 13 provide significant airplane data and data tables to be used when designing an airport. Appendix 14 outlines the concept and uses of declared distances. These are for use at existing airports where it is impractical to provide the runway safety area, the runway object free area, or the runway protection zone in accordance with FAA design standards.

Appendix 15 provides guidance for the preparation of electronic data sources for transfer between the FAA, airport sponsors, and consultants. The purpose is to create an open and free exchange of data in order to keep all databases up to date. Appendix 16 applies to the establishment of new authorized instrument approach procedures. It identifies airport landing surface requirements to assist airport sponsors in their evaluation and preparation of the airport-landing surface to support new instrument approach procedures. Appendices 17 and 18 provide acronyms and an index respectively.

FAA Advisory Circular 150/5300-16 *General Guidance and Specifications for Aeronautical Surveys: Establishment of Geodetic Control and Submission to the National Geodetic Survey*
Federal Aviation Administration
Published: September 15, 2007
Retrieved From: http://www.faa.gov/airports/resources/advisory_circulars/media/150-5300-16A/150_5300_16a.pdf

Abstract

Advisory Circular 150/5300-16, *General Guidance and Specification for Aeronautical Surveys: Establishment of Geodetic Control and Submission to the National Geodetic Survey* provides specifications for establishing geodetic control on or near an airport. This AC also provides guidance on how to submit the information to the National Geodetic Survey (NGS) for approval and inclusion in the National Spatial Reference System (NSRS), and how to report deviations, unusual circumstances and other issues described in the general specification chapter. The use of these guidelines is not mandatory unless Federal grant assistance is used.

The establishment of geodetic control by survey monuments in the airport vicinity is critical to the National Airspace System (NAS). These monuments and their accurate relationship to the National Spatial Reference System (NSRS) assure accuracy between surveyed points on an airport and between these monuments and other surveyed points in the NAS, including satellites.

This AC discusses the difference between permanent and temporary controls when airport requires geodetic control monumentation. Weekly reports and other reports are defined and described, as well as how to present the original data.

All surveying and positioning must be tied to the NSRS. The NSRS is discussed in detail in the Appendices of this Advisory Circular. The Advisory Circular has a set of glossary terms as well as references that can be used for further information in regards to the NSRS.

Quality control is defined to check all data and ensure completeness, reliability, and accuracy. A Quality Control Plan (QCP) covering all project tasks prior to beginning survey work must be submitted for approval. The data formats are identified and defined. Once the QCP is in place and approved, the survey work can begin. The AC provides extensive discussion of survey work, including reconnaissance, control stations, contact with airport authorities, mark recovery and pencil rubbings, as well as other items. Photographs and the information required are discussed.

Guidelines for airport geodetic control surveys are discussed, including how to select the monuments, use of existing stations and control stations, and how to prioritize these stations. Accuracy standards and Global Positioning System (GPS) requirements are described. The Advisory Circular recommends survey equipment to use and explains how to set up the equipment. Finally, there are formulas and instructions for processing the data and discussions on the format and contents of the final project report. Appendices cover topics from the NSRS to survey disk diagrams, airport interview checklists, writing station descriptions, examples of coordinate comparison spreadsheets, station table forms, examples of GPS observation schemes, outlines for processing airport geodetic control surveys, a project submission checklist, and a list of resources available on the internet.

FAA Advisory Circular 150/5300-17, *General Guidance and Specifications for Aeronautical Survey Airport Imagery Acquisition and Submission to the National Geodetic Survey*
Federal Aviation Administration
Published: March 29, 2006
Retrieved From:
http://www.airweb.faa.gov/Regulatory_and_Guidance_Library/rgAdvisoryCircular.nsf/0/2c8981660e413f628625714c0066f477/$FILE/AC150-5300-17.pdf

Abstract

FAA Advisory Circular 150/5300-17, *General Guidance for Aeronautical Survey Airport Imagery Acquisition and Submission to the National Geodetic Survey* provides specifications for airport imagery acquisition, guidelines for submittals, approval of the imagery to the National Geodetic Survey (NGS) and airport engineering surveys.

The Aeronautical Survey Program (ASP) at the NGS is tasked to perform quality assurance on all airport surveys contracted by state aviation agencies and local airport authorities. All positional data provided under these guidelines must be referenced to the National Spatial Reference System (NSRS). Horizontal positions need to be referenced to North American Datum of 1983 (NAD 83) and vertical positions need to be referenced to National American Datum of 1988 (NAVD88). In order to exceed or deviate from the specifications to the NGS, written justification must be provided to the FAA through the airport sponsor.

The AC outlines the different deliverables that need to be completed and information that needs to be provided. All imagery must be geo-referenced, and the AC provides the required referencing for the imagery, camera calibration, and the required contents of the final report. Natural occurrences such as clouds, tree leaves, sun angle, and other variables are addressed in the Advisory Circular. Finally, image quality is expected to meet the highest of professional standards and points of contact are identified for further interpretation of the Advisory Circular.

FAA Advisory Circular 150/5300-18, *General Guidance and Specifications for Submission of Aeronautical Surveys to NGS: Field Data Collection and Geographic Information System (GIS) Standards*
Federal Aviation Administration
Published: May 21, 2009
Retrieved From: http://www.faa.gov/airports/resources/advisory_circulars/media/150-5300-18B/150_5300_18b.pdf

Abstract

FAA Advisory Circular 150/5300-18, *General Guidance and Specification for Submission of Aeronautical Surveys to NGS: Field Data Collection and Geographic Information System (GIS) Standards* provides specifications for the collection of airport data through field and office methodologies in support of the FAA. The primary purpose of these guidelines and specifications is to list the requirements for data collections conducted at airports in support of the FAA Airport Surveying Geographic Information System (GIS) Program. The guidelines in this Advisory Circular are only mandatory if the collection of geospatial airport and aeronautical data are funded under Federal grant assistance programs.

The Advisory Circular introduces general guidance and specifications for data to be collected, while also trying to minimize costs to airports. The collection and maintenance of the data for airports is a responsibility of the FAA and the Airport sponsor. This document provides general specifications, standards and guidelines for collecting and maintaining airport and related aeronautical data. Contractor requirements are identified in the Advisory Circular.

Survey specifications and standards are discussed, and it is stated that independent verification and validation of airport safety data is critical to the program. Reporting requirements for proper reporting to the FAA of independent validation and verification are outlined in this section. There are many types of airport survey projects and the Advisory Circular identifies and discusses each type of project.

The Advisory Circular discusses geospatial specifications and standards and goes into detail about integrating GIS and engineering data. The relationship between GIS features and CADD layers is discussed in terms of geometric features, attributes, metadata and coordinate systems. Data translation, the use of existing data, maintenance data and preparing data for submission to the FAA is outlined. The data migration tool is a tool that translates objects from GIS to CADD. It is explained in detail at the end of Chapter 4.

The last chapter provides recommendations for naming data group data (Airfield, Airspace, Geospatial, etc.) and objects within that group. The recommendations provide information about line types, color (Microstation/CADD), line type, layer, horizontal and vertical accuracy, feature name, feature type and other general data requirements.

Appendices contain additional references; glossary and acronyms; aeronautical survey guidance and specifications; runway stopway and displaced threshold end identification monumentation; and truncated attribute values to be used with ESRI (GIS) shapefiles. Finally, there is a list of reference figures and tables.

FAA Advisory Circular 150/5325-4, *Runway Length Requirements for Airport Design*
Federal Aviation Administration
Published: July 1, 2005
Retrieved From: http://www.faa.gov/arp/150acs.cfm?ARPnav=acs

Abstract

FAA Advisory Circular 150/5325-4, *Runway Length Requirements for Airport Design* provides guidance for airport designers and planners in determining recommended runway lengths for new runways or extensions to existing runways. It provides guidelines, airplane performance data curves, and tables to assist in the process. The AC is mandatory for airport projects receiving federal funding.

The entire usable length of a runway may not be usable for all types of airplane operations. The goal is to construct an available runway length for new runways or extensions to existing runways that is suitable for forecasted critical design airplanes. Airports working with airport designers and planners should validate future runway demand by identifying the critical design airplanes.

This AC uses a five-step procedure to determine recommended runway lengths for a selected list of critical design airplanes. Step one is to identify the list of critical design airplanes for a planning period of five years. Federally funded projects require that critical design airplanes have at least 500 itinerant operations at an airport annually.

The second step is to identify the airplanes that will require the longest runway lengths at maximum certificated takeoff weight (MTOW). The AC requires that regional jets shall fall under runway length criteria for aircraft having MTOW of 60,000 pounds or more, even if the applicable regional jet has a MTOW of less than 60,000 pounds.

The third step in the procedure is to use the selected aircraft identified in step two to determine the method that will be used in establishing the recommended runway length. This consists of using tables to determine the category under which the critical aircraft falls. In the case of regional jets and those aircraft with a MTOW that is greater than 60,000 pounds, the airplane's manufacturer publishes separate required runway design lengths for their aircraft.

Step four is to use the prescribed criteria for the selected category or aircraft to determine the recommended runway length. Chapters Two, Three, and Four of the AC outline these criteria.

The final step is to make any adjustments necessary as detailed in the AC. This may be due to runway gradient, non-standard average temperatures, or airline-specific procedures. These length adjustments result in a final recommended runway length.

Appendix 1 provides a listing of websites that can be used to access manufacturer's Airport Planning Manuals. Appendix 2 provides selected Federal Aviation Regulations that pertain to runway length requirements. Appendix 3 gives examples of the process of runway length determination for a Boeing 737 and a Saab Fairchild 340B using the manufacturer's recommended criteria.

FAA Advisory Circular 150/5360-9, *Planning and Design of Airport Terminal Building Facilities at Non-Hub Locations*
Federal Aviation Administration
Published: April 4, 1980
Retrieved From: http://www.faa.gov/arp/150acs.cfm?ARPnav=acs

Abstract

FAA Advisory Circular 150/5360-9, *Planning and Design of Airport Terminal Building Facilities at Non-Hub Locations* is a general reference for planners in the planning and design of facilities for non-hub airport terminals.

After a brief introduction of non-hub airports and a description of specific functions of such an airport's terminal, the AC provides a general overview of the financial factors to consider when designing a terminal facility. These include the funding sources of the facility, revenue-estimating techniques, how revenues will likely vary with passenger traffic, and the annual costs associated with a terminal building. The AC provides a worksheet to estimate excess revenues or costs the building may generate.

Factors associated with terminal site selection are also detailed. These include distance from access roadways, runways, and parking areas.

An overview of traffic patterns for foot and automobile traffic is provided along with diagrams. Location of parking facilities, parking exits, and ticket counter entrances are all major considerations. It is also noted that provisions should be taken in the design of all facilities to allow for possible future expansion. If steps to do so are not taken in the original design of these facilities, growth may become very expensive to the airport sponsor in the future.

Airside planning considerations are also considered, including concourse design and aircraft parking configurations. Examples of poorly designed facilities are given, along with properly designed facilities.

Demand forecasts are considered in order to explain how they help planners determine future terminal requirements. Rules-of-thumb computations of facility requirements for given demand levels are provided. Additionally, graphs are provided to assist the planner in making rough estimates of number of aircraft parking positions and automobile parking spaces. Square foot area recommendations are provided in graph form for lobbies, queuing areas, ticket counter space, airline office space, outbound baggage space, baggage claim public space, baggage claim, counter space, and concession space. Special considerations such as handicap access, energy conservation, and noise attenuation, are outlined in the AC.

The Appendix provides a bibliography for the reader to reference for more detail.

FAA Advisory Circular 150/5360-13, *Planning and Design Guidelines for Airport Terminal Facilities*
Federal Aviation Administration
Published: April 22, 1988
Retrieved From: http://www.faa.gov/arp/150acs.cfm?ARPnav=acs

Abstract

Advisory Circular 150/5360-13 *Planning and Design Guidelines for Airport Terminal Facilities* presents guidance material for the planning and design of airport terminal buildings and related access facilities. Provided are general guidelines and approximations for determining space and terminal facility requirements for planning purposes.

Chapter 1 of the AC notes that, prior to initiating the design of an airport terminal; the current master plan for the airport under study should be reviewed, as it contains considerable information useful to the terminal planner and designer. Also provided are examples of factors that may influence the proposed terminal's size and design, along with certain site considerations. The AC outlines the various methodologies used in planning an effective terminal design, including how forecasts can be used effectively when planning for number of gates, apron area size, waiting area size, ticket counter space, and public parking spaces, among many other design considerations. The preferred method of converting planning statistics to daily and ultimately hourly demand baselines is the Average Day/Peak Month (ADPM) method. The basic premise is to design the airport terminal for a specified design year in the future based on the peak hour of the average day of the peak month forecasted for that year. The AC explains that this is the most common methodology, as it usually prevents overbuilding of a terminal facility.

The functional relationships of the various terminal concepts are described. A good terminal design incorporates a layout in which the various components are located in a sequence or pattern that coincides with the natural movement and services each likely requires. Figures are given to illustrate these functional relationships and diagrams of various terminal designs are given in order to show the relationship between terminal components.

Included in the details for terminal apron areas are the four primary considerations that govern efficient apron area design:

- The movement and physical characteristics of the aircraft to be served
- The maneuvering, staging, and location of ground service equipment and underground utilities
- The dimensional relationships of parked aircraft to the terminal building
- The safety, security, and operational practices related to apron control

Terminal building space and facility guidelines include rough estimates of the area required for terminal facilities, the area allocated for each facility, and a breakdown of the various allocations. Charts are provided to assist the planner/designer in estimating the gross area required for various terminal uses. Variations in terminal layouts are provided to include the positives and negatives of each design.

Federal Inspection Services facilities are highlighted and the more important aspects of determining space requirements and design considerations for these particular facilities are considered. Airports with international traffic require federal inspections of passengers, aircraft, crewmembers, baggage and cargo.

Special needs users, such as those with disabilities, are addressed and the various design considerations that go into providing access to these individuals are discussed. Included are the

specific requirements that 49 Code of Federal Regulations Part 27 imposes on new airport terminals as they relate to access to those with disabilities.

An in-depth analysis of airport ground access and circulation systems is provided. A thorough analysis of motor vehicle traffic flows associated with current and projected future air-passenger demand is essential to assure that ground congestion does not become an unanticipated constraint on a passenger terminal's performance. Circulation system configurations along with terminal curb areas are detailed using diagrams to show various design possibilities.

Miscellaneous considerations are also provided, including access to secured areas, lighting, energy conservation and the architectural treatment of the building itself. Airport sponsors are encouraged to develop, use and incorporate design, art and architectural treatment to reflect local customs and community history.

Information pertaining to federal participation in the costs of airport terminal development, including surface access, under the terms of the Airport and Airway Improvement Act are presented. Outlined are the various facilities eligible for Airport Improvement Program (AIP) grants and the special requirements related to these grants.

A bibliography for more detailed documents on terminal design is provided. Worksheets for the initial planning of the terminal building along with data collection tools for such planning are also provided as well as a listing of addresses and phone numbers of the national headquarters offices of the Federal Inspections Services.

FAA Advisory Circular 150/5390-2, *Heliport Design*
Federal Aviation Administration
Published: September 30, 2004
Retrieved From: http://www.airweb.faa.gov/

Abstract

FAA Advisory Circular 150/5390-2, *Heliport Design* provides recommendations and acceptable requirements for heliport design. The AC is organized with separate chapters covering general aviation heliports, transport heliports and hospital heliports.

Design standards and issues related to general aviation heliports are provided. These are heliports used by individuals, corporations, and helicopter air taxi services. Certain "prior permission required" facilities do not have to conform to certain standards identified in the AC.

Design standards relevant to a transport heliport are developed to provide the community with a full range of vertical flight services, including scheduled service by air carriers using helicopters. In addition, corporate users and local air taxi operations may use the heliport, leading to a broad spectrum of activities that requires a more extensive airside and landside infrastructure. However, a community's investment in a heliport may be substantially less than the investment required for an airport providing the same services.

Design guidelines for hospital heliports include choosing a site close to the emergency room and one that is capable of supporting instrument operations, future expansion, and military helicopters that may be used in disaster relief efforts.

Helicopter facilities on airports must also be considered. Separate facilities for helicopter use may be needed if there is a significant amount of helicopter operations on an airport. Those persons who use helicopters to go to an airport generally require convenient access to the airport terminal and the services provided to airline passengers. Therefore, facilities such as helicopter gates or transportation to and from the terminal should be a part of the heliport design.

Recommendations to be considered in contemplating future instrument operations at a heliport are addressed, including considerations for both non-precision and precision approaches. The advent of GPS technology has expanded the use of instrument approaches to rooftops and small heliports where instrument approaches were previously impractical. Special design considerations are given in the chapters for operations in instrument meteorological conditions.

Guidance is provided for designing heliport pavements, including design loads and soil stabilization as a method of treating non-paved operational surfaces. Stabilizing the unpaved portions of the Final Approach and Takeoff area as well as any taxi routes that are subjected to rotor wash is recommended.

The appendices provide detailed information on helicopter dimensional criteria, addresses of aviation organizations, the form and proportions of certain heliport markings, and acronyms.

FAA Advisory Circular 150/5390-3, *Vertiport Design*
Federal Aviation Administration
Published: May 31, 1991
Retrieved From: http://www.faa.gov/arp/pdf/5390-3.pdf

Abstract

FAA Advisory Circular 150/5390-3, *Vertiport Design* provides guidance to planners and communities interested in developing a civil vertiport or vertistop. The use of these standards is mandatory for vertiport projects receiving federal grant-in-aid assistance. The AC describes the many design requirements for vertiports and divides these requirements into sections to include airside, airspace, landside, marking, lighting, NAVAIDs, and other tilt-rotor facilities.

Vertiports can be on airports (operating on a simultaneous but non-conflicting basis with fixed-wing traffic), can be located near city centers, or can consist of small vertistops. The difference between a vertiport and a vertistop is defined. A vertiport is an identifiable ground or elevated area; including buildings or facilities, used for the takeoff and landing of tilt rotor aircraft and rotorcraft. A vertistop is a vertiport intended solely for the purpose of dropping off or picking up passengers or cargo. Also described are Final Approach and Takeoff Areas (FATO) and Touchdown and Lift-Off Surfaces (TLOF). These terms are used frequently throughout the AC.

Dimension requirements for FATOs, TLOFs, aprons, and ramps are provided. Also included are pavement design standards as well as special winter operation challenges associated with tilt rotor and rotorcraft. Strong downwash from these aircraft increases the importance of snow and ice removal from the FATO.

Instrument Flight Rules (IFR) are broken down into non-precision and precision instrument approach procedures. Dimensions required for typical imaginary surfaces including: approach, transitional, Obstacle Free Zone, and missed approach surfaces are provided. Sponsors of the vertiport should own, or have control over, the surface under the approach, departure, and transitional surfaces out to the point where the imaginary surfaces are at least 35 feet above the highest elevation of the highest point on the TLOF. As markings for vertiports are vastly different from those of other airfields, the AC provides details on the various markings and lighting requirements. Diagrams are also provided. Microwave Landing System installations are described, along with visual glideslope indicators, wind indicators, Automated Weather Observation Systems, and Runway Visual Range installations.

A small landside section is provided to give a brief overview of the different facilities that should be considered in the construction of a vertiport. The need for these facilities will vary depending on the vertiport's location and purpose. Tilt-rotor facilities at airports are examined to determine if the runways and terminal or apron area configuration will allow tilt-rotor and rotorcraft to operate safely. Various issues dealing with having tilt-rotor operations at an airport are outlined, including the separation of tilt-rotor aircraft from other aircraft along with passenger transfer issues.

Illustrations of several concepts that apply the design standards and recommendations of this AC to the planning of a vertiport or vertistop are included. Commercial service vertiports, elevated vertiports, and vertiports on airports are covered.

FAA Advisory Circular 150/5395-1, *Seaplane Bases*
Federal Aviation Administration
Published: June 29, 1994
Retrieved From: http://www.faa.gov/arp/pdf/5395-1.pdf

Abstract

FAA Advisory Circular 150/5395-1, *Seaplane Bases* provides guidance to assist operators in planning, designing and constructing seaplane base facilities. Prior to the establishment of a seaplane base, steps must be taken to ensure the base's safety. These steps include a Notification of Seaplane Landing Area Proposal sent to the Federal Aviation Administration (FAA). The FAA will make separate determinations of the ability of the body of water and surrounding airspace to provide a safe environment and will conduct its own aeronautical study of existing objects. The FAA will then approve a Seaplane Base Layout Plan. This plan shows all known obstructions to air navigation and all proposed construction whose exact location and dimensions are identified in the plan. Applicable permits for dredging, filling, breakwaters, boat ramps, piers, bulkheads, and riprap for waterways from the United States Army Corps of Engineers must be acquired. Once permits are obtained, United States Coast Guard approval must be sought as well as state and local permitting be met.

Factors such as demand, water-operating area, and approach and departure paths that must be considered in site selection are all covered. The bottom conditions of the body of water to be used must be analyzed to determine any obstacles to the construction of docking facilities or taxi operations that may be encountered. Most importantly, a water area that has adequate length, width, and depth dimensions, as well as an unobstructed approach and departure path for the type of seaplanes to be accommodated must be chosen. Dimensional requirements for Water Operating Areas are provided in Chapter 3, as well as taxi channel dimensions and turning basin requirements. These requirements include required depth for the Water Operating Areas.

Requirements for shoreline facilities are provided. These facilities enable servicing, loading and unloading, and mooring without removing the aircraft from the water. Additionally, they provide haul-out facilities for removing seaplanes from the water for fresh water wash downs and maintenance. Service aprons, tiedowns, and administrative buildings that are frequently constructed around or near a seaplane ramp or dock are covered. Requirements as well as recommendations for improving these facilities are provided.

Developing a plan that provides a phased approach to the development of a seaplane base includes fulfilling the basic requirements, such as a suitable body of water and a mooring area; the incorporation of a ramp, service facilities, and tiedown areas; the incorporation of a hangar for service or storage of aircraft; and revenue-producing facilities. General design considerations for the construction of structures that are tailored to individual need, finances and local conditions are included, as well as recommendations for the preservation of pilings and the use of hinged connections that will adjust to fluctuations in water level.

Requirements and recommendations for the types of anchors to be used, anchor lines, mooring buoys, lighting, markings and fuel are provided. Lighting and marking requirements are provided in detail, along with additional recommendations to improve safety. Additionally, special precautions must be taken to minimize spills for aviation fuel facilities due to the facility's proximity.

Florida Statutes, Title XI Chapter 163 Part II, *Growth Policy; County and Municipal Planning; Land Development Regulation*
State of Florida
Published: 2009
Retrieved From: http://www.dca.state.fl.us/fdcp/dcp/publications/statutesruleslegisl

Abstract

This statute outlines the "Local Government Comprehensive Planning and Land Development Regulation Act". The purpose of the statute is to encourage and assure cooperation between municipalities and counties by encouraging local governments to coordinate planning and development activities, regional agencies and state government in accord with applicable provisions of law. It states that each local government is encouraged to articulate a vision of the future physical appearance and qualities of its community through its local comprehensive plan. Neighboring communities, especially those sharing natural resources or physical or economic infrastructure, are encouraged to create collective visions for greater-than-local areas.

The statute requires that the governing body of each local government shall designate and establish a "local planning agency" that will be responsible for the preparation of the comprehensive plan or plan amendment. Each comprehensive plan should have a capital improvements element designed to consider the need for and the location of public facilities. The comprehensive plan outlines principles for construction, extension, or increase in capacity of public facilities, as well as a component that outlines principles for correcting existing public facility deficiencies. Estimated public facility costs, projected revenue sources, and standards for the management of debt should be included. These components are to cover at least a five-year period and the plan, as a whole, should contain a 10-year planning period element.

For each unit of local government within an urbanized area, the comprehensive plan should also have a transportation element. This element should include issues involving airports, projected airport and aviation development, and land-use compatibility around airports. The Airport Master Plan may be incorporated into the local government comprehensive plan. If incorporated as an amendment to the comprehensive plan, it should address land use compatibility regarding airport zoning and the efficient use and operation of the transportation system and airport. It should also be consistent with the local-government transportation circulation element and applicable metropolitan planning organization long-range transportation plans and the execution of any inter-local agreements, and should address airport-related or aviation related development. The development or expansion of an airport consistent with the adopted airport master plan will not be subject to a Development of Regional Impact (DRI) development order or review if the master plan is incorporated into the local government comprehensive plan.

Before the planning agency makes any recommendations to the governing body concerning the plan or plan amendments, it should hold at least one public hearing, with prior public notice, on the proposed plan or plan amendment. Open forums in which "affected persons" of a publicly financed capital improvement project may voice concerns should be an integral part of the planning process.

Florida Statutes, Title XIII Chapter 186, *State and Regional Planning*
State of Florida
Published: 2009
Retrieved From: http://www.dca.state.fl.us/fdcp/dcp/publications/statutesruleslegisl

Abstract

The statute outlines preparation, implementation, and elements of the State Comprehensive Plan and the Strategic Regional Policy Plans. A State Comprehensive Plan is required to provide policy direction for all state and regional agencies and local governments. The purpose is to preserve and enhance the quality of life of the people of the state.

It states that the Executive Office of the Governor should prepare a proposed State Comprehensive Plan, which provides long-range guidance for the orderly social, economic and physical growth of the state. The Executive Office of the Governor should emphasize management of land use, water resources and transportation systems when developing growth management goals, objectives and policies.

The "growth management" portion of the State Comprehensive Plan should be strategic in nature and should provide guidelines for state transportation corridors, public transportation corridors, new interchanges on limited access facilities, and new airports of regional or state significance. The revision of the State Comprehensive Plan is to be a continuous process. Each section will be reviewed and analyzed biennially by the Executive Office of the Governor, in conjunction with the planning officers of other state agencies significantly affected by the provisions of the particular section under review.

The strategic regional policy plan portion of the statute provides for the creation of regional planning agencies to assist local governments in resolving their common problems in specific regions. It states that this is important because the problems of growth and development often transcend the boundaries of individual units of local general-purpose government. In addition, it is difficult for a local government to formulate plans or implement policies for their solution without affecting other units in their geographic area.

The powers and responsibilities of the regional planning council include acting in an advisory capacity to the constituent local governments in regional, metropolitan, county and municipal planning matters. The council is also to review plans of independent transportation authorities and metropolitan planning organizations and identify inconsistencies between those agencies' plans and applicable local government plans.

The elements of the strategic regional policy plans include regional policies and goals that address affordable housing, economic development, emergency preparedness, natural resources of regional significance, and regional transportation. As far as transportation is concerned, the plan will identify investment strategies for providing transportation infrastructure where growth is desired. The plan will also identify and address significant regional resources and facilities while being consistent with the State Comprehensive Plan. Once the Plan has been formulated, each regional planning council will submit to the Executive Office of the Governor its proposed strategic regional policy plan. The Executive Office will then review the Plan and recommend revisions. However, these are purely recommendations and nothing precludes the regional planning council from adopting or rejecting any or all of the revisions prior to the effective date of the Plan.

Each regional planning council must prepare an evaluation and appraisal report on its strategic regional policy plan at least once every five years. This may include addressing changes in the State Comprehensive Plan and the successes and failures of the Plan.

Florida Statutes, Title XXV Chapter 330*, Regulation of Aircraft, Pilots, and Airports*
State of Florida
Published: 2005
Retrieved From: http://www.dca.state.fl.us/fdcp/dcp/publications/statutesruleslegis/.htm

Abstract

This statute provides for the licensing jurisdiction of the Florida Department of Transportation (FDOT) as it pertains to the regulation of aircraft, pilots, and airports.

It states that the owner or lessee of any proposed airport must obtain approval of the airport site from FDOT prior to the acquisition of the site or prior to the construction or establishment of the proposed airport. The site will be granted a two-year approval by FDOT if:

- It meets the standards of safety and will comply with applicable county or municipal zoning requirements
- All nearby airports, municipalities, and property owners have been notified and any comments submitted by them have been given adequate consideration
- Safe air-traffic patterns can be worked out for the proposed airport and for all existing airports and approved airport sites in its vicinity

The owner or lessee of an airport in this state must obtain a license prior to the Operations of aircraft on the airport. The FDOT is authorized to license an airport that does not meet all of the minimum standards only if it determines such exception is justified and such a license shall bear a "special" designation. A "temporary" designation may be issued for any publicly or privately owned airport that will be used for a period less than 90 days with no more than 10 operations per day. This non-renewable designation shall expire no later than 90 days after the issuance. Each public airport license will expire no later than one year after the effective date of the license. The license period for all airports other than public airports will be set by the department, but shall not exceed a period of five years.

Among those airports exempt from these provisions, are those owned and operated by the United States or those that are under the jurisdiction or control of a county or municipal aviation authority or a county or municipal port authority. The statute also provides that no county or municipality of this state shall license airports or control their location except by zoning requirements. The statute outlines airport zoning and approach zone protection provisions. It is stated that airports licensed for general public use are eligible for approach zone protection and the procedure will be that outlined in Chapter 333 of the Florida State Statutes.

Recently, an act was passed by the Florida Legislature, which amends this Statute. The purpose of the amendment is to prohibit the Florida Department of Transportation from renewing or reissuing licenses to general aviation airports that fail to develop a security plan.

It states that an airport license may be revoked should an airport that is required to file or update a security plan fail to do so. An update of the security plan shall occur every two years. In addition, any security plan that is filed should be consistent with the Florida Airports Council's guidelines for security planning at general aviation airports.

Florida Statutes, Title XXV Chapter 331 Part 1*, Airport and Air Commerce*
State of Florida
Published: 2005
Retrieved From: http://www.dca.state.fl.us/fdcp/dcp/publicatoins/statutesruleslegis/.htm

Abstract

This statute provides guidance as to air commerce and its effects on airports in this state. It states that those engaged in the transportation of mail, freight, express, and passengers by aircraft between fixed termini and on fixed schedules are delegated the authority to exercise the right to appropriate property, except state and federal, for the purpose of securing land for airport, air terminals, seaplane bases and landing fields in the state.

As this statute pertains to auto transportation between county airports, it states that the board of county commissioners of every county owning or operating an airport shall have the right, power, and authority to enter into contracts with motor carries for the transportation of passengers between the airport or airports and points within the specific county. The statute also provides for the county commissioners to have the rights to publicize, advertise, and promote the activities of its airport as well as make known the advantages, facilities, resources, products, attractions, and attributes of its airport.

The statutes go on to explain that information that pertains to airport security is exempt from certain disclosure requirements of public facilities. Photographs, maps, blueprints, drawings, and similar materials that depict critical airport operating facilities are among those items exempt from such provisions.

Florida Statutes, Title XXV Chapter 332, *Airports and Other Air Navigation Facilities*
State of Florida
Published: 2005
Retrieved From: http://www.dca.state.fl.us/fdcp/dcp/publications/statutesruleslegis/.htm

Abstract

The statute gives Florida Department of Transportation (FDOT) the power to administer airports, establish transportation corridors, and assume the duties and responsibilities of the Secure Airports for Florida's Economy Council (SAFE Council). FDOT has the authority to plan the airport system in the state of Florida. Additionally, the department is to promote the further development and improvement of air routes, airport facilities, and landing fields; protect landing field approaches; and stimulate the development of aviation commerce and air facilities. However, FDOT cannot regulate commercial air carriers operating within the state under Federal authority and regulations, nor can it participate in or exercise control of the management and operation of a sponsor's airport, except when officially requested.

FDOT must periodically update the aviation system plan and summarize a five, 10, and 20-year airport and aviation needs outlook within the state. Other specific duties that the department is responsible for consist of:

- Advising the Governor in all aviation matters
- Assisting airport sponsors, financially and technically, in airport master planning activities
- Participate in research and development programs relating to airports
- Administer aviation and airport grants
- Distribute supporting information and educational services
- Encourage the maximum allocation of federal funds to local airport projects
- Support the development of land located within the boundaries of airports for the purpose of industrial or other compatible uses that will assist the airport in becoming fiscally self-supporting.

The FDOT's financial support of state airports gives priority to projects for runways and taxiways, including their painting marking and lighting, and other related airside activities. Airport access projects on airport property also receive high priority.

Department policy dictates that no single airport is to secure state funds in excess of 25-percent of the total airport or aviation development project funds. If an airport receives discretionary capacity-improvement project funds in a given fiscal year, it cannot receive greater than 10-percent of the total statewide aviation or airport funds available. An overview of funding levels as they pertain to each type of project is provided.

The statute also includes provisions for municipalities acquiring property, for the purpose of establishing or enlarging airports. They may not acquire or take over an airport owned or controlled by any other municipality without the consent of that municipality. The municipality may lease, for a term not exceeding 30 years, airports or real property acquired for airport purposes to private parties. They may also accept Federal and other funds for the acquisition, construction, enlargement, improvement, maintenance, equipment, or operation of airports and other air navigation facilities.

The "Secure Airports for Florida's Economy Act" is outlined. It provides for a council of 27 members that is to create a five-year master plan for the development of airport facilities and

an intermodal transportation system consistent with the goals of the Florida Transportation Plan. Among other duties, the council is to recommend the acquisition and construction of transportation facilities or airport facilities for the purpose of protecting the safety and security of passengers and cargo, enhancing international trade, promoting cargo flow, increasing enplanements, increasing airport revenues, and providing economic benefits to the state.

Florida Statutes, Title XXV Chapter 333, Airport Zoning
State of Florida
Published: 2005
Retrieved From: http://www.dca.state.fl.us/fdcp/dcp/publications/statutesruleslegis/.htm

Abstract

This statute outlines airport-zoning requirements, procedures for the adoption of zoning regulations, and the review and enforcement of the regulations. Because hazards to airport operations endanger the lives and property of the users of the airport and of the occupants of land in its vicinity, mitigation of these hazards must be undertaken. Each person is to secure from the Florida Department of Transportation (FDOT), a permit for the erection, alteration, or modification of any structure within the airport hazard area. A permit is also required if the proposed construction is within a 10-nautical-mile radius of the geographic center of the airport that would result in exceeding Federal obstruction standards as contained in 14 Code of Federal Aviation Regulations Part 77. Airports affected by this will be those having facilities shown on an airport master plan or an airport layout plan approved by the Federal Aviation Administration (FAA).

A political subdivision having an airport hazard area within its territorial limits has the power to adopt, administer, and enforce airport-zoning regulations. If the airport or airport hazard area is contained in more than one political subdivision, airport-zoning regulations may be adopted through inter-local agreement or by ordinance or duly adopted resolution. The regulations will restrict incompatible uses, activities, or construction within runway clear zones and prohibit the construction of an educational facility of a public or private school at either end of a runway within an area extending five miles along the centerline of the runway and a width of one-half the length of the runway. However, exceptions to this rule are provided. If a conflict should occur between the local airport zoning regulations and any Federal regulations, the more stringent of the two is to be enforced. The statute also provides for hearings and the possible creation of an airport zoning commission prior to the adoption of any airport zoning areas.

All zoning regulations are to be "reasonable" in nature and any regulations adopted under this chapter would require the removal, lowering, or other change or alteration of any structure or tree not conforming to the regulations. The authorized entity responsible for the operation of the airport, when submitting a "finding of no significant impact", an environmental assessment, a site-selection study, an airport master plan, or any amendment to an airport master plan, must simultaneously submit a copy to all affected local governments. These affected governments are outlined in the document.

Procedures for the granting of building permits and their effect on airport hazard areas are also outlined. Should a permit be denied, a person might apply to an established local "board of adjustments" for a variance from the zoning regulations in question. Provisions for the judicial review of any "board of adjustment" decisions are also given. Should a permit be granted under a variance of the regulations, it should require that the owner of the structure or tree in question install, operate, and maintain, at his/her own expense, such marking and lighting that may be necessary to indicate to aircraft pilots the presence of the obstruction.

Florida Statutes, Title XXVI Chapter 339*, Transportation and Finance Planning*
State of Florida
Published: 2009
Retrieved From:
http://www.leg.state.fl.us/STATUTES/index.cfm?App_mode=Display_Statute&URL=Ch0339/titl0339.htm&StatuteYear=2009&Title=%2D%3E2009%2D%3EChapter%20339

Abstract

The statute outlines the different expenditures, state trust fund regulations, local planning organizations, and various state assistance and incentive programs for transportation planning and funding. The State Transportation Trust Fund can be used for many state projects, and the statute outlines some of the requirements that need to be met in order to receive funding. It states that a certain percentage of funds are to be expended with certified disadvantaged business enterprises, construction-management development programs, and bond guarantee programs.

It states that the Transportation Revenue Bond Trust Fund is for the deposit of funds received by FDOT from the proceeds of revenue bonds secured by state and Federal revenues and credited to the trust fund. The net proceeds from revenue bonds issued for eligible transportation projects should be credited to the trust fund to provide for payment of eligible costs. Another trust fund that is accessible for transportation and finance planning is the Federal Law Enforcement Trust Fund. Much like the previous trust fund, this fund is administered by the Department of Transportation. The statute states that the use of transportation tax revenues received can be used for transportation purposes only, but can include noise mitigation facilities or walls upon request of the proper authorities.

The statute discusses the legislative budget request and the definitions, preparation, adoption, execution and amendment of the process for this task to be completed. An important part of this process is the nature and scope of the tentative and adopted work programs vying for transportation funds. The statute identifies different funding sources for a tentative work program as well as the development of the program.

Metropolitan Planning Organizations (MPO) play a vital role in the transportation planning and funding of projects. These organizations are part of a regional network of planning for the state. The MPO is authorized to manage a continuing, cooperative, and comprehensive transportation planning process that is based upon principles provided in another statute.

The statute identifies specific assistance and transportation programs, including the Florida Strategic Intermodal System (SIS). The only program in this statute that involves the aviation industry is the SIS. This system is created to provide solutions for the demand of travel to and from the state's growing regional and intercity economic centers.

Florida Statutes, Title XXVI Chapter 341.053, *Intermodal Development Program; Administration; Eligible Projects; Limitations*
State of Florida
Published: 2005
Retrieved From: http://www.dot.state.fl.us/publictransportation/policylegis.htm

Abstract

The Intermodal Development Program's guidelines are outlined in this document. The program has been created within the Florida Department of Transportation (FDOT) to provide for capital investments in the intermodal or multimodal movement of people and goods. The program's development plan should:

- Define and assess the state's freight intermodal network, including airports, seaports, rail terminals, and connecting highways
- Prioritize statewide infrastructure investments, including the acceleration of current projects
- Be developed in a manner that will assure maximum use of existing facilities and optimum integration and coordination of the various modes of transportation.

FDOT is authorized to fund projects within the Intermodal Development Program, which are consistent, to the maximum extent feasible, with approved local government comprehensive plans for the units of local government in which the project is located.

Florida Statutes, Title XXVIII, Chapter 380, *Land and Water Management*
State of Florida
Published: 2005
Retrieved From: http://www.dca.state.fl.us/fdcp/dcp/publications/statutesruleslegisl

Abstract

In order to facilitate orderly and well-planned development that protects the natural resources and environment of the state, Chapter 380 of the Florida Statutes has been developed. Outlined in the statute are areas of critical state concern, Developments of Regional Impact (DRI), the Florida Quality Developments program, coastal planning and management, and the Florida Communities Trust.

Areas of critical state concern are those designated as containing or having significant impact upon environmental or natural resources of regional or statewide importance. These are determined by the state land planning agency and recommended to the Administration Commission for final approval. Once designation is determined, the local government must submit to the state land planning agency its existing land development regulations and local comprehensive plans for review. The agency will determine if the local plans are consistent with the guidelines for developing an area of critical state concern. No development may be undertaken in these areas without following the provisions of this statute.

Developments of Regional Impact (DRI) pertain to any development that, because of its character, magnitude, or location, would have a substantial effect upon the health, safety, or welfare of citizens of more than one county. Guidelines are given to determine if a development should undergo a DRI review. Thresholds against which these guidelines are measured are presented. A development that is below 100-percent of all the numerical thresholds shall not be required to undergo a DRI review. A development that is at or above 120-percent of any numerical threshold would be required to undergo a review. It is presumed that those developments between 100-percent and 120-percent of any of the thresholds would be subject to the review. However, these will be reviewed on a case-by-case basis by the state land planning agency.

Airport actions that would be required to undergo a DRI review are:

- A new commercial service or general aviation airport with paved runways
- A new commercial service or general aviation paved runway
- New passenger terminal facilities
- The lengthening of a runway by 25-percent at a commercial service or general aviation airport
- A development that results in an increase in the number of gates by 25-percent or three gates, whichever is greater, at a commercial service or general aviation airport. However, expansion of existing terminal facilities at a non-hub or small hub commercial service airport would not be subject to a DRI.

There are also provisions providing for the alteration of facilities originally selected to undergo a DRI review. Those airports adding a new runway, new terminal facility, lengthening an existing runway by 25-percent, or a 25-percent increase in the number of existing terminal gates must be considered a substantial deviation. This would cause the development to be subject to further DRI review.

In order to encourage development that has been thoughtfully planned to take into consideration protection of Florida's natural amenities, the Florida Quality Developments program

has been established. This program provides for the developer to be provided an expeditious and timely review by all agencies with jurisdiction over the project of his or her proposed development. Developments are to be chosen if they would be above 80-percent of any numerical thresholds in the guidelines and standards for DRI review.

The Coastal Planning and Management Plan provides guidance for planning and developing coordinated projects for coastal resource protection. The coastal zones, which fall under these provisions, consist of the 35 coastal counties of Florida.

The Florida Communities Trust is meant to undertake, coordinate, or fund activities and projects, which will help bring local comprehensive plans into compliance. Among other goals, the Trust is used to restore areas that are adversely affected by scattered ownership, poor layout, inadequate park and open space, and incompatible land uses. These goals are financially supported through grants and loans via the Trust. The Trust operates with local governments, state agencies, Federal agencies, and nonprofit organizations to ensure these goals are met.

Florida Administrative Code Rule 9J·2, *Rules of Procedure and Practice Pertaining to Developments of Regional Impact*
State of Florida
Published: 2005
Retrieved From: http://www.dca.state.fl.us/fdcp/dcp/publications/statutesruleslegisl

Abstract

Rule Chapter: 9J-2 pertains to the procedures and practices that are to be followed when dealing with Developments of Regional Impact (DRI). Should the development be at or above any of the numerical thresholds for a DRI review, the developer may file an application for a "Binding Letter of Interpretation". This may be requested by a developer in order to clarify in a short period whether or not the development should undergo a DRI review. The division will issue such a letter upon its conclusion. Once it is determined that a development will be required to undergo a DRI review, it cannot move forward without a DRI development order unless a "Preliminary Development Agreement" (PDA) has been issued. The PDA may allow development on all or portions of the land proposed for development. This is contingent on the development not having adverse affects on the original reason for a DRI review. Should a DRI review likely be required, there are specified procedures to be followed by both the developer and all planning agencies involved.

A pre-application conference is suggested in order for the local planning agency, the regional planning agency, the state planning agency, and the developer to meet and outline the steps required before the project may move forward. The developer should bring to the meeting as much information as possible that is pertinent to the development. In fact, the developer should submit, to all conference participants, the information required by Form RPMBSP-PREAPP INFO-1, ten working days before the scheduled conference. Both sides may use the conference as a forum to ask questions and clarify the overall process.

After the conference, an application for development approval with the local government having jurisdiction should be filed. If the development is to occur over an extended period, master development approval can be sought. Upon review of the development, the regional planning agency will submit a report and recommendations to the local government.

The local government is responsible for issuing the final development order. The contents of this order include requirements that the developer follow recommendations made by the regional planning agency, the monitoring procedures to be administered by the local official responsible for assuring the development's compliance with the development order, and a deadline for commencing physical development and for compliance with conditions of approval or phasing requirements.

Florida Administrative Code Rule 9J·5, *Minimum Criteria for Review of Local Government Comprehensive Plans and Plan Amendments, Evaluation and Appraisal Reports, Land Development Regulations and Determining of Compliance*
State of Florida
Published: 2005
Retrieved From: http://www.dca.state.fl.us/fdcp/dcp/publicationslstatutesruleslegisl

Abstract

A minimum criterion for comprehensive plans and plan amendments is established under this rule in order for local government comprehensive plans to be consistent with the appropriate strategic regional policy plan and the State Comprehensive Plan. Public participation and general requirements are outlined, as well as all elements that should be included in a local government comprehensive plan.

One element to be included in the comprehensive plan is the future land-use element. This is the designation of future land-use patterns as depicted on a future land-use map or map series. In addition, to be included is a capital improvements element. This element should evaluate the need for public facility improvements to include an estimate of the cost of improvements for which the local government has fiscal responsibility. This element should support the future land-use element and include transportation facilities including any aviation facilities. In evaluating local capital improvement projects, criteria should be established to evaluate each project. This criterion considers: the elimination of public hazards; the elimination of existing capacity deficits; local budget impact; location needs based on projected growth patterns; the accommodation of new development and redevelopment facility demands; financial feasibility; and plans of state agencies and water management districts that provide public facilities within the local government's jurisdiction.

Formerly, a section comprising ports, aviation, and related facilities was a separate element of comprehensive plans, but this element requirement has been repealed and incorporated into a broader transportation element. Aviation and related facilities should be a part of this element, except for plans for areas with a population of 50,000 or less. This element should include a map or map series that incorporates, among other things, airport facilities, their clear zones, and associated obstructions. The element should also consist of an analysis section that includes an analysis of land-use compatibility around airports, an analysis of existing and projected intermodal deficiencies and needs, and an analysis that demonstrates the integration and coordination among the various modes of transportation, including airport facilities. The goals and objectives of the local transportation system should also be addressed. This should include:

- The coordination of siting new airports or expansion of existing airports with the future land use, coastal management, and conservation elements
- The coordination of surface transportation access to airports with the traffic circulation system shown on the traffic circulation maps, to ensure that access routes to airports are properly integrated with other modes of surface or water transportation and to coordinate with airport facility plans, FAA plans, and the Continuing Florida Aviation System Planning Process (CFASPP).

For each of these objectives, policies should be put into place that address implementation activities to achieve the goals and objectives of the comprehensive plan.

Florida Administrative Code Rule 9J·11, *Governing the Procedure for the Submittal and Review of Local Government Comprehensive Plans and Amendments*
State of Florida
Published: 2005
Retrieved From: http://www.dca.state.fl.us/fdcp/dcp/publications/statutesruleslegisl

Abstract

The intent of this rule chapter is to provide rules and procedures for the submittal and review of local government comprehensive plans, plan amendments, land development regulations, and evaluation and appraisal reports. The submittal requirements detail the elements of the plan and plan amendments that are required, as well as a list of agencies that should receive copies of the plan. Should amendments be required for the plan, the data and analysis requirements for such amendments is outlined and for more specific requirements, are referenced to Rule Chapter 9J-5.

A timeline for the Florida Department of Community Affairs Division of Community Planning review process is given. It includes procedures for holding public hearings as well as public notification of such hearings. The hearings are intended for affected persons to provide input to the Division of Community Planning and the local government on elements of a comprehensive plan and plan amendments.

Sixty calendar days after receipt of all documents by the Division, the Director of the Division of Community Planning, or a designee, will send the local government the Division's objections, recommendations, and comments report to the local governing body. The mediation process is then provided for the local government to work out any differences with the Division as far as its recommendations are concerned.

After this process is complete and all applicable public hearings have been held, the local government is to resubmit the amended document to the Division, and the Division will issue a Notice of Intent to find the plan in compliance or not in compliance. Any petitions or objections to the final document will be filed and additional hearings held.

The adoption of a Comprehensive Plan Compliance Agreement Amendment by the local government is outlined as well as its submittal requirements. The success or failure of the local government's comprehensive plan is later evaluated via an evaluation and appraisal report submitted by the local planning agency to the local government. Should the report recommend changes, amendments to the plan can then be submitted to the Division of Community Planning and, if approved, later adopted by the local government.

Any land development regulations that may result from the comprehensive plan may later be required to be submitted to the Division of Community Planning, if the Division has grounds to believe that the local government has completely failed to adopt one or more of the regulations required by Section 163.3202 of the Florida Statutes. The local government may be subject to civil court action should the appropriate regulations not be adopted after it is determined by the Division that the local government has failed to adopt such regulations.

Florida Administrative Code Rule 14·60, *Airport Licensing, Registration, and Airspace Protection*
State of Florida
Published: 2004
Retrieved From: http://www.dot.stateJl.us/aviationIFLPub.htm

Abstract

This chapter provides standards for airports, airport markings, and airport lighting as well as airspace protection as they apply to the licensing of Florida airports. The requirements for airport site approval are given as well as the procedures for issuance of an airport site approval order. An airport owner or lessee of any airport in the State of Florida must have either an airport license or airport registration prior to the operation of any aircraft at the site. The application process to obtain a license or registration is outlined as well as conditions that would warrant a revocation of a license or registration.

The airfield standards that are given include dimensions for minimum landing areas, primary surfaces, approach surfaces, transition surfaces, and runway safety areas. Also given are the situations that would warrant a displaced threshold on a runway. Pavement standards, as well as the measuring index used to evaluate runway pavement condition, are given in order to ensure a safe runway environment for aircraft. All markings and lights that are required by the State of Florida are also listed. The Chapter provides for airspace protection standards and the procedures for any proposed construction that could possibly exceed Federal obstruction standards. In addition, any proposed construction site within a ten-mile radius of the geographical center of a publicly owned or operated airport is required to obtain an airport obstruction permit. Should obstructions be constructed, obstruction marking and lighting standards are given. Should these standards not be followed prudently, revocation of an airport's license and/or registration can occur.

Florida Administrative Code Rule 28-24, *Land Planning Part II - Developments Presumed to be of Regional Impact*
State of Florida
Published: 2005
Retrieved From: http://www.dca.state.fl.us/fdcp/dcp/publications/statutesruleslegisl

Abstract

The thresholds that are to be used as guidelines for a developer to determine whether a development should be considered a Development of Regional Impact (DRI) are given. Some of the airport projects that are to be presumed to be a DRI are a new commercial service or general aviation airport with paved runways, a new commercial service or general aviation paved runway, or a new passenger terminal facility. Additionally, an expansion of an existing runway or terminal facility by 25-percent or 50,000 square feet, whichever is greater, on a commercial service or general aviation airport with regularly scheduled flights, shall be presumed to be a DRI.

A development that is at or below 80-percent of these numerical thresholds shall not be required to undergo a DRI review. A development that is between 80 and 100-percent of these thresholds will not require a DRI review. A development that is at 100-percent, but below 120-percent of the thresholds shall be presumed to require a DRI review. Finally, a development at or above 120-percent of the thresholds shall be required to undergo a DRI review. However, an expansion of existing terminal facilities at a non-hub or small hub commercial service airport shall not be presumed to be a DRI.

As far as runway expansion is concerned, the strengthening of a runway, when the strengthening will result in an increase in aircraft size or the addition of jet aircraft utilizing the airport, shall be considered a DRI. However, any airport development project proposed for safety, repair, or maintenance reasons alone would not be presumed to be a DRI.

FDOT Topic No. 725-040-040-h, *Aviation Program Management*
State of Florida Department of Transportation
Published: 2009
Retrieved From: http://www.dot.state.fl.us/planning/sis

Abstract

Aviation Program Management provides policy guidance and prescribes a process and standards for planning, approving, and monitoring FDOT funding commitments to individual airport projects that will encourage statewide program consistency and effective spending on FDOT aviation priorities. The document outlines policy regarding development of long-range needs estimates, compliance with Florida Statutes and a realistic and stable five-year work program.

This policy document describes project state funding eligibility in which the airport must be publicly owned and open for public use. To be eligible for FDOT funding, the airport and its role must be explicitly cited in the current FASP. The state of Florida has adopted policies to guide future development of the Florida system of airports and aviation facilities that state the facilities should target state aviation investments; expand the state's busiest airports; expand automobile; truck and transit access; protect airports from encroaching development; respond to security requirements; support emerging technologies; and adapt to an older population.

To be eligible for FDOT funding, the airport master plan and Airport Layout Plan must be FDOT-approved. Eligible items for FDOT funding include some capital projects that are identified in the master plan. District offices may fund the federal share of multi-year projects via grant or loan. All projects must be identified in the Joint Automated Capital Improvement Plan (JACIP) database to be eligible for funding.

The guidance provides the FDOT project priorities. These priorities are addressed as federally funded projects, projects that will not attract federal funding and economic development projects. The two methods of funding are grants and loans. There are different levels of grant funding. District offices may fund up to 80-percent of the non-federal share of project costs at general aviation airports when federal funds are available. If federal funds are not available, district offices may fund up to 80-percent of the total cost of projects at those airports, except airport economic development projects. At commercial service airports, district offices may fund up to 50-percent of the cost of the project if federal funds are not available.

The procedure provides guidance for aviation sub-programs, such as the Airport Improvement Program (AIP) and the Discretionary Capacity Improvement Program, both of which are federally funded programs. Financial planning and project management are discussed in the guidance, which provides strategies for cost estimates and production schedules. Finally, the guidance has project record, archival and quality assurance and control recommendations.

FDOT Topic No. 725-040-055-b*, Loans to Airports*
State of Florida Department of Transportation
Published: 2007
Retrieved From: http://www.dot.state.fl.us/planning/sis

Abstract

Loans to Airports provides guidance and a process for the administration of loans to airports and collection of the related receivables. This process is required for all projects where state funds are loaned to an airport. Such projects should be planned and managed in compliance with FDOT *Procedure No. 725-040-040, Funding Airport Projects*. It is important to remember that loans are administered and managed in the same manner as aviation grant funds. District FDOT aviation offices are responsible for maintaining project agreements, files and financial records for all airport loans in their respective districts.

The district office will maintain a loan reimbursement schedule for all outstanding loans, unless the Joint Participation Agreement (JPA) is for a general aviation airport and 1) the FAA matching funds are unlikely to be received by the airport, "AND" OR "OR"? 2) the JPA contains a contingency provision that provides for the automatic application of project shares if the FAA funds are not received. The schedule must be updated quarterly and no later than 15 days after the end of each quarter. The procedure discusses additional requirements that the district office requires the sponsor to complete while managing the JPA.

Loan repayments are due and payable as provided in the JPA. FDOT district aviation offices will monitor the loan repayment schedule. The procedure outlines the collection and enforcement process when a scheduled payment is not received by FDOT. There are guidelines for accounts receivable write-offs and the appropriate decision makers are identified. Finally, there is a special provision that discusses the procedure for loans to purchase land.

FDOT Topic No. 725-040-060-d, *Airport Economic Development Program*
State of Florida Department of Transportation
Published: 2007
Retrieved From: http://www.dot.state.fl.us/planning/sis

Abstract

Airport Economic Development Program provides a process and guidance for administering airport economic development projects. The objective of the airport economic development program is to encourage development on airport property that will promote that airport's financial self-sufficiency.

District public transportation managers should solicit airport economic development project applications from airport sponsors on an annual basis. Only publicly owned general aviation airports that are open for public use qualify for state funding from this program. The project proposals that are received are prioritized and ranked, based on the needs of the airport, merit of the project, and ability of the airport to fund the project. A financial analysis must be provided by the airport sponsor that demonstrates the revenue-producing potential of the project. As a general requirement, airports must disclose to FDOT the source(s) of all economic development project funds prior to the execution of and Joint Participation Agreement (JPA) for these projects. This program is a 50/50 state and local matching grant program.

FDOT Topic No. 725-040-100-f, *Airport Master Plans*
State of Florida Department of Transportation
Published: 2008
Retrieved From: http://www.dot.state.fl.us/planning/sis

Abstract

Airport Master Plans guides the Florida Department of Transportation (FDOT) participation in the preparation, funding, review and approval of airport master plans prepared by local airport sponsors. An airport master plan is an organized collection of information and analyses, and the resulting decisions and policies guiding the future development of an airport over a specified period, usually 20 years. Florida's philosophy on airport master planning is to encourage effective airport planning while reducing costs by focusing on computer-based rather than paper-based airport master plan information and only updating the information when needed.

The Capital Improvement Program (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 (FASP). Airport master plans may include elements that are inconsistent with the local government comprehensive plan. Airport master plans submitted to FDOT that include projects in the CIP that are inconsistent with local government comprehensive plan should adequately address the issue in the narrative or the airport master plan will not be approved.

Cities and counties should 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. Airports may elect to incorporate the airport master plan into their local government's comprehensive plan. Development projects included in an FAA-approved master plan and incorporated into a local government comprehensive plan will not be subject to a Development of Regional Impact (DRI) review.

The airport master planning process begins with project justification and a scope meeting with the FDOT and FAA, if applicable. In this meeting, the district office will review the airport's role in the Florida Aviation System Plan (FASP), which should lead to a preliminary scope of work. The next step is to receive funding from FDOT, which will include a statement of project needs, proposed scope of work, project schedule, cost estimates and requested fund sources. The district will monitor the project performance, review and approve or request corrections to project products. FDOT will process project invoices based on approval of project deliverables and conduct a final project review. Final project approvals and implementation of the master plan product are the last steps in the master plan procedures outlines in this guideline.

FDOT Topic No. 725-040-210-d*, New Public Airport Funding Eligibility*
State of Florida Department of Transportation
Published: 2009
Retrieved From: http://www.dot.state.fl.us/planning/sis

Abstract

New Public Airport Funding Eligibility documents a procedure for evaluating proposals for adding new publicly owned, publicly operated airports to the roster of Florida transportation systems eligible for capital funding under Chapter 332, Florida Statutes. The airport must be adopted into the FASP for state and federal funding for airport development in Florida. The FDOT district office should review the proposal from the prospective sponsor. This should identify how the airport will accomplish the local, regional and community goals and objectives for the airport. If the local government goals and objectives are positive and the FDOT district office concurs, then the process begins.

There are eight steps to building a new airport in the state of Florida. Identifying a willing airport sponsor is the first step in the process. The second step is to conduct a feasibility study. This study must demonstrate a need for a new airport and that there is sufficient land and airspace for the proposed airport. The feasibility study, at a minimum, has the following required elements: purpose, existing regional system, aviation demand, system wide demand/capacity analysis and facility requirements, preliminary identification of alternative potential airport site areas, impacts on surface transportation, financial feasibility, and airport feasibility recommendations.

Once the feasibility study has come back with a positive recommendation, the next step can begin. This step initiates the process of the airport being placed in the FASP and NPIAS. The airport site selections and preliminary environmental planning is the next step. This step may require several environmental studies prior to facility design and construction. The FDOT Aviation Office must approve the proposed new airport site prior to capital funding. Facility planning comes next and includes developing an airport master plan and airport layout plan. These planning documents will help provide a financial component and prioritized capital project list for the airport. Local government planning is the next step. It provides information from the MPO and Florida Department of Community Affairs (DCA) and allows the master plan to be adopted into the local comprehensive plan, if desired. The last two steps are the environmental impact analysis and airport construction. The environmental impact analysis is conducted and the FAA must issue a record of decision (ROD), before construction can begin. Once the ROD is completed to federal, state and local satisfaction, construction can begin on the new airport.

Florida's Strategic Intermodal System Plan
State of Florida Department of Transportation
Published: 2005
Retrieved From: http://www.dot.state.fl.us/planning/sis

Abstract

Florida Strategic Intermodal System (SIS) was established in 2003 as a way to focus the limited financial resources of the Florida Department of Transportation (FDOT) on transportation facilities that are critical to Florida's economy and quality of life. In order to organize efforts and implement the system in the most efficient manner, the SIS Plan has been developed to provide a direction for planning and managing Florida's transportation systems.

Long-term projections estimate that an additional 5.8 million residents will occupy the state by 2020. In order to provide a feasible transportation infrastructure for this growing population and accommodate the State's extensive tourist base, an intermodal approach to improve connectivity among individual modes is addressed. The SIS plan emphasizes elimination of bottlenecks and unnecessary delay, improving travel time reliability and expanding the options available for interregional travel.

As diversification of the State's economy becomes a priority, the SIS Plan also outlines support for interregional, interstate, and international transportation services that support such diversification. This support comes by way of reduction in transportation and logistics costs, improving access to markets for urban and rural areas, and supporting growth in trade and tourist flows. Additionally, the Plan indicates changes in policy as it attempts to take a proactive approach toward transportation planning. Whereas traditionally infrastructure was built to mitigate or provide a short-term solution to local problems, the SIS Plan will build infrastructure that is financially feasible and can provide capacity for years to come.

The SIS Plan provides for specific designation of SIS facilities. It notes that the facilities are to be broken down into hubs, corridors, and intermodal connectors. These facilities will qualify as SIS facilities by achieving certain thresholds of people and goods movement. The criteria to determine the thresholds that these facilities must achieve will be updated every five years, along with an annual review of activity levels on all facilities and a process for responding to partner requests in the interim.

The Plan also indicates the method to be used to determine the needs of SIS facilities around the State. The SIS will develop a "Needs Plan" in order to identify what infrastructure would best serve the transportation needs of the future. This plan will identify the optimal combination of capacity and operational investments across different modes and facilities. Due to the limited funding FDOT has for SIS facilities, the "Needs Plan" must be broken down into priorities. A prioritization process will culminate in a "SIS Cost Feasible Plan." This will estimate costs and balance them with reasonable estimates of future funding for the SIS for FDOT and its partners. The projects will then be selected to be a part of the FDOT five-year work program that is required by State law. Through this work program process, projects will be selected based on:

- The extent to which they meet the goals and objectives of the SIS
- The "readiness" of the project as far as planning is concerned
- The project's cost
- How the project balances quick fix and longer term capacity investments
- Whether the project would help assure reasonable distribution of investments among economic regions of the State

- Whether public benefits exceed public investment when the facility is owned by the private sector.

FDOT plans to provide financing for these projects through a significant investment policy. This policy specifies that:

- 75-percent of discretionary capacity funds will go toward SIS and emerging SIS facilities
- A reasonable distribution should occur between SIS, Emerging SIS and economic regions
- An increased emphasis should be placed on regional travel and transport
- The State should continue its commitment to the safety and preservation of Florida's transportation system and its current support for non-highway modes.

This policy likely will lead to a dedication of $2 billion annually for the SIS and Emerging SIS projects. The SIS will expand the capacity of interregional corridors that link rural areas to hubs in other regions. It will also help growing regions by providing better highway and rail access to local airports, seaports, and other terminals in order to aid in the facilities' ability to reach their full potential. Finally, urban areas will benefit from increased linkage to other urban areas, other states, and other countries. Full implementation will take place in the next few years with work by the FDOT and help from its partners.

Florida Aviation System Plan
State of Florida Department of Transportation
Published: 2005
Retrieved From: http://ww.dot.state.fl.us/aviation/FLPub.htm

Abstract

Airports will likely have the impact on the 21st century transportation that highways had on the 20th century, railroads had on the 19th century, and seaports had on the 18th century. The State of Florida has developed the Continuing Florida Aviation System Planning Process (CFASPP) in order to ready itself for the future.

An overview of this plan and the variables that affect it are contained in this document. The plan is an outlook to the year 2025 and gives a rundown of policies and possible changes to these policies as external variables may warrant.

A socio-economic evaluation of the state is given in order to show population growth and its effects on aviation and vice-versa. The data show that the state's population more than doubled between 1970 and 2000 and that it is expected to double again by 2025. The senior citizen age group will make up 26 percent of the population, up from about 18 percent of the population. Studies show an influx of retirees generally prompts additional population growth due to the demand for goods and services those retirees require. This is labeled "urbanization" throughout the document and serves as a basis from which to predict economic growth in certain regions, which must be accompanied by aviation capacity.

Airports are business- and job-creation engines themselves, because availability of air service reduces costs, saves travel time, and expedites marketing and product delivery. The 19 primary, 25 reliever, and 83 community public-use airports in the state of Florida are part of this economic engine. They serve Florida's most important industries, tourism and international trade.

About half of all Florida visitors arrive by air, showing the importance of the air service infrastructure to the tourism industry. This activity is concentrated mainly in the Miami and Orlando areas. The Air Cargo industry is also highlighted, as it supports international and interstate trade, handling about $12 billion in goods annually. . The industry's activity is concentrated in the Miami area, with Miami International Airport handling 72 percent of the state's air cargo.

The importance of General Aviation in Florida is also mentioned throughout the document, as it is notes that business aircraft and flight training are important parts of the economy. The climate and geography of Florida create a hospitable pilot training environment. In fact, one in every five pilots in the world has been trained in Florida. This shows the importance of maintaining the infrastructure of the smaller airports along with the economically vital large hub airports in the state, as community airports handle almost 80 percent of all aircraft operations. The importance of General Aviation business aircraft is also shown via a study that indicates that employment in certain economic sectors can be predicted using itinerant air taxi operations.

In addition to the direct economic impacts, there are also indirect and multiplier impacts an airport have on a local economy as passengers spend money throughout the economy.

This document concludes with alternative scenarios that are foreseen possibilities in the next 20 years and could have significant impacts on Florida's aviation system. These scenarios include a possible airport capacity crunch, market disruptions due to issues such as potential terrorism, centralization of aviation services, congestion on the state's roadways and possible technological breakthroughs. A strategy is outlined with which to deal with these scenarios, such as state intervention in local land-use issues to remove local barriers to airport expansion.

In addition, a state initiative to improve air service to small communities is proposed to reduce traffic on roadways. This initiative would also serve to decentralize the aviation traffic in the state. Statewide support of the Small Aircraft Transportation System (SATS) would also serve this purpose as new technology may help mitigate or prevent future congestion and infrastructure shortfalls.

Most importantly, the plan calls for continuing development of a system to track trends, evaluate results, and change the direction of policy as necessary. The document notes that the key to success is to learn from experience, which the new system will be instrumental in ensuring.

Florida Airport Financial Resource Guide
State of Florida Department of Transportation
Published: 2005
Retrieved From: http://www.dot.state.fl.us/aviation/FLPub.htm

Abstract

The Florida Airport Financial Resource Guide has been developed to assist Florida airport managers in their search for grants-in-aid, loans, and other financial assistance programs to enhance the growth of their respective airports and adjacent commercial properties.

It is the primary goal of the Financial Assistance Resource Guide to catalog the variety of successful, innovative approaches that Florida airports have used to generated income in the past. The guide provides only a brief overview of the many "traditional" approaches to airport financial assistance and instead focuses on providing brief program descriptions of the many "creative" financial assistance programs that have proven to be successful. It also identifies points of contact and Internet pages where additional information can be obtained. Finally, it provides some case studies of airports whose implementation of these approaches has proven successful.

The guide is divided into three sections. The first section is an overview and description of the "traditional" methods of funding airport improvements. These include discussions of the Federal programs, such as the Airport Improvement Program (AIP), the Passenger Facility Charge (PFC) program, and Florida Department of Transportation (FDOT) airport enhancement programs.

The second section provides overview descriptions of various "non-traditional" financial assistance programs that have been used to develop airport properties in Florida. These include the Community Development Block Grant (CDGB) programs, the Economic Development Administrations (EDA) programs, the Transportation Enhancement Act for the 21st Century (TEA-21) intermodal and surface transportation program funds, the Enterprise Florida grants and loan programs, the U.S. Department of Agriculture (USDA) Rural Economic Development grants and loan programs, and other similar financial assistance programs. One-page descriptions of the individual programs are contained in Appendix A to provide specific details to the reader.

The third section provides a number of "case studies" and points of contact that illustrate the success stories of specific Florida airports that used or combined individual financial assistance grants and loans into viable revenue- and jobs-producing programs. This guide will be a continually evolving reference aid and will be updated periodically as programs change and new ones are implemented.

The Florida Aviation Project Handbook
State of Florida Department of Transportation
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Abstract

The Florida Department of Transportation (FDOT) Florida Aviation Grant Program is outlined in this handbook. This program is funded through the State Transportation Trust Fund, which the aviation industry partially supports though Florida's aviation fuel tax.

The document outlines how publicly owned, public-use airport are eligible for funds under the grant program. The programs provide funds for various projects that support airport planning, airport improvement, land acquisition, and airport economic development. Specifically, these projects include capital projects on airport property or services that lead to capital projects. Off-airport eligible projects include purchase of mitigation land, noise mitigation, purchase of aviation easements, and access projects for intercontinental airports. Any capital projects must be a part of a Federal Aviation Administration (FAA) and FDOT approved Master Plan/Airport Layout Plan.

The amount of funding often depends on the type of airport. For commercial service airports, the grant program provides up to one-half of the local shares of Federal funding that are available. If Federal funding is unavailable, the program will fun up to 50 percent of the total project cost. When considering a project at a general aviation airport, the funding may be up to one-half of the local share if Federal funding is available. However, if federal funding is not available, the grant program provides up to 80-percent of the project cost. General aviation airports also benefit from the possibility of up to 50-percent of the costs to build an on-airport revenue-producing facility.

Direct grants are only a part of the funds available, as the program also provides for interest-free loans to be given to cover 75 percent of the cost of airport land purchases for both commercial service and general aviation airports. The loans must be repaid to the normal FDOT grant ratio when federal funds become available or in 10 years, whichever comes first. Fund availability will vary from year to year, depending on the amount allocated by the legislature and, in turn, the FDOT. A comprehensive list of the eligible projects for this program is provided for the reader at the end of the document, as well as a key to the level of funding for which an individual project may be eligible.

Airport Compatible Land Use Guidance for Florida Communities
State of Florida Department of Transportation
Published: 2005
Retrieved From: http://www.dot.state.fl.us/aviation/Publicatoins/LandUSeGuide.pdf

Abstract

The Florida Department of Transportation (FDOT) has compiled guidelines for compatible land use using existing technical materials from various agencies, firms, and institutions. The intent of these guidelines is to provide Florida counties and municipalities with the basis necessary to establish compatible land use planning and regulations to manage development, preserve existing public airport operating capacity, and expand aviation facilities to accommodate anticipated growth.

The document is divided into four main sections. The first section is simply an introduction that provides the reader with the background necessary to understand the need for the establishment of these guidelines.

The second section contains information selected from Federal and State documents relating to aviation- or airport-compatible land use planning and regulation. The document does not provide the applicable regulations, rules, and statutes in their entirety, but rather summarizes the basic concepts, agency responsibilities, and agency authority. The documents summarized include those from the Federal Aviation Administration (FAA), Department of Defense (DoD), Environmental Protection Agency (EPA), and Florida State Government.

Section 3 provides details about the three basic elements of aviation-compatible land-use control that require consideration. These elements are airspace protection, compatibility with airport noise, and public safety. These three elements have separate intents and purposes that are highlighted throughout this section. While certain aspects of these elements can share common zoning boundaries, each element requires independent review and justification.

Section 4 discusses several significant considerations necessary in the adoption or administration of land use regulations. Although local governments are responsible for land use controls through zoning and regulation, FDOT is required by statute to provide any political subdivision with technical assistance in the preparation of these land use controls. Additionally, adequate land use controls in multiple jurisdictions is a frequently encountered difficulty for Florida airports and is addressed in this section.

Appendix A provides models and examples for the following: a comprehensive airport zoning ordinance, airport noise and overflight zone compatibility land use charts, an avigation easement model, noise disclosure statement, recommended sound level reduction construction methods and materials lists, octave band noise spectrum graph and sample permit forms.

Appendices B and C provide reference materials and a glossary, respectively.

Policies and Procedures – Airport Economic Development Program
State of Florida Department of Transportation
Published: 2005
Retrieved From: http://www.dot.state.fl.us/Publictransportation/policylegis.htm

Abstract

This document provides policy guidance as to the administrations or airport economic development projects. Definitions for the terms Economic Development Project, Fair Market Value (FMV), General Aviation Airport, and Qualified Appraiser are provided at the beginning of the document as the terms are used throughout.

It is noted that the primary objective of the Airport Economic Development Program is to encourage development of on-airport property that will promote airport financial self-sufficiency. The program is a 50-50 State and local matching grant program. District public transportation managers identify projects that achieve the state's objective through the solicitation of applications from airport sponsors in their respective districts. The application should include a financial analysis completed by the airport sponsor that demonstrates the revenue-producing potential of the proposed project. After the proposed projects are submitted, each is prioritized based upon the merit of the project, the needs of the airport concerned, and the airport's ability to fund the project.

An appraisal process must also be completed in determining the FMV of the proposed development. This process varies depending on the funding sources. If the project is funded entirely by the airport sponsor and the State, an independent appraisal by a qualified appraiser is used as a basis for establishing the FMV for the project. This FMV will then be used to determine the fair rental value, which should annually be 8-12 percent of the FMV. Should the airport sponsor's portion of the project be supported by the private sector, an FMV should still be obtained through an independent appraiser for the non-private portion of the development. If the total project cost is in excess of $1 million, FMV appraisals are to be performed by a qualified appraiser, and a review appraisal must be obtained.

The document provides for specific leasing requirements that should be followed when an airport sponsor is drawing up tenant leases, as well as a list of minimum lease clauses. These should include escalation clauses that stipulate that rental rates shall be adjusted at a minimum, every five years. However, making an annual Consumer Price Index adjustment is also a viable option, as it would make the five-year adjustment less radical.

It is also noted that an approved Airport Layout Plan should be available that depicts the entire property, identifies the present facility, and outlines any plans for future development. It therefore becomes the controlling instrument in aviation and non-aviation development, as it identifies those areas that may be leased to conduct non-aviation business activities.

H. FLORIDA STATUTE CHAPTER 330 AND FLORIDA ADMINISTRATIVE CODE RULE 14-60

All master plans submitted to FDOT must be in compliance with Florida Statutes Chapter 330, *Regulation of Aircraft, Pilots, and Airports* (FS Chapter 330) and the Florida Administrative Code Rule 14-60, *Airport Licensing, Registration, and Airspace Protection* (Rule 14-60). Both deal with the registration and licensing of public, private, and temporary airports in the State of Florida. Rule 14-60 also determines the minimum standards for Florida licensed airports. These standards include but are not limited to the following:

- All airports licensed by the state of Florida, whether public or private, must meet the FDOT minimum standards.
- Airports that hold an FAA Part 139 certificate are considered to comply with the FDOT minimum standards.
- If an airport does not meet the minimum standards, but FDOT determines that an exception to the standards is warranted, they may issue a "special" license that states the conditions under which the license was granted.
- All airports must comply with the effective landing area length and minimum landing area width for the type of landing area shown in Table III-13.

Table III-13
FLORIDA LICENSED AIRPORT MINIMUM LANDING AREA STANDARDS

Landing Area Type	Effective Landing Area Length in Feet	Minimum Landing Area Width in Feet
Runway	2,400	60
Short Field Runway	800	60
Ultralight	300	150
Seaplane [1]	2,500	200
Helipad	24	24

[1] Seaplane landing areas shall have a minimum depth of three feet.
Source: FAC Rule 14-60

All licensed airports must comply with the landing and surface areas as shown in Table III-14.

Table III-14
FLORIDA LICENSED AIRPORTS LANDING AND SURFACE AREAS

Landing Area		Primary Surface		Approach Surface				Transition Surface	
Surface	Approach	Length in Feet	Width in Feet	Ratio	Length in Feet	Width in Feet Inner	Width in Feet Outer	Ratio	Distance in Feet
Not Paved	Visual	End of Runway	250	20:1	5,000	250	1,250	N/A	N/A
Paved & Aircraft Weight < = 12,500 Pounds	Visual	200 Feet Beyond End of Runway	250	20:1	5,000	250	1,250	N/A	N/A
	Non Precision		500	20:1	10,000	500	2,000	7:1	150 Feet Vertical
Paved & Aircraft Weight > 12,500 Pounds	Visual	200 Feet Beyond End of Runway	500	20:1	5,000	500	1,500	N/A	N/A
	Non-Precision Visibility > ¾ Mile		500	34:1	10,000	500	3,500	7:1	150 Feet Vertical
	Non Precision Visibility = ¾ Mile		1,000	34:1	10,000	1,000	4,000	7:1	150 Feet Vertical
	Precision		1,000	50:1 Then 40:1	10,000 Then 40,000	1,000	16,000	7:1	150 Feet Vertical
Helicopter Final Approach and Takeoff Area (FATO)	Visual	42	42	8:1	4,000	42	500	2:1	250 Feet Vertical
	Non Precision	500	500	34:1	10,000	500	5,000	4:1	350 Feet Vertical
	Precision	1,000	1,000	50:1	25,000	1,000	6,000	7:1	350 Feet Vertical
Ultralight Area	Visual	End of Runway	150	15:1	2,500	150	625	N/A	N/A
Seaplane Marked	Visual	End of Runway	250	20:1	5,000	250	1,250	N/A	N/A
Seaplane: Not Marked	Visual	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Source: FAC Rule 14-60

All licensed airports must comply with the Runway Safety Areas shown in Table III-15.

Table III-15
FLORIDA LICENSED AIRPORTS RUNWAY SAFETY AREA

Landing Area Type	Safety Area Length in Feet	Safety Area Width in Feet
Runway (Not Paved)	End of Runway	120
Runway (Paved)	240 Feet Beyond End of Runway	120
Ultralight	300	150
Heliport	20 Feet Beyond FATO	20 Feet Beyond FATO
Seaplane	N/A	N/A

Source: FAC Rule 14-60

The standard measurement for "Pavement Condition Index" ("PCI") results in seven ratings from "Excellent" to "Failed," as shown in Table III-16. A runway PCI value of 10 or below indicates that the pavement has deteriorated significantly and the runway pavement shall be considered by FDOT to not meet acceptable licensed airport standards. Temporary remedies may include displacement of the threshold, shortening the length of the runway to no less than the minimum effective length, or closing the runway until permanent corrective action can be completed. Depending on the number of runways available and the extent of pavement condition index deficiencies, failure to implement temporary or permanent remedies will result in FDOT revoking the airport license on the ground that the airport has become unusable due to unsafe conditions.

Table III-16
FLORIDA LICENSED AIRPORTS PAVEMENT CONDITIONS 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

- All licensed airports will comply with the following:
  - At least one 15-knot, 8-foot long installed windsock. The windsock must be lighted if the landing area is lighted.
  - Any aircraft tie-downs or moorings used to secure aircraft will be located outside of the landing area, primary surface, and transition surface areas.
  - Airport operators must establish and enforce effective control of unauthorized vehicles and pedestrian access within the aircraft movement areas.
  - Except at ultralight flightparks, an approved 75-foot diameter airport circle marker (segmented circle), including aircraft traffic pattern indicators, must be installed at airports without control towers, which have other than standard traffic patterns. The segmented circle must be lighted, if the landing area is lighted.
  - At least two category 80-B-C, or higher, type fire extinguishers must be available at the

airport, readily accessible, operationally functional, bear an unbroken seal, and be located in an area clearly identified to the public.

- An operational public telephone must be available at the airport on a 24-hour basis and its location must be clearly identified to the public.
- Airport hazards determined to exist by FDOT must be removed.
- Obstructions must be marked and/or lighted in accordance with F.A.C. Rule 14-60.009. If the obstructions are applicable to Section 333.025, Florida Statutes, the obstructions must be permitted pursuant to that section, or may be subject to variance under a local zoning ordinance.
- The owner or lessee must maintain the field in a usable condition. If the airport becomes dangerous or is not usable, it is the responsibility of the airport owner or lessee to mark the danger area by means of flags or to indicate the closing of the airport or runway by an "X," clearly visible from the air or in a manner consistent with the exigencies of the situation. The owner or lessee must report, in writing, to FDOT any planned or emergency work in progress on the field and any proposed changes or conditions which might render the field unsafe for use.
- The owner or lessee of a closed, unlicensed, or abandoned airport must remove all airport identifying markers and wind indicators and must place upon the runway or runway intersection an FDOT approved "closed runway" marking. If the owner does not properly mark the airport within 60 days of notice, FDOT will have the airport appropriately marked and will assess the costs to the owner or lessee.

- Licensed airports that include a seaplane landing area must have at least one U.S. Coast Guard approved life preserver of the ring or throwing type with a retrieval line attached to each, readily available during hours of operation.
- The following airport marking requirements apply to licensed airports:

Markers must be installed on both sides of non-paved runways at 200-foot intervals along the edge of the usable runway width. Three markers must be placed at 10-foot intervals on each side of each end of the runway, perpendicular to the centerline of the runway. Each set of three markers must start at the corner of the runway and run toward the centerline of the runway on the runway endline.

- Displaced thresholds at non-paved licensed airports must be marked with at least three markers on each side of the displaced landing thresholds area where the effective runway length begins. The displaced threshold markers must be no more than 10 feet apart, similar to the runway edge markers, and be placed, clear of the runway, on a centerline 90 degrees to the runway heading.
- Runway designation markings must be white and consist of a number and must be supplemented by a letter on parallel runways. The number must specify the whole number to the nearest ten degrees of the magnetic azimuth when viewed from the direction of the approach. The size and spacing of the numbers and letters must only be reduced when space is limited. All numerals except the number "11" must be horizontally spaced fifteen feet apart. The number "11" must be spaced 27 feet apart. A zero ("0") must not precede single digits. The numeral "1," when used alone, must contain a horizontal bar at the bottom of the numeral to differentiate it from the runway centerline marking. Single digits must be centered on the runway centerline. Double digits must be centered on the runway centerline at the point that is halfway between the outer edges of the two numerals. Letters, such as "L," "C," or "R" for "Left," "Center," or

"Right," must be stacked beneath the number at a distance of 20 feet. The base of the letter or number must start 20 feet from the threshold or 40 feet from threshold markings. Digits must be 60 feet tall. The lines comprising the digits must be five feet wide. Digits must be proportional and must be between 6 and 7.5 feet wide.

- Runway centerline markings must be white and must identify the physical center of the usable runway surface and must extend the length of the runway. The stripes must be 120 feet in length. The gaps must be 80 feet in length. The minimum width of the stripe must be 12 inches. The stripes must begin 40 feet from the top of the runway designation marking.
- Threshold bars must be white and must delineate the beginning of the runway that is available for landing. The threshold bar must be ten feet wide and must extend across the width of the runway.
- Arrows and arrowheads must be white and must be used to identify a displaced threshold. Arrowheads, used in conjunction with a threshold bar to highlight the beginning of the runway, must be placed five feet before the threshold bar and must be spaced two feet apart for runways 60 feet wide, 3 feet apart for runways between 60 and 100 feet wide, and four feet apart for runways over 100 feet wide. Arrows must be provided in the portion of the runway before the displaced threshold. Arrowheads must be 45 feet long, 15 feet wide, and have stripes 3 feet wide. Arrow tails must be 80 feet long and 18 inches wide. The overlap between the arrowheads and tails must be five feet. Arrows must be spaced 80 feet apart.
- Holding position markings for paved taxiways must be yellow and must identify the location where a pilot should be assured that there is adequate separation with other aircraft before proceeding onto the runway. Holding position markings consist of four lines and three spaces each six to 12 inches wide. The solid lines must always be on the side where the aircraft is to hold. The two dashed lines and spaces must be three feet long. The markings must extend completely across the taxiway. The markings must be installed perpendicular to the taxiway centerline, but may be angled as needed where two or more taxiways intersect at the hold line. Holding position markings must be placed 125 feet from visual runways serving small aircraft, 150 feet from visual runways serving large aircraft or with non-precision approaches, and 200 feet from runways with a precision approach.
- Holding position signs for unpaved taxiways must be located outside the primary surface on the left side of the taxiway for a taxiway that is less than or equal to 150 feet wide or on both sides of taxiways that are greater than 150 feet wide. The sign must consist of the runway designation numbers separated by a dash such that their arrangement indicates the direction to the corresponding runway threshold. The numbers must be white on a red background. Mounting legs for each sign must be frangible. The sign face must be no less than 18 inches tall and 30 inches wide. The runway designation numbers must be no less than 12 inches tall. The sign must stand no more than 42 inches high.
- Closed runway markings must be yellow and consist of an "X" centered on the runway centerline at each end of the runway and at 1,000 foot intervals. The "X" must be 60 feet across and each arm must be 10 feet wide and 25 feet long. If the "closed" runway intersects an "open" runway, an "X" must be placed on each side of the "open" runway. Runway designation markings and runway threshold markings must be obliterated on closed runways.
- Helipad markings must be white and are used to mark the intended landing position

within the Final Approach and Takeoff Areas (FATO). The marking must consist of an in-ground letter "H" oriented on the axis of the dominant landing and takeoff path. The "H" must be a minimum of 19 feet tall and 12.5 feet wide. The vertical lines must be 16 inches wide. The horizontal line must be 32 inches wide.

- Touchdown and Lift-Off (TLOF) surfaces for rotorcraft and tilt rotor aircraft perimeters must be defined by a continuous white solid line one foot wide.
- FATO perimeters must be defined with white dashed lines, which must be one foot wide and five feet long and must join to define the FATO corners.
- Common Marking Requirements:
  - Glass beads are required for all permanent pavement markings.
  - All markings on light colored pavements must be outlined with a black border six inches or greater in width.

- FDOT does not require airports to be lighted. However, if an airport is lighted, it must comply with the following standards
  - The minimum lights that must be provided are threshold and runway end lights, displaced threshold lights, segmented circle lights, FATO or TLOF lights, and windsock lights.
  - All lights must be on flush or frangible mounts not more than 14 inches tall. The following airport lighting requirements must apply to licensed airports:
    - Runway edge lights must emit white light except that yellow light is substituted for white light on the last 2,000 feet of an instrument runway, or one-half of the runway length, whichever is less, to indicate the caution zone.
    - Threshold and runway end lights must be located on a line perpendicular to the extended runway centerline not less than two feet nor more than ten feet outboard from the designated threshold of the runway. The lights must be installed in two groups located symmetrically about the extended runway centerline. For instrument runways, each group must contain four lights; for other runways, each group must contain three lights. The outmost light in each group must be located in line with the runway edge lights. The other lights in each group must be located on 10 foot centers toward the extended runway centerline. The lights must be red on the inboard half and green on the outboard half.
    - Displaced threshold lights must be located outboard of the runway. The innermost light of each group must be located in line with the runway edge lights, and the remaining lights must be located outward at 10-foot intervals on a line perpendicular to the runway centerline. The runway end lights must be red all the way around. The displaced threshold lights must be green on the outboard half. The inboard half of displaced threshold lights must be yellow for an instrument runway and white for a visual runway.
    - Taxiway edge lights must emit blue light.
    - FATO or TLOF lights must emit yellow light and must define the limits of the FATO or TLOF. Both FATO and TLOF lights must not be lit concurrently.

References

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