
# Guidebook for Managing Small Airports - Second Edition (2019)



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AIRPORT COOPERATIVE RESEARCH PROGRAM

ACRP RESEARCH REPORT 16

# Guidebook for Managing Small Airports

## *Second Edition*

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## AIRPORT COOPERATIVE RESEARCH PROGRAM

Airports are vital national resources. They serve a key role in transportation of people and goods and in regional, national, and international commerce. They are where the nation's aviation system connects with other modes of transportation and where federal responsibility for managing and regulating air traffic operations intersects with the role of state and local governments that own and operate most airports. Research is necessary to solve common operating problems, to adapt appropriate new technologies from other industries, and to introduce innovations into the airport industry. The Airport Cooperative Research Program (ACRP) serves as one of the principal means by which the airport industry can develop innovative near-term solutions to meet demands placed on it.

The need for ACRP was identified in *TRB Special Report 272: Airport Research Needs: Cooperative Solutions* in 2003, based on a study sponsored by the Federal Aviation Administration (FAA). ACRP carries out applied research on problems that are shared by airport operating agencies and not being adequately addressed by existing federal research programs. ACRP is modeled after the successful National Cooperative Highway Research Program (NCHRP) and Transit Cooperative Research Program (TCRP). ACRP undertakes research and other technical activities in various airport subject areas, including design, construction, legal, maintenance, operations, safety, policy, planning, human resources, and administration. ACRP provides a forum where airport operators can cooperatively address common operational problems.

ACRP was authorized in December 2003 as part of the Vision 100—Century of Aviation Reauthorization Act. The primary participants in the ACRP are (1) an independent governing board, the ACRP Oversight Committee (AOC), appointed by the Secretary of the U.S. Department of Transportation with representation from airport operating agencies, other stakeholders, and relevant industry organizations such as the Airports Council International-North America (ACI-NA), the American Association of Airport Executives (AAAE), the National Association of State Aviation Officials (NASAO), Airlines for America (A4A), and the Airport Consultants Council (ACC) as vital links to the airport community; (2) TRB as program manager and secretariat for the governing board; and (3) the FAA as program sponsor. In October 2005, the FAA executed a contract with the National Academy of Sciences formally initiating the program.

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COOPERATIVE RESEARCH PROGRAMS

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# FOREWORD

By Theresia H. Schatz
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*ACRP Research Report 16: Guidebook for Managing Small Airports*, Second Edition, is designed to help airport practitioners, owners, operators, managers, and policymakers of small airports, who may have varying degrees of experience and backgrounds, to fulfill their responsibilities in such areas as financial management, oversight of contracts and leases, safety and security, noise impacts, community relations, compliance with federal and state obligations, facility maintenance, and capital improvements. The first edition has been edited and reformatted for currency, relevance, and usability and updated with additional information and new subject areas (e.g., unmanned aircraft systems, geographic information systems, digital Notices to Airmen, social media, and federal and state obligations). Also hyperlinks to many of the documents and resources mentioned in this report, such as ACRP publications, industry sources and sample checklists, have been collected into *ACRP WebResource 6: Resources for Managing Small Airports* (crp.trb.org/acrp0132).

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Since the publication of *ACRP Report 16: Guidebook for Managing Small Airports* (2009), a significant amount of research that could be of direct benefit to small airports has been completed, and the Federal Aviation Administration, state agencies, and trade and industry groups have developed and initiated new policies and guidance. In addition, small airports are facing new industry challenges not addressed in the first edition (e.g., unmanned aerial systems). Therefore, an update was needed.

Under ACRP Project 01-32, research was conducted by Hanson Professional Services Inc. in association with Marr/Arnold Planning, LLC, and David NewMyer of Southern Illinois University. The research was conducted through industry outreach via a survey of small airport managers identified through coordination with state agencies and various roundtable discussions held at industry conferences. Additionally, an industry panel comprising several geographically diverse small airports served as a sounding board for the research team at key points in the study process. A resource review examined written and electronic documents that provide the regulations and existing guidance for best practices on managing small airports. Based on this review and industry input, the guidebook is organized into management areas and is intended to be used as a self-help guide, providing the user with key insights, definitions, and background on many small airport management topics as well as links to additional resources.

# CONTENTS

Note: Photographs, figures, and tables in this report may have been converted from color to grayscale for printing. The electronic version of the report (posted on the web at www.trb.org) retains the color versions.

CHAPTER 1

# Introduction

*ACRP Report 16: Guidebook for Managing Small Airports*, published in 2009, has been one of the most frequently accessed and used ACRP documents. Since it was published, the aviation industry has continued to evolve; regulations have changed and additional ACRP documents providing resources for managers of small airports have been published. Two of the most notable changes in the aviation industry are the continued implementation of the Next Generation Air Transportation System (NextGen) modernization of the National Airspace System (NAS) and the exponential increase in the operation of unmanned aircraft systems (UAS).

To continue to provide a useful and relevant resource for small airport managers, ACRP Project 01-32, "Update Report 16: Guidebook for Managing Small Airports," was initiated. This update, known as *ACRP Research Report 16: Guidebook for Managing Small Airports*, Second Edition (*ACRP Report 16*, 2nd edition), provides new and updated material to keep the guidance relevant. It also transforms the original report into a concise, user-friendly, self-help guidebook augmented by *ACRP WebResource 6: Resources for Managing Small Airports* that connects the guidebook to available electronic resource documents and tools.

## Key Insights

*The airport manager is responsible for providing on behalf of the airport owner a safe, secure and regulatory-compliant facility that delivers aviation services, through managing resources and controlling risk while concurrently serving as a developer and community liaison.*

*This guidebook is intended to provide information to assist an airport manager in the wide range of responsibilities associated with the management of small airports.*

*Industry outreach to small airport managers around the country was conducted to seek their input to make this an appropriate resource.*

*This guidebook does not seek to recreate all the small airport management resources available, but rather to serve as a compass to direct small airport managers to the resources pertinent to their needs in managing the risks and multiplicity of needs associated with operating an airport.*

## Key Definitions

**Airport Improvement Program (AIP)**: A program that provides financial grants to primarily public agencies for the planning and development of public-use airports that are included in the National Plan of Integrated Airport Systems.

**Airport director or airport manager**: The person responsible for the day-to-day operation of an airport, including the business, administration, operational and communication aspects and the implementation of policy guidance and longer-term plans for the airport.

**Airport sponsor**: Typically a public agency or tax-supported organization that is authorized to own and operate an airport, obtain funds and property interests and be legally, financially and otherwise able to meet all applicable requirements of laws and regulations. Occasionally, it is a private entity.

**Commercial service airport**: An airport with scheduled passenger service and at least 2,500 passengers boarding per year.

**Federal Aviation Administration (FAA)**: The United States Department of Transportation's agency for aviation. In addition to regulating airports, aircraft manufacturing and parts certification, aircraft operation and pilot certification ("licensing"), the FAA operates air traffic control, purchases and maintains navigation equipment, certifies airports and aids airport development, among other activities.

**Federally obligated airport**: An airport that has accepted federal grant funds and the associated requirements known as grant assurances.

**General aviation (GA)**: All civil aviation (excluding military) except those classified as air carrier or air taxi. The types of aircraft typically used in GA activities vary from multiengine jet aircraft to single-engine piston aircraft for purposes such as personal, business and instructional flying.

**General aviation airport**: Airport not classified as commercial service or military.

**National Plan of Integrated Airport Systems (NPIAS)**: Public-use airports considered necessary to provide a safe, efficient and integrated system of airports to meet the needs of the United States civil aviation, national defense and the U.S. Postal Service.

**Nonhub commercial service airport**: Airport with more than 2,500 annual passenger boardings (enplanements) but less than 0.05 percent of the national passenger boardings.

**Nonprimary commercial service airports**: Airports with scheduled passenger service and annual passenger boardings (enplanements) between 2,500 and 10,000.

**Nonprimary airport**: An NPIAS airport with 10,000 or fewer annual passenger boardings (enplanements).

**Policymakers**: Individuals who have the authority to set the policy framework of (or determine the policies for) an organization. In the case of small airports, policymakers include the members of the airport's governing body or airport sponsor. Some examples of policymakers include city council members, county commissioners and airport board members.

**Small airport (as defined for this guidebook)**: General aviation, nonhub commercial service and airports with limited and/or volunteer staff.

## 1.1 Approach to Project

*ACRP Report 16*, 2nd edition builds on the first edition by using the data in the original report as background information. This data was then reformatted, edited and expanded for currency and relevance. To serve as a self-help guide for small airport managers, drawing from the results of a small airport industry survey, this second edition drills down further to provide the "how to" application guidance within the changing aviation environment. Most airport

managers can identify the issues or challenges facing their airports but may not be sure where to look or have the time to dig for answers. *ACRP Report 16*, 2nd edition is intended to serve as a go-to resource to fill in those management practice gaps with best practices and tools that small airport managers can use to address their issues. The best practices and tools in, or associated with, this guidebook include items such as sample documents, decision flowcharts and other graphics to provide guidance and resources.

Airports with small or limited staff frequently contract for outside assistance with engineers, consultants and other specialty services. This guidebook includes information on small airport management functions that may use outside services to provide the small airport manager with background information to assist in contracting for and managing the services.

## Organization of the Guidebook

Two introductory chapters are included in the guidebook to set the stage for the management function chapters, as shown in Table 1. Chapter 1: Introduction describes the organization and guidebook use strategies. Chapter 2: Airport Roles—Key Classifications and Regulations in the Airport System describes the airport's roles within the aviation system, its relationship to grant funding and federal requirements and its benefits to your community. Chapters 3 through 6 cover the following four overarching management function areas:

- Business: financial and administration management
- Operations: running a safe, secure and efficient airport
- Asset Management: maintaining the current assets and planning development for the future
- Communications: promoting the airport and connecting with the community

Because, within the guidebook's definition of small airports, some small airports that support commercial service operations are included, stand-alone Chapter 7: Commercial Service—Attracting Airlines and Transitioning to Airline Service is dedicated to small airports and their related commercial service topics.

**Table 1. Organization of the guidebook.**

| Chapters | Contents |
|---|---|
| **Introductory Chapters** | |
| **Chapter 1:** Introduction | Purpose of and usage tips for the guidebook and web resource |
| **Chapter 2:** Airport Roles—Key Classifications and Regulations in the Airport System | Identify your airport's role, funding opportunities and design standards |
| **Management Function Chapters** | |
| **Chapter 3:** Business—Financial and Administrative Management | Financial and administrative management functions |
| **Chapter 4:** Operations—Running a Safe, Secure and Efficient Airport | Daily to specialty operating functions |
| **Chapter 5:** Asset Management—Maintaining Current Assets and Planning Development for the Future | Preserving and protecting existing assets and planning for future development |
| **Chapter 6:** Communication—Promoting the Airport and Connecting with the Community | Ongoing, promotional and emergency communication strategies |
| **Commercial Service Chapter** | |
| **Chapter 7:** Commercial Service—Attracting Airlines and Transitioning to Airline Service | Nonhub scheduled passenger service information for small airports with or considering commercial service |
| **Additional Resources** | |
| Aviation-Related Abbreviations, Glossary, and Bibliography | Additional reference material |

Within the chapters, there are separate sections dedicated to specific small airport management topics. To allow these sections to be used as stand-alone references, each section opens with key insights and definitions related to that topic. The key insights are related to that topic and are designed to summarize the significant takeaway material. The definitions are for key terms used within that section. In addition, the key definitions throughout the guidebook, along with related small airport management terms, are also summarized in the glossary, because survey participants, especially those less familiar with aviation, indicated they used the glossary as an educational tool.

When using the electronic guidebook, you can typically access the search function through a magnifying glass or Crtl+F to search for keywords in the document.

Because many small airport management topics are interconnected, the electronic version of the guidebook contains links between related topics. While the links appear the same in the electronic copy of the guidebook, there are two types. One type of link is to related sections in the document. The other type of link is to external resources. The goal of the links is to allow the user to access the topic of interest and then readily move to related matter as needed.

## Icons

To further assist in using *ACRP Report 16*, 2nd edition as a ready reference guide, icons are used throughout the document to highlight applicability or important information (see Figure 1).

## ACRP WebResource 6: Resources for Managing Small Airports

This guidebook has been prepared to provide you, the small airport manager, with a basic understanding of and best practices guidance on a broad range of subjects related to small airport management, with the goal of providing ideas for new methods or approaches you may not already be using. The electronic guidebook is enhanced with direct links to online resources, which are also compiled in *ACRP WebResource 6*, to enable you to dig deeper into selected topics.

**Editable template:** Document in *ACRP WebResource 6* that can be customized

*ACRP WebResource 6* contains annotated links to existing ACRP, FAA, state, industry and other relevant resources. It also contains editable tools and templates to support the guidance contained in *ACRP Report 16*, 2nd edition so you can take the information and quickly put it into practice. These editable documents are indicated by a pencil icon in the guidebook.

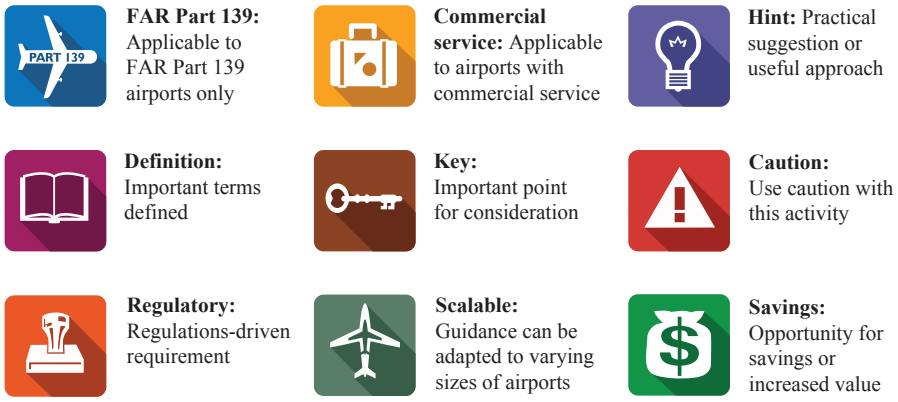



***Figure 1. Icons used in* ACRP Report 16*, 2nd edition.***

The resources within *ACRP WebResource 6* are organized by guidebook chapter and, thus, topic. In addition to a hyperlink to the resources, the resource title and a short summary of each are provided. These summaries contain keywords for the web resource search function. In the event a link to a resource becomes broken, the title and summary information should enable you to conduct a search for the document outside the web resource.

*ACRP Report 16*, 2nd edition will be most effective when used in the electronic format. When used electronically, links between the guidebook and online resources will enable you to click on the identified resource in the guidebook and go to the resource document or website. In addition, *ACRP WebResource 6* is searchable and, because it is organized by chapter topic, can be used independently of the guidebook.

## 1.2 Intended Audience

For this guidebook, *small airport* is defined as general aviation, nonhub commercial service and airports with limited and/or volunteer staff.

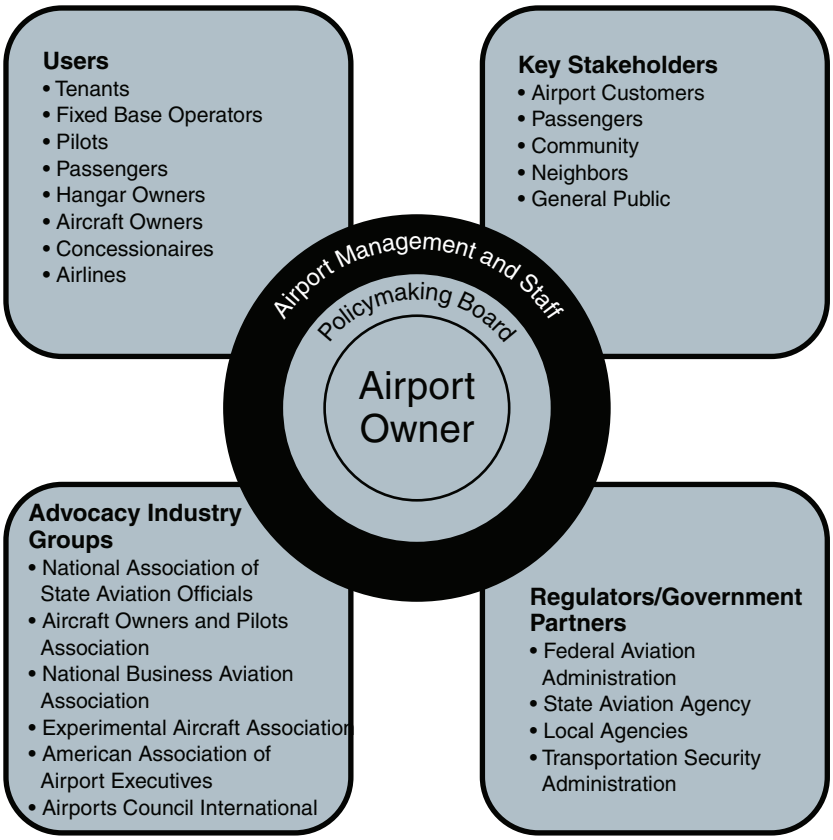
*ACRP Report 16*, 2nd edition is designed to serve managers of small airports. Small airport management is a very broad field, and small airport managers tend to have a variety of responsibilities, from finance to facility management to leasing to grass mowing or snow plowing. At many small airports, the airport manager tends to be responsible for multiple management functions. Small airport managers come from varying educational and aviation backgrounds. In addition, at many small airports, the staffing is limited, meaning the small airport manager is frequently seen as the lead for all management areas. Therefore, this guidebook is designed to assist the small airport manager by providing a self-help reference to aid in addressing the many facets of the position.

In addition to being responsible for multiple management functions, the airport manager also plays a key role in the day-to-day functions of the airport and is the interface between the policymaking board and the users, stakeholders, industry groups and regulators. The manager generally operates under and carries out the desires of a policymaking board while serving as the face of the airport to the other parties and the community.

The airport manager is the liaison between the airport owner, which is a governmental entity at a publicly owned airport, and the airport policymaking board. The policymaking board may be a board established for the sole purpose of airport oversight, or it may be part of a city department or division. While the policymaking board sets the policy, the airport manager is responsible for implementing the policy or the resulting rules and regulations established to implement the policy. *ACRP Report 58: Airport Industry Familiarization and Training for Part-Time Airport Policy Makers* provides a tool for the small airport manager to use to assist members of the policymaking board in understanding the airport, its role and funding sources.

At a small airport, the airport manager interacts with four general audiences (as shown in Figure 2): airport users—those who conduct operations or an aviation business; key stakeholders—the customers, neighbors and community served by the airport; national advocacy groups; and regulators.

While this guidebook can be used for any airport, the data included has been prepared to support public-use small airports. The size of small airports encompassed by the guidebook definition includes GA, reliever, commercial service and nonhub primary airports within the NPIAS). The general aviation definition includes basic, local, regional and national GA airports, as defined in the FAA's General Aviation Airports: A National Asset. In addition, there are numerous small airports within state aviation systems that are not part of the NPIAS to which this guidebook should be useful. More details on the types of small airports and their role in the aviation system are included in Chapter 2.




Source: *ACRP Report 58: Airport Industry Familiarization and Training for Part-Time Airport Policy Makers*, 2011

***Figure 2. Airport manager relationships.***

## 1.3 Industry Survey

In the effort to update the first edition of *ACRP Report 16* to create a concise document focused on the most common needs of small airport managers, the first step was industry outreach. The desired outcome from the outreach was to identify key information needs and the gaps that needed to be filled by the updated guidebook. The findings from this outreach were used to guide the resource review.

While there are common challenges among small airports, each airport is unique, as is its geographic location. The goal of the industry outreach was to identify common gaps in small airport management practices for which guidance is desired, and any unique geographical needs. Secondly, data on the demographic profile of small airport managers was gathered to align the updated guidebook with the most common levels of professional, educational and experience backgrounds of small airport managers.

The candidate airports were identified through coordination with state aviation agencies. The research team sought the help of these agencies to identify potential survey candidates, because in many cases, these agencies have the most frequent contact with small airports. Each agency was asked to recommend 5 to 10 airport managers representing the diversity of small airports within its state. The industry survey was distributed electronically and consisted of 35 multiple-choice, ranking and open-ended questions, allowing the responders to provide as much detail or insight as desired. The key results of the survey are shown in Figure 3.

The small airport manager industry outreach survey was sent to 322 airport managers representing 331 facilities within the broad range of small airports. During the 30-day survey period, 114 small airport managers responded to the survey for a 35 percent response rate. The respondent sample group exhibited the general demographic and geographical characteristics of the original survey group. A summary of the survey results is included in *ACRP WebResource 6*.

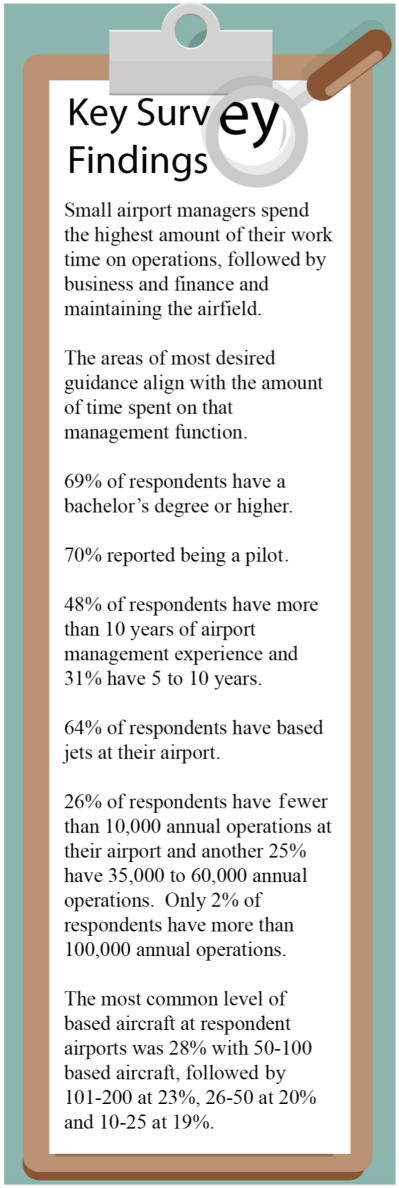



***Figure 3. Key findings of the industry survey performed for ACRP 01-32 (November 2017).***

## 1.4 Common Resources

This guidebook is intended to serve as a compass to guide the user to relevant resources available as of its publication. The following summarizes the most common resources beneficial to small airport managers, many of which are incorporated as references throughout this guidebook and are part of *ACRP WebResource 6*. This list is not intended to be exhaustive but to identify many of the most frequently used resources.

### Federal Aviation Regulations

Public-use airports, especially those accepting grant funding from the FAA, are subject to a number of federal regulations. The aviation regulations are found in Title 14 of the Code of Federal Regulations (CFR), commonly referred to as Federal Aviation Regulations (FAR). These regulations regulate aircraft, airmen, airports and the NAS. Many of these regulations apply to small airports, and as with any legislation, they may change. The most commonly referenced regulations for small airports include the following:

- **FAR Part 77: Objects Affecting Navigable Airspace.** Part 77 establishes standards for determining obstructions in navigable airspace, outlines the requirements for notifying the FAA of certain proposed construction or alteration and provides for aeronautical studies of obstructions to air navigation in order to determine their effect on the safe and efficient use of airspace. Section 77.25 of this part establishes imaginary surfaces around airport runways, approach zones and navigable airspace in the vicinity of the airport.
- **FAR Part 107: Small Unmanned Aircraft Systems.** Part 107 establishes the registration of airmen and the certification and operation of small (weighing less than 55 pounds) UASs within the United States. Subpart B: Operating Rules is most relevant to airport managers.
- **FAR Part 137: Agricultural Aircraft Operations.** Part 137 prescribes the rules governing agricultural aircraft operations within the United States and the issuance of commercial and private agricultural aircraft operator certificates for those operations.
- **FAR Part 139: Certification of Airports.** Part 139 prescribes rules governing the certification of airports accommodating scheduled passenger service with aircraft seating more than 9 passengers or unscheduled service with aircraft seating at least 31 passengers, with some specific exceptions for airports in Alaska.
- **FAR Part 150: Airport Noise Compatibility Planning.** Part 150 applies to the airport noise-compatibility planning activities of public-use airports, including heliports. It outlines the procedures for developing and submitting airport noise-compatibility programs.
- **FAR Part 151: Federal Aid to Airports.** Part 151 provides detailed information regarding FAA airport construction and development grants. It also specifies that all airport development under the federal-aid airport program must be done in accordance with an approved airport layout plan. Each airport layout plan and any changes to the layout are subject to FAA approval.

- **FAR Part 152: Airport Aid Program.** Part 152 applies to airport planning and development under the Airport and Airway Development Act of 1970, as amended. It outlines eligibility requirements and application procedures; funding, accounting and reporting requirements; nondiscrimination in airport aid programs; suspension and termination of grants; and energy conservation programs.
- **FAR Part 156: State Block Grant Pilot Program.** Part 156 establishes the procedure by which a state may apply to participate in the state block grant pilot program, the program administration requirements, the program responsibilities for participating states and the enforcement responsibilities of participating states.
- **FAR Part 157: Notice of Construction, Alteration, Activation and Deactivation of Airports.** Part 157 defines the requirements for notifying the FAA when proposing to construct, alter, activate or deactivate a civil or joint-use (civil/military) airport or to alter the status of such an airport.
- **FAR Part 158: Passenger Facility Charges (PFCs).** Part 158 applies to the passenger facility charges that may be approved by the FAA and imposed by a public agency that controls a commercial service airport.
- **FAR Part 170: Establishment and Discontinuance Criteria for Air Traffic Control Services and Navigational Facilities.** Part 170 sets the federal criteria for the establishment of air traffic control services.

While not directly applicable to small airports, the FARs below define aircraft operating rules. For example, FAR Part 91 includes the requirements for how aircraft operators calculate the needed runway length for landing.

- **FAR Part 91: General Operating and Flight Rules.** Part 91 prescribes the rules governing the operation of aircraft within the United States, including the waters within 3 nautical miles of the United States coast. It also establishes the requirements for operators to take actions to support the continued airworthiness of each aircraft.
- **FAR Part 121: Operating Requirements: Domestic, Flag and Supplemental Operations.** Part 121 establishes the requirements for air carrier operators.

## FAA Advisory Circulars

FAA advisory circulars are written guidance to the airport industry. However, when an airport accepts an AIP grant and its assurances, advisory circulars become essentially regulatory because they describe how to meet the condition of a "manner approved by the administrator." The 150 series is focused on airports and addresses:

- Aircraft rescue and firefighting (ARFF)
- Airport compliance/obligations
- Airport design, construction and maintenance
- Airports geographic information systems (Airports GIS)
- Airport Improvement Program
- Airport lighting
- Airport pavement design
- Airport planning
- Airport safety
- Certification of Airports (Part 139)

Some of the most commonly referenced advisory circulars are:

- 150/5100-14: Architectural, Engineering and Planning Consultant Services for Airport Grant Projects
- 150/5340-1: Standards for Airport Markings

- 150/5340-30: Design and Installation Details for Airport Visual Aids
- 150/5300-13: Airport Design
- 150/5370-10: Standards for Specifying Construction of Airports

FAA updates to an advisory circular can occur through either a change to or a reissuing of the advisory circular. A change is limited to specific pages and identifies the page(s) that is(are) changed. A reissuance indicates a larger overall modification to the guidance. When an advisory circular is referenced, there will be an indication of any changes after the circular's number. When an advisory circular is reissued, an alphabetical letter is added or changed at the end of the circular's number. For example, Advisory Circular 150/5300-13A, Change 1, indicates that there has been one reissuance of the advisory circular and one change since its issuance that affected specific pages.

Throughout this guidebook, the FAA advisory circulars and orders have been referenced by number, only omitting any update letters. The most recent edition of the advisory circular or order, with any changes, should always be referenced. The most recent editions are available on the FAA's website.

## FAA Orders

FAA orders are written guidance to FAA staff to implement the FAA programs. The orders are also useful to airports to identify the requirements FAA staff must meet in working with your airport. The following are some of the most commonly used FAA orders for airports:

- Order 1050.1: Environmental Impacts: Policies and Procedures
- Order 5100.38: Airport Improvement Program Handbook
- Order 5190.6: FAA Airport Compliance Manual
- Order 5050.4: National Environmental Policy Act (NEPA) Implementing Instructions for Airport Actions

## Other Resources

### *Other FAA Resources*

The FAA also issues guidance in the form of program guidance letters, engineering briefs and Part 139 CertAlerts to augment information in the advisory circulars. All FAA resources are available on its website, www.faa.gov. In addition, the FAA's website serves as a portal to submit requests to the FAA, such as to initiate an airspace study.

### *ACRP Resources*

Sponsored by the FAA and administered through the Transportation Research Board, part of the National Academies of Sciences, Engineering, and Medicine, ACRP is an industry-driven, applied research program to develop near-term, practical solutions to problems faced by airport operators. ACRP was established as part of the Vision 100 – Century of Aviation Reauthorization Act of 2003. According to the *ACRP 2017 Annual Report of Progress*, from 2005 to 2017, ACRP funded 555 projects, and the research continues, with more resource documents being published as projects are completed. The most commonly referenced ACRP products for airport management practices are:

- **ACRP Research Reports**, which are developed from research projects and may be accompanied by associated tools developed during the project.
- **ACRP Syntheses of Airport Practice**, which are reports that synthesize current knowledge and practice, without the detailed direction usually found in handbooks or design manuals.

- **ACRP Legal Research Digests**, which report on legal topics of special interest to the airport legal community.
- **ACRP WebResources**, which are websites that may include topical libraries, training videos, and other resources related to a research project.

Some of the ACRP research projects also result in Web-Only Documents or have provided CDs with interactive tools. *ACRP WebResource 6* is a companion to this report and provides an electronic library of resources for managers of small airports.

### *State Aeronautics Agency Publications*

A state aeronautics or aviation agency is generally part of a state's department of transportation. State aeronautics agencies may be the most direct link to a small airport and are a great resource for small airports to use to identify state-specific airport requirements or processes. States and local units of government may have their own rules and regulations applicable to airports. These may cover stormwater runoff and wetland protection, zoning, labor requirements and wage rates, working hours, product use, noise ordinances and other issues. Some states require airports, other than FAR Part 139-certificated airports, to have a license to operate and meet certain safety and security standards to obtain the operating license or permit.

State aviation agencies typically work with local airports to educate them about state rules and regulations. State airport conferences can also be a valuable tool for learning about current requirements and for communicating with other airport managers about recommendations for meeting those standards. Because each state has different requirements, this guidebook focuses only on national requirements or issues. Contacting the state aeronautics agency is a good first step for a small airport to become acquainted with state-specific requirements and resources.

Most of the state aviation agencies provide some resources on their websites, ranging from state aviation system plans to templates for best practices and guidance documents. While each state aeronautics website focuses first on information on and for airports in their state, many also provide information that can be useful to airport managers in other states. Larger states and those with more airports tend to have more resources available, which when used appropriately can have applicability even outside the state. Some examples of state resources include the following:

- Florida Department of Transportation, Aviation and Spaceports Office has numerous resource documents available on its website.
- Texas Department of Transportation (TxDOT), Aviation Division provides model documents on its TxDOT Airport Rules and Standards web page to assist airport managers.
- Pennsylvania Department of Transportation, Bureau of Aviation has a number of resources available for airport managers on its website and published an Airport Manager's Safety Handbook that contains similar information to the guidebook in an abbreviated format.
- Georgia Department of Transportation, Aviation has a Sample Forms Tab on its website with sample documents to assist airport managers. Some of this reference information is linked to other resources.
- Wisconsin Department of Transportation, Bureau of Aeronautics also provides numerous templates and the sample documents on its Airport Operations page.

A relationship with the state aeronautics agency is even more critical in 10 states that are part of the FAA's State Block Grant Program. Under the program, the state is responsible for programming the monies allocated for the AIP for nonprimary airports. As of 2017, the states participating in the FAA's State Block Grant Program are Georgia, Illinois, Michigan, Missouri, New Hampshire, North Carolina, Pennsylvania, Tennessee, Texas and Wisconsin.

Using the National Organization of State Aviation Officials members' web page is a quick way to identify the primary contact in a state aeronautics agency and agency's website.

### *Resource Networks*

The industry survey responses received by the research team stressed the importance of building a resource network. This resource network can be composed of other small airport managers, state and federal aviation agency personnel and other people associated with the aviation industry. Because many small airports have very limited staff, this network can serve as a resource on current issues and as a sounding board for best practices for the small airport manager.

Resource networks are generally built through involvement in the aviation industry, such as with state aviation associations and getting to know your state aeronautics agency and FAA Airports district office (ADO) program manager. In addition to serving as a resource, the state aeronautics agency and FAA personnel that understand your airport and its needs can also serve as champions for your airport in the grant funding programming process.

Resource networks may also be available for specific interests within aviation such as the Recreational Aviation Foundation, which focuses on airstrips that provide access to recreational areas.

### *Internet Search*

ACRP guidebooks, and even web resources, by their very nature are static. *ACRP Report 16*, 2nd edition and *ACRP WebResource 6* represent the collective knowledge at the point in time they were completed. The dynamic aviation industry will continue to change and evolve. Therefore, to augment the information in the guidebook and web resource, additional information can be sought via an internet search. Whenever using the internet, appropriate caution should be used to ensure the documents are current and that the guidance is authentic. The landing pages in *ACRP WebResource 6* are designed to assist you in searching for future updated editions of referenced documents.

Internet searches can be beneficial—just stay aware of the source of the document and its date, so you are using current, reputable information.

## Summary

*ACRP Research Report 16*, 2nd edition and *ACRP WebResource 6* are designed to work in concert to provide you, the small airport manager, with self-help guidance and tools to address the multiple requirements of managing small airports. You can download the guidebook from the TRB website (www.trb.org) and use the hyperlinks to access the additional resources and tools in *ACRP WebResource 6*. Consult *ACRP Report 16*, 2nd edition and *ACRP WebResource 6* when encountering new issues or for additional ideas to aid in addressing existing challenges.

CHAPTER 2

# Airport Roles—Key Classifications and Regulations in the Airport System

Icons are defined in Figure 1 of Section 1.1.

## 2.1 Airport Classification and Why It Matters

### Key Insights

*All airports have value to the communities they serve.*

*The role of the airport in the national, state or local aviation system impacts the financial support an airport is eligible to receive and the standards the facilities and operations must meet.*

*The types of users at an airport influence its role.*

### Key Definitions

**Airport economic impact**: The contribution of an airport to the regional economy, quantified in terms of employment, payroll and output.

**Federal Aviation Regulations (FAR) Part 139**: Airports that agree to meet certain operational and safety standards as prescribed in 14 CFR Part 139, also referred to as FAR Part 139, to accommodate scheduled and unscheduled air carrier aircraft and are issued an operating certificate by the FAA. Types of Part 139 airports:

- *Class I airport*: An airport certificated to serve scheduled operations of large air carrier aircraft that can also serve unscheduled passenger operations of large air carrier aircraft and/or scheduled operations of small air carrier aircraft.
- *Class II airport*: An airport certificated to serve scheduled operations of small air carrier aircraft and the unscheduled passenger operations of large air carrier aircraft. A Class II airport cannot serve scheduled large air carrier aircraft.
- *Class III airport*: An airport certificated to serve scheduled operations of small air carrier aircraft. A Class III airport cannot serve scheduled or unscheduled large air carrier aircraft.
- *Class IV airport*: An airport certificated to serve unscheduled passenger operations of large air carrier aircraft. A Class IV airport cannot serve scheduled large or small air carrier aircraft.

**Federal grant assurance**: A provision of a federal grant agreement to which the recipient of federal airport development assistance has agreed to comply.

**General aviation (GA)**: All civil aviation (excluding military) except those classified as air carrier or air taxi. The types of aircraft typically used in GA activities vary from multiengine

jet aircraft to single-engine piston aircraft for purposes such as personal, business and instructional flying.

**General aviation airport**: Airport not classified as commercial service or military.

**National Plan of Integrated Airport Systems (NPIAS)**: Public-use airports considered necessary to provide a safe, efficient and integrated system of airports to meet the needs of the United States civil aviation, national defense and the U.S. Postal Service.

**Nonhub commercial service airport**: Airport with more than 2,500 annual passenger boardings (enplanements) but less than 0.05 percent of the national passenger boardings.

**Nonprimary commercial service airports**: Airports with scheduled passenger service and annual passenger boardings (enplanements) between 2,500 and 10,000.

**Primary airport**: Publicly owned airport with scheduled air carrier service and more than 10,000 passenger boardings (enplanements) per year.

**Public-use airport**: Airport available for public use; may be publicly or privately owned.

**Public airport**: Any airport that is used or to be used for public purposes, in the control of a public agency, the land area of which is publicly owned.

**Reliever airports**: General aviation airports in metropolitan areas that provide pilots with an alternative to using congested commercial service airports or provide general aviation access to the surrounding area.

**State Block Grant Program**: An FAA program, in which 10 states participate, that provides Airport Improvement Program funds to the state to allow the state to program, prioritize, select and fund Airport Improvement Program projects at small airports.

**State system plan**: A planning tool to identify the development needed to establish a viable system of airports within the state.

## Airport Functions

All airports benefit the communities they serve by attracting business, supporting aviation-related businesses, providing access to the national and international airspace systems and serving individual needs. While commercial service airports have the most visible benefit to a community, all airports provide access to the national air transportation system and support a wide range of uses and businesses, as discussed in the FAA's General Aviation Airports: A National Asset. Figure 4 summarizes many of the aeronautical functions at a GA airport that serve public interest.

The industry outreach portion of this study also identified aeronautical functions at small airports, as shown in Figure 5. The "other" category included aircraft painting, civil air patrol, agricultural application businesses, rental car agencies, universities and university athletic departments. One way an airport quantifies its value to a community is through the use of economic impact analysis, as discussed in Section 6.5: Economic Impact. An economic impact analysis is commonly used to estimate a dollar value for the services provided by an airport. The results of such a study can be used to generate financial and community support for the airport.

## Federal Versus State/Local Control


Airports are locally owned, but regulated by federal standards, state standards or both. Air carrier operating certificates are issued to FAR Part 139 airports by the FAA. In addition to

| | | |
|---|---|---|
| **Emergency Preparedness and Response** | ▪ Aeromedical Flights<br>▪ Law Enforcement/National Security/Border Security<br>▪ Emergency Response<br>▪ Aerial Fire Fighting Support<br>▪ Emergency Diversionary Airport<br>▪ Disaster Relief and Search and Rescue<br>▪ Critical Federal Functions |  |
| **Critical Community Access** | ▪ Remote Population/Island Access<br>▪ Air Taxi/Charter Services<br>▪ Essential Scheduled Air Service Cargo |  |
| **Other Aviation-Specific Functions** | ▪ Self-Piloted Business Flights<br>▪ Corporate<br>▪ Flight Instruction<br>▪ Personal Flying<br>▪ Charter Passenger Services<br>▪ Aircraft/Avionics Manufacturing/Maintenance<br>▪ Aircraft Storage<br>▪ Aerospace Engineering/Research |  |
| **Commercial, Industrial, and Economic Activities** | ▪ Agricultural Support<br>▪ Aerial Surveying and Observation<br>▪ Low-Orbit Space Launch and Landing<br>▪ Oil and Mineral Exploration/Survey<br>▪ Utility/Pipeline Control and Inspection<br>▪ Business Executive Flight Service<br>▪ Manufacturing and Distribution<br>▪ Express Delivery Service<br>▪ Air Cargo |  |
| **Destination and Special Events** | ▪ Tourism and Access to Special Events<br>▪ Intermodal Connections (rail/ship)<br>▪ Special Aeronautical (skydiving/airshows) |  |

Source: General Aviation Airports: A National Asset, FAA, 2012

***Figure 4. Types of aeronautical functions serving public interest at GA airports.***

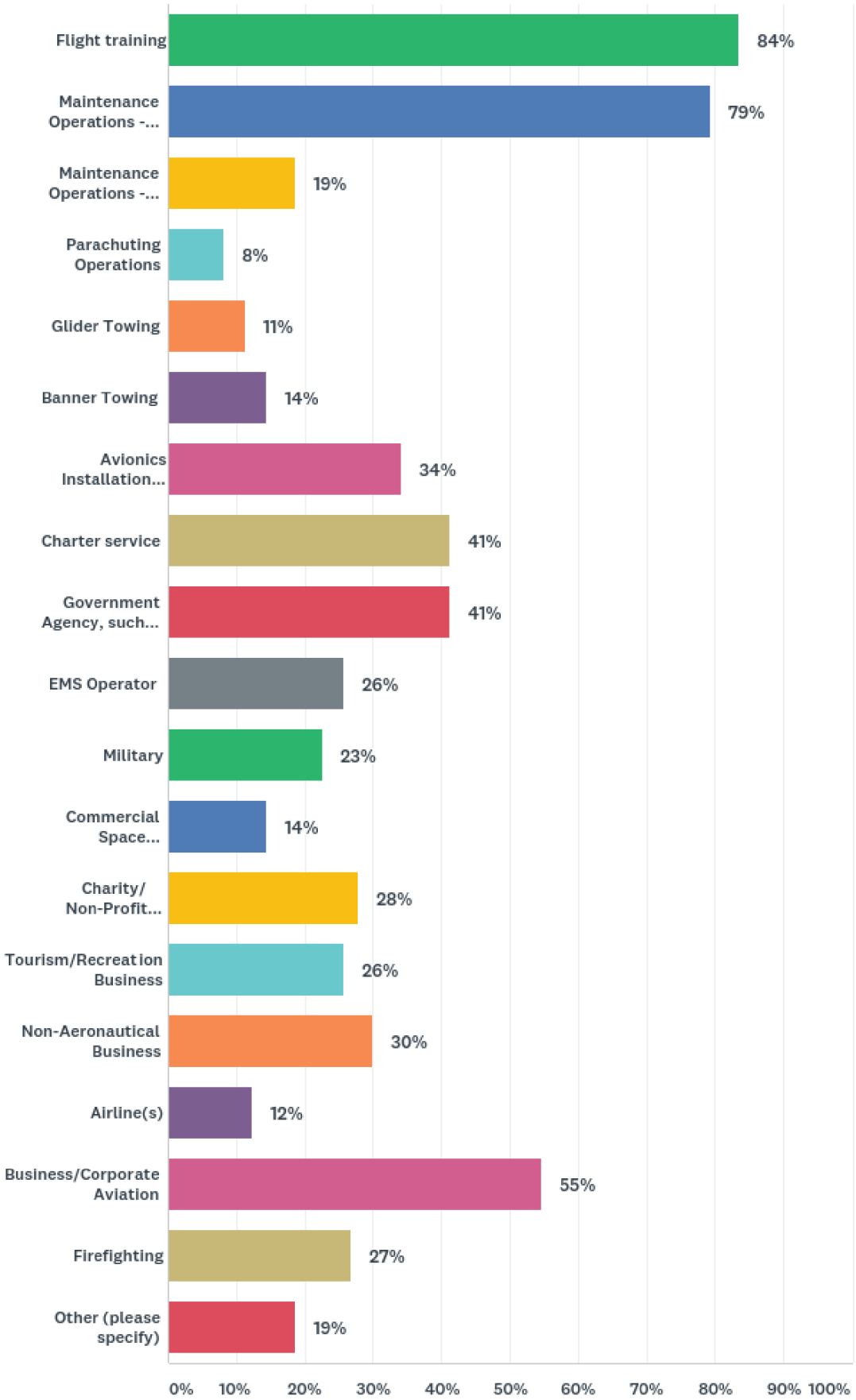
the FAA certificate, a state may issue an operating certificate based on an FAR Part 139 airport's compliance with that program. All other airports available for public use typically receive operating licenses or certificates from their state aeronautics agencies, if the state issues licenses or certificates. Table 2 summarizes the control of aviation activity that occurs at the federal level and those at the state or local level.

The FAA annually inspects and certificates only those airports operating under FAR Part 139. All other public-use airports in the NPIAS must be inspected every 3 years. This inspection is accomplished via the Airport Master Record, or 5010 program. The inspection of non-FAR Part 139 airports is delegated to the states. The state's aeronautics staff may conduct the inspections, or they may be subcontracted to a private contractor. In addition, states may also inspect other non-NPIAS public-use airports.

For non-Part 139 airports, some states establish their own airport licensing standards and inspection processes. However, state-licensed airports still need to meet federal design standards, if requesting federal grants under the AIP.

In addition to the FAA's regulatory roles in civil aviation and U.S. commercial space transportation, its responsibilities include promotion of civil aviation and commercial space transportation, and the safety of civil aviation and airspace. The FAA's major nonregulatory roles are as follows:

- Encouraging and developing civil aeronautics, including new aviation technology
- Developing and operating a system of air traffic control and navigation for civil and military aircraft




"Other" category includes aircraft painting, civil air patrol, agricultural application businesses, rental car agencies, universities and university athletic departments.

Of the 102 airports that responded to the industry outreach survey performed for ACRP 01-32, 97 completed this question.

***Figure 5. Percentage of responding airports hosting businesses, governmental entities and other aeronautical functions.***

**Table 2. Federal versus state/local control of aviation activity.**

| Federal Control | State and Local Control |
|---|---|
| Navigable airspace (exclusive control) | Airport ordinances and resolutions |
| Aircraft, pilot and airport certification (Part 139) | Zoning and land use |
| Aircraft noise standards | Building codes |
| Regulation of airports | Rules and regulations |
| Regulation of pilots and aircraft | Minimum standards |
| Noise abatement and mitigation | Taxes and impact fees |

Source: *ACRP Report 58: Airport Industry Familiarization and Training for Part-Time Airport Policy Makers*, 2011

- Researching and developing the NAS and civil aeronautics
- Developing and carrying out programs to control aircraft noise and other environmental effects of civil aviation

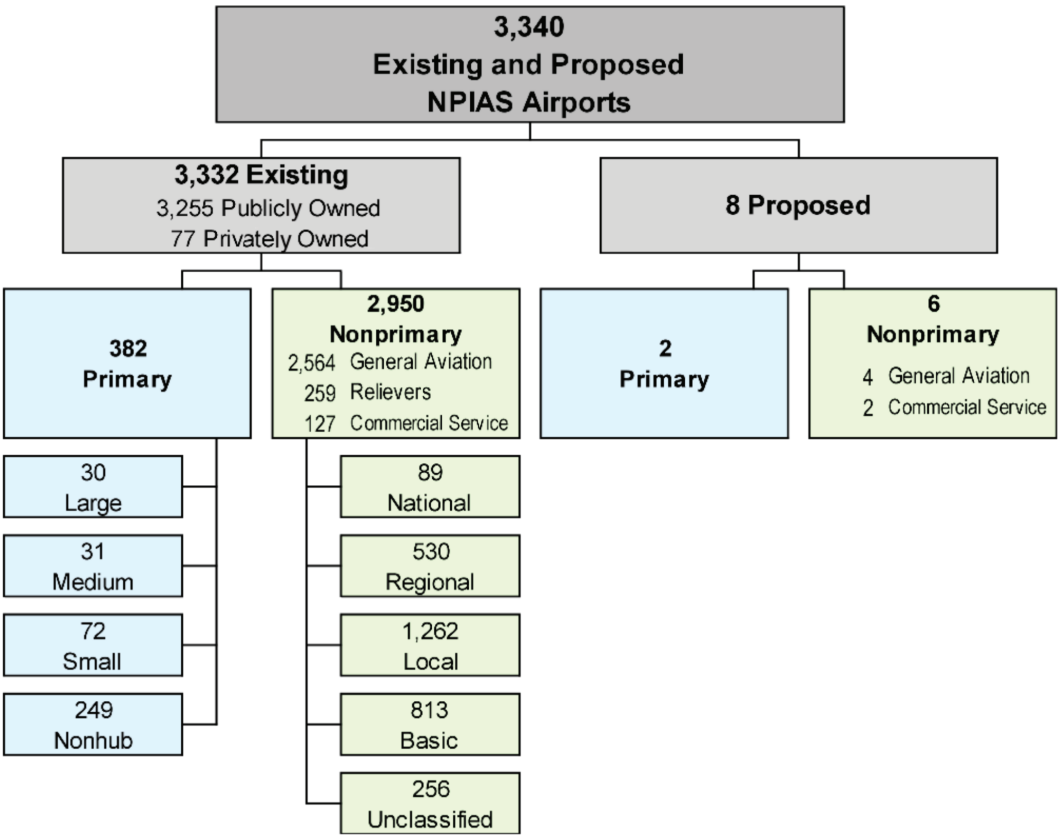
## Airport Systems

The FAA uses various classifications to group airports based on the type and volume of activity at an airport. The first breakout is between primary (commercial service airport with more than 10,000 enplanements per year) and nonprimary (all other airports in the NPIAS). While classification does not change the value of an airport to a community, it is important when it comes to grant assistance for capital projects, as well as the design and operating standards an airport must meet. Within the nonprimary class, the FAA divides airports into reliever and GA, with GA being further divided into four categories.

### *National Plan of Integrated Airport Systems*

NPIAS is a national system plan of nearly 3,400 existing and proposed airports that are significant to the national air transportation system, as shown in Figure 6. **These airports are also eligible to receive federal grant funds**, as long as they are in compliance with their grant assurances and property deed restrictions. As part of the NPIAS, the FAA is required to provide Congress with a five-year estimate of AIP-eligible development and is required to update the plan every 2 years. There are eight guiding principles for the national airport system:

- Airports should be safe and efficient, located where people will use them and developed and maintained to appropriate standards.
- Airports should be affordable to users and the government, relying primarily on producing a self-sustaining revenue stream and planning for minimal burden on the general revenues of the local, state and federal governments.
- Airports should be flexible, expandable and able to meet increased demand and accommodate new aircraft types.
- Airports should be permanent, with assurance that they will remain open for aeronautical use over the long term.
- Airports should be compatible with surrounding communities, maintaining a balance between the needs of aviation, the environment and the requirements of residents.
- Airports should be developed in concert with improvements to the air traffic control system and technological advancements.
- The airport system should support a variety of critical national objectives, such as defense, emergency readiness, law enforcement and postal delivery.
- The airport system should be extensive, providing as many people as possible with convenient access to air transportation, typically by having most of the population within 20 miles of an NPIAS airport.




Source: National Plan of Integrated Airport Systems (2017–21)

***Figure 6. NPIAS airports by category and role.***

In addition, a guiding principle for federal infrastructure investments is that federal investments should be cost-beneficial.

The FAA also conducted a more in-depth study of general airports, resulting in two reports: *General Aviation Airports: A National Asset (ASSET 1) and ASSET 2: In-Depth Review of 497 Unclassified Airports*. The studies highlighted the important role GA airports play in our society, economy and aviation system. The FAA also grouped GA airports into four categories–national, regional, local, and basic–based on their existing activity levels (see Table 3).

It is important for an unclassified airport to contact its FAA ADO.

In the first study, a number of airports (which includes heliports and sea plane bases) were unclassified. The ASSET 2 study focused on these 497 airports. Through this study, 212 airports were identified to meet the criteria for inclusion as a regional, local or basic airport. Of the 281 airports that remain unclassified, 227 are publicly owned, with little or no activity; 19 are privately owned relievers that do not meet the minimum activity levels for continued designation as a reliever; and 35 do not meet the requirements for inclusion in the NPIAS, because they are privately owned GA airports. These airports remain unclassified in the NPIAS but have the opportunity to move into one of the four categories upon reaching the established thresholds. Another four are closed or inactive and were removed from the NPIAS.

### *State Airport System Plans*

State aeronautics agencies develop their own state airport system plans. A state airport system plan includes (1) airports within the state that are part of the NPIAS and (2) non-NPIAS GA

**Table 3. ASSET 1 general aviation airport categories and criteria.**

| National | Regional | Local | Basic |
|---|---|---|---|
| Supports the national and state system by providing communities with access to national and international markets in multiple states and throughout the United States. | Supports regional economies by connecting communities to statewide and interstate markets. | Supplements communities by providing access to primarily intrastate and some interstate markets. | Links the community with national airport system and supports general aviation activities (e.g., emergency services, charter or critical passenger service, cargo operations, flight training, and personal flying). |
| Airports in this category have:<br>• 5,000 or more Annual Instrument operations,<br>• And 11 or more Based Jets,<br>• And Annual International Flights of 20+ or Interstate Departures of 500+;<br>• OR at least 10,000 annual enplanements and charter passengers service of large certificated air carriers;<br>• OR 500 million pounds of Cargo Landed Weight. | Airports in this category have:<br>• MSA (Metro or Micro),<br>• And 10 Annual domestic flights over 500 miles,<br>• And 1,000 Annual Instrument Operations,<br>• And 1 based jet or 100 or more based aircraft;<br>• OR are Nonprimary CS within MSA – usually not scheduled service but aircraft for hire. | Airports in this category have:<br>• 10 or more Annual Instrument operations,<br>• And 15 or more based aircraft;<br>• OR Annual passenger boardings of 2,500 or more – usually not scheduled service but charter. | Airports in this category have:<br>• 10 or more based aircraft (airports);<br>• OR 4 based helicopters (heliports);<br>• OR 30 or more miles from the nearest NPIAS airport;<br>• OR Critical Community Service Provided by a Federal Service such as: Forest Service, Marshals, Postal Service (Air Stop), Customs/Border Protection, U.S. DOT Essential Air Service;<br>• OR is a new airport or replacement facility activated after January 1, 2001. |
| *An airport must currently be eligible for Federal funding.* | | | |
| 497 NPIAS airports were not categorized. As a group, they have different activity levels and characteristics and cannot be described in their own unique category. | | | |

Source: FAA *ASSET 2*, 2014

airports that are important to the state aviation system. Inclusion in a state system plan is one of the requirements for GA airports to be considered for inclusion in the NPIAS.

The primary purpose of a state airport system plan is to study the performance and interaction of the airports in the state aviation system. When the state airport system is defined, it may also include some cross-state border airports that serve the needs of the state. The state airport system plan examines the current system, air transportation needs and forecast demands, airport roles and recommended system changes and includes an implementation plan. The state airport system plan should be consistent with state and regional goals for transportation, land use and the environment. FAA Advisory Circular 150/5070-7: The Airport System Planning Process contains guidance on the development of state airport system plans.

States also may establish licensing requirements for public-use airports not certificated under FAR Part 139. Each state establishes its own licensing requirements, if any, which may be less restrictive than FAA requirements. For any small airports receiving federal grants (federally obligated), the FAA standards still must be met as part of the grant obligations.

### Non-NPIAS Airports

For public-use airports that are not federally obligated, any applicable state licensing standards are the required minimum standards. The FAA guidance may also be consulted, but in this case it is truly advisory is nature. States may also have minimum requirements for the establishment of private-use airports. The best source for state airport licensing requirements is the state aeronautics agency.

This guidebook's definition of "small airport" encompasses almost 3,200 NPIAS existing airports in the classes of nonhub primary (249 airports), commercial service (127 airports), reliever (259 airports) and GA (2,564 airports). However, this guidebook is intended to serve more than just NPIAS airports, because many small airports are not in the NPIAS but may be part of a state airport system or serve a local need such as an airfield that provides access to recreational areas.

### Summary of Airport Systems

Table 4 shows the characteristics of the airports that fall under the various airport system plans.

### Airport Ownership and Governance

While regulated at a federal and/or state level, airports are generally locally owned. The most common ownership of an airport is by a public entity. Public ownership is typically by a city, county, airport authority, port authority or other governmental entity. *ACRP Legal Research Digest 7: Airport Governance and Ownership* defines what airport governance includes and the advantages and disadvantages of the various governance structures. *ACRP Legal Research Digest 24: Sovereign Immunity for Public Airport Operations* examines sovereign immunity as it applies to public airports that are owned and operated by units of local government or regional governmental authorities. Public-use airports can also be owned by private entities. A few public-use airports are also owned by state governments.

The type of ownership plays a role in the financial support of the airport. Factors that affect the financial support are whether the owner is an independent entity or part of another larger governmental agency. Some independent governmental entities also have their own taxing authorities that can raise revenue to be dedicated to the airport, whereas when a part of a larger governmental entity, the airport is just one line item within a much larger budget. The state airport-authorizing legislation can also affect airport operations and finances. *ACRP Legal*

**Table 4. Characteristics of airports covered by airport system plans.**

| Characteristic | NPIAS: Primary | NPIAS: Nonprimary | State System Plan | Non-System Plan (Public Use) |
|---|---|---|---|---|
| Certification/ License | FAR Part 139 | FAR Part 139 or state license if state issues | State license if state issues | State license if state issues |
| Funding Source(s) | AIP (primary entitlement at least $1 million per year) and discretionary, state grants, local funding | AIP (nonprimary entitlement up to $150,00 per year), discretionary and state apportionment, state grants, local funding | State grants, local funding | Typically local funding only, may be privately owned with only private funding |
| Common Users | Airlines, charter, general aviation, military | Airlines (commercial service), charter, general aviation, military | General aviation | General aviation |

NPIAS airports are also included in state system plans, but the certification requirements are due to inclusion in the NPIAS control.

*Research Digest 15: Compilation of State Airport-Authorizing Legislation* presents information on each state's airport-specific legislation.

Airport managers who work with policymaking boards that have representatives from multiple jurisdictions, or who operate an airport owned by one entity and surrounded by other government jurisdictions, can face additional challenges. These challenges tend to arise when the entities do not have a common goal or are reporting to constituents with varying goals and expectations.

When working with representatives from multiple jurisdictions, having defined goals for the airport and clearly communicating the goals, along with the value of the airport to the community, may assist in addressing concerns. One way to do this is to maximize the opportunity for community input during the planning process, with the goal of obtaining buy-in for long-term plans. Listening to understand the constituency and the concerns represented by each entity is also important. Along with listening, it is important for you or the airport owner to communicate what is and is not within your or the owner's ability to control. For example, public airports that have accepted grants must be available to all aeronautical uses; therefore, the airport owner is not able to restrict classes of users or the times they may use the airport. Continually capitalizing on opportunities to demonstrate the value of the airport to each of the community stakeholders will also help generate support for the airport.

Keep reporting to a governing body simple and transparent.

The role of the governing body is generally that of a policymaker, whereas the airport manager generally has the role of overseeing the activities and implementing the policy guidance. Table 5 summarizes the roles of the governing body/policymaker and airport management.

To communicate well with the airport's governing body/policymaker (board), you should be familiar with the organization of the board, including the enabling legislation or ordinances that allowed for the creation of the board and the authority granted to the board. As a key staff member to the board, you should be familiar with any administrative expectations, such as scheduling meetings, issuing public notices of meetings, establishing the meeting agenda, taking and producing meeting minutes, etc. At some airports, the board members may take on additional responsibilities to assist with operating the airport. You should be familiar with any assistance they provide and related expectations. When there is a vacancy on the board, you may be asked by the appointing body for suggestions on potential replacements and likely will be expected to familiarize the new board member with the airport. *ACRP Report 58* is a tool to familiarize a new board member with the airport and its operations. The board members are important airport stakeholders. Good communication with the board members is essential, as addressed in Stakeholder Engagement.

**Table 5. Roles and responsibilities of governing body and airport management.**

| Governing Body/Policymaker | Airport Manager/Management |
|---|---|
| Establishes policy | Implements policy |
| Establishes vision | Reports to the governing body |
| Sets goals | Runs the airport day to day |
| Identifies strategies for fulling the vision | Operates the airport safely and efficiently |
| Executes contracts or delegates to manager | Maintains the airport and its facilities |
| Accepts grants | Prepares financial plans |
| Serves as airport advocate | Oversees public relations |
| Approves plan and programs | Makes provisions for the passengers and the public |
| Selects consultants and service providers | Recommends and enforces rules and regulations |
| Oversees the airport manager's responsibilities | Oversees planning and construction projects |
| | Secures new business |

Source: *ACRP Report 58: Airport Industry Familiarization and Training for Part-Time Airport Policy Makers*, 2011

## 2.2 Key Types of Regulations for Airport Management

### Key Insights

*Multiple federal departments, agencies and offices have promulgated federal regulations related to planning, development, operation and management of an airport that has accepted federal AIP grant funding.*

*When an airport accepts AIP grant funding, the advisory circulars and orders provide a manner approved by the administrator to comply with regulations.*

### Key Definitions

**Executive orders**: Directives from the president of the United States to officers and agencies of the executive branch that have the full force of law for management of agency operations.

**Regulations**: Rules issued by the executive branch departments and agencies of the federal government and codified in the Code of Federal Regulations.

**Statutes**: Laws enacted by Congress; statutes with continuing effects are generally codified in the United States Code.

### Federal Regulations

When accepting federal grants and becoming a federally obligated airport, the airport sponsor needs to meet not only the grant assurances, but the other federal regulations associated with the grant assurances. *ACRP Report 156: Guidebook for Managing Compliance with Federal Regulations: An Integrated Approach* identified 16 federal departments, agencies and offices, in addition to the FAA, with rules pertaining to airports that have accepted federal funds.

At small airports, regulations from only some of these agencies will be applicable in day-to-day operations. Others will be primarily applicable when considering potential environmental impacts, and others primarily apply at airports with commercial operations, international operations or both. *ACRP Report 156* provides a regulation compliance management tool (RCMT) to assist an airport in identifying applicable regulations. It also provides a compliance management tool to help airports maintain compliance. *ACRP Legal Research Digest 9: Case Studies on Community Challenges to Airport Development* explores some challenges to airport development that used regulations, especially environmental regulations.

While multiple regulations affect airport operations, some, such as the following, are used more often by small airports:

- CFR Title 14, Federal Aviation Regulations
- NEPA and associated environmental regulations
- 49 CFR Chapter XII, Transportation Security Administration, as applicable to civil aviation security
- State and local regulations in some cases—such as the control of tall structures near an airport—provide the enforcement tool for the federal regulations that do not include any enforcement authority

This and the following section provide an overview of regulations. More details are provided regarding the regulatory environment and its application to the management of small airports in the applicable topic sections throughout this report.

**16 FEDERAL AGENCIES WITH REGULATIONS APPLICABLE TO FEDERALLY OBLIGATED AIRPORTS**

- Customs and Border Protection (CBP)
- Department of Agriculture (USDA)
- Department of Defense (DoD)
- Department of Homeland Security (DHS)
- Department of Housing and Urban Development (HUD)
- Department of the Interior (DOI)
- Department of Justice (DOJ)
- Department of Labor (DOL)
- Department of Transportation (DOT)
- Environmental Protection Agency (EPA)
- Federal Communications Commission (FCC)
- General Services Administration (GSA)
- Immigration and Customs Enforcement (ICE)
- Occupational Safety and Health Administration (OSHA)
- Office of Management and Budget (OMB)
- Transportation Security Administration (TSA)

Source: *ACRP Report 156: Guidebook for Managing Compliance with Federal Regulations: An Integrated Approach*, 2016

The FAA ensures compliance with these applicable federal regulations through the use of grant assurances. When an airport sponsor accepts federal AIP grant funding, the sponsor must commit to abiding by all the FAA grant assurances. The FAA grant assurances become a binding contract for the airport for the life of that asset or land. The grant assurances align with the authorization requirements of the AIP grant program. Therefore, the FAA needs to periodically update the published grant assurances when Congress makes changes to the AIP grant program. Currently, there are 39 grant assurances.

For the purposes of grant assurances, the useful life of facilities developed or equipment acquired for an airport development or noise-compatibility program is not to exceed 20 years. There is no limit on exclusive rights and airport revenue grant assurances, as long as the airport remains open and is used as an airport. There is also no time limit, with respect to real property acquired with federal funds under the AIP. Real property acquired with federal funds during prior federal grant programs, such as the Federal-Aid Airport Program and Airport Development Aid Program, may have different rules. You should coordinate with your FAA ADO regarding questions related to land purchased under an earlier grant program.

The FAA provides a web page to identify the required federal provisions for airport contract documents. This website includes language that can be used in contracts to meet the required contract provisions for AIP. Some provisions, particularly the civil rights provision that precludes discrimination in the award of the contract, apply to a sponsor that has previously accepted a federal grant, even if the procurement in question does not intend to use federal funding.

## State and Local Regulations

Each state and/or local community can also issue regulations that affect small airport operations and management. The best resource to identify the pertinent regulations is your state aeronautics agency and the entity, or entities, that appoint your airport policymaking board. The most common state regulations are ones that deal with the following:

- Airport ownership structure
- Airport funding (taxation and bonding)
- Airport site/operating certifications
- Airspace/tall structures control
- Land-use compatibility/zoning—usually designates control to local level
- State aviation funding programs

Some states may also cover aircraft registration, pilot registration or both. Although pilot licensing and aircraft registration is accomplished through the FAA, some states also require pilots to register themselves, their aircraft or both at the state level.

## Property Tax

Property tax on aviation activities is established at a state level. Some states do not authorize taxes at an airport, and some may simply exclude aeronautical development on an airport from property tax. State regulations also dictate how personal property is taxed. Competitive tax rates can have a market impact for some small airports located near state boundaries. In this case, the taxing structure can make your airport more or less attractive to users based on your location. Because tax exclusion regulations vary by state, to determine if your airport property may be eligible for partial or complete tax exemption, your local tax authorities should always be consulted. Local tax assessors have some leeway in how they view the ad valorem tax (amount based on their valuation) requirements, particularly for aeronautical business activities at each individual airport.

CHAPTER 3

# Business—Financial and Administrative Management

Icons are defined in Figure 1 of Section 1.1.

Financial and administrative management are key functions of small airport management. Airports should strive to be as self-sustaining as possible through revenue generation and good fiscal management of expenditures through budgeting. Appropriate lease documents, establishment of rates and charges, maximizing grant funding, if eligible, and minimizing risk through insurance are also important fiscal management tools. When a small airport has multiple employees, the small airport manager may also have human resources-related management responsibilities.

## 3.1 Revenue Generation and Use

### Key Insights

*The FAA defines airport revenues and their allowable uses. It is important for the airport manager of a federally obligated airport (one that has accepted a federal grant) to understand what airport revenue is and how it can be spent.*

*FAA grant assurances require an airport to be as self-sustaining as possible. Airport grant funding is intended to assist an airport toward self-sufficiency. Diversion of airport revenue away from the airport for nonaviation use jeopardizes that goal.*

*It is the airport sponsor's responsibility to develop and maintain a clear accounting system of all revenue generated at the airport and all fees paid by the airport to a local governmental entity and all services received for those fees.*

*Even if an airport does not receive federal funds, many state aviation grants include similar provisions that prohibit revenue diversion.*

### Key Definitions

**Airport property**: Any property described as part of an airport in an agreement with the United States or defined by an airport layout plan or listed in an Exhibit "A" property map is considered to be obligated property for airport purposes.

**Airport revenue**: All fees, charges, rents or other payments received by the sponsor for use of the airport property and services; sale, transfer or disposition of airport real property; sale or lease of sponsor-owned mineral, natural or agricultural products or water taken from

the airport; revenue from sponsor activities on the airport; and state or local aviation fuel taxes, except taxes in effect on December 30, 1987.

**Fair market value (FMV)**: An estimate of the market value of a property, based on what a knowledgeable, willing and unpressured buyer would probably pay to a knowledgeable, willing and unpressured seller in the market.

**Federal grant assurance**: A provision of a federal grant agreement to which the recipient of federal airport development assistance has agreed to comply.

**Revenue diversion**: Use of airport revenue for nonaeronautical uses or for payments in excess of stated tax rates or the value of services received.

## Airport Revenue Generation and Use

It is common for small airport managers to need to educate their policy board or local elected leaders about the restriction on the use of airport revenues.

One of the challenges in managing an airport is generating the revenue needed to sustainably operate and improve the airport. In addition, it is imperative that revenue diversion (using airport revenue for nonapproved uses) is avoided at a federally obligated airport, which is an airport that has accepted federal grants. When planning the financial operation of an airport, it is important to recognize what airport revenue is (see the text box on Grant Assurance 25), what uses of airport revenue are appropriate and what would constitute revenue diversion.

To help airport sponsors strive to be as self-sustaining as possible, the FAA has defined airport revenue and its allowable uses. For example, in addition to paying operating expenses incurred at the airport, an airport can pay for services from its local community—such as legal or security—but the value of the services must align with the fees that are charged. *ACRP Legal Research Digest 2: Theory and Law of Revenue Diversion* explores the issue of revenue diversion and how the prohibition against revenue diversion has been enforced.

## Airport Revenue Sources

The first step in managing airport revenue and avoiding revenue diversion is to understand what the FAA classifies as airport revenue. Common airport revenue sources include revenue from operations directly related to the operation of aircraft, such as terminal and hangar rents, tie-down rents, fuel flowage fees, fuel sales, local taxes on aviation fuel, landing fees, terminal concessions and land leases.

## Allowable Uses of Airport Revenue

The FAA defines allowable uses for airport revenue:

- Capital and operating expenses of the airport, local airport system, or other local facilities owned or operated by the airport owner or operator and directly and substantially related to air transportation of passengers or property
- Activities directed toward promoting competition at an airport, including public and industry awareness of airport facilities and services, new air service and competition at an airport (other than the direct subsidy of air carrier operations) and the salaries and expenses of employees engaged in promoting air service at the airport
- A share of promotional expenses, which may include marketing efforts, advertising and related activities designed to increase the use of the airport
- Repayment of the airport owner's or operator's contribution to capital and operating costs. If the contribution was a clearly documented loan, interest may be paid.

**Grant Assurance 25: Airport Revenues**

a. All revenues generated by the airport and any local taxes on aviation fuel established after December 30, 1987, will be expended by it for the capital or operating costs of the airport; the local airport system; or other local facilities which are owned or operated by the owner or operator of the airport and which are directly and substantially related to the actual air transportation of passengers or property; or for noise mitigation purposes on or off the airport. The following exceptions apply to this paragraph:
   1) If covenants or assurances in debt obligations issued before September 3, 1982, by the owner or operator of the airport, or provisions enacted before September 3, 1982, in governing statutes controlling the owner's or operator's financing, provide for the use of the revenues from any of the airport owner's or operator's facilities, including the airport, to support not only the airport but also the airport owner's or operator's general debt obligations or other facilities, then this limitation on the use of all revenues generated by the airport (and, in the case of a public airport, local taxes on aviation fuel) shall not apply.
   2) If the Secretary approves the sale of a privately owned airport to a public sponsor and provides funding for any portion of the public sponsor's acquisition of land, this limitation on the use of all revenues generated by the sale shall not apply to certain proceeds from the sale. This is conditioned on repayment to the Secretary by the private owner of an amount equal to the remaining unamortized portion (amortized over a 20-year period) of any airport improvement grant made to the private owner for any purpose other than land acquisition on or after October 1, 1996, plus an amount equal to the federal share of the current fair market value of any land acquired with an airport improvement grant made to that airport on or after October 1, 1996.
   3) Certain revenue derived from or generated by mineral extraction, production, lease, or other means at a general aviation airport (as defined at Section 47102 of Title 49, United States Code), if the FAA determines the airport sponsor meets the requirements set forth in Sec. 813 of Public Law 112-95.

b. As part of the annual audit required under the Single Audit Act of 1984, the sponsor will direct that the audit will review, and the resulting audit report will provide an opinion concerning, the use of airport revenue and taxes in paragraph (a), and indicating whether funds paid or transferred to the owner or operator are paid or transferred in a manner consistent with Title 49, United States Code and any other applicable provision of law, including any regulation promulgated by the Secretary or Administrator.

c. Any civil penalties or other sanctions will be imposed for violation of this assurance in accordance with the provisions of Section 47107 of Title 49, United States Code.

- Lobbying fees and attorney fees, to the extent these fees are for service in support of any activity or project for which airport revenue may be used
- Costs incurred by government officials, to the extent that such costs are for received and documented services to the airport
- General government service or officials in the proportion they serve the airport
- Support of community activities or community-purpose uses of airport property, if such expenditures are directly and substantially related to the operation of the airport
- Capital or operating costs of the portion of an airport ground access project that can be considered an airport capital project

### Prohibited Uses

The prohibited uses are, in general, payments that would take away from the operation and maintenance of the airport or are in excess to the value received by the airport. The FAA defines prohibited uses as follows:

- Payments that exceed fair and reasonable value of the services provided to the airport (administrative fees)
- General economic development
- Payments in lieu of taxes or other assessments that exceed the value of services provided
- Payment to compensate nonsponsoring governmental bodies for lost tax revenues exceeding stated tax rates
- Direct subsidies of air carrier operating costs
- Rental or use of facilities for nonaeronautical uses at less than market value, with an exception for use of property by nonprofit aviation organizations

FAA Order 5190.6: Airport Compliance Manual, Chapter 15: Permitted and Prohibited Uses of Airport Revenue, and the Federal Register notice upon which it is based, Federal Register, Vol. 64, No. 30: Policy and Procedures Concerning the Use of Airport Revenue, provide additional details and examples of allowable and prohibited use of airport revenues.

### Fuel Tax Revenue

Because taxes on aviation fuel are not directly a small airport revenue issue but are related to airport revenues, the FAA has been working to address them to ensure that these revenues remain in the aviation system. In 2014, the FAA amended the airport revenue regulations to include proceeds from any tax imposed on aviation fuel by a state or local government as airport revenue, unless the tax was in effect on December 30, 1987. As airport revenue, the aviation fuel tax revenue is to be used for purposes for which other airport revenues may be used. Proceeds from a state tax on aviation fuel can also be used for a state aviation program. States are to be in compliance with the aviation fuel tax requirements by December 8, 2017, unless an extension was requested, as detailed on the FAA's web page on aviation fuel tax action plans and status.

### Nonaeronautical Revenue

An airport may also generate revenue that is classified as nonaeronautical. The generation of nonaeronautical revenue is allowable and encouraged. Typically, the airport manager has more flexibility in uses for nonaeronautical revenue, versus that of aeronautical revenue. While nonaeronautical revenue can be used for the same uses as airport revenue, it is not limited to just the approved uses mentioned previously.

FAA Advisory Circular 150/5100-19: Guide for Airport Financial Reports Filed by Airport Sponsors provides a detailed list of what is considered airport revenue and what is considered

nonaeronautical revenue. The types of nonaeronautical revenue that can be generated on an airport vary with the type of activity on the airport. There are generally more opportunities to generate nonaeronautical revenue at an airport with commercial service. Nonaeronautical revenue sources include the following:

- Lease revenue from compatible land-use development
- Nonaeronautical building leases
- Retail and concession sales
- Rental car operations
- Parking
- In-airport advertising

At small airports without commercial service, the most likely nonaeronautical revenue is from compatible land-use development and nonaeronautical building leases.

When rates are set for nonaeronautical use, they must be based on FMV, with limited exceptions for property with community purposes, nonprofit aviation organizations, transit projects and systems, and military aeronautical units, as described in FAA Order 5190.6, Chapter 17: Self-Sustainability. Airport property (as shown within the airport property line on the airport layout plan (ALP)) used for nonaeronautical use requires a land release from the FAA, even for a lease, unless it is approved by the FAA as concurrent use.

For small airport managers, the most important part of using airport revenue and avoiding revenue diversion is to understand what airport revenue is and to make sure it is used for an approved use and not taken from the airport to fund other local government activities.

As identified in FAA Order 5190.6, Chapter 19, at small airports with commercial service that have received an AIP grant since January 1, 1995, annual airport financial reports must be filed with the FAA on Form 5100-126, Financial Governmental Payment Report, and Form 5100-127, Operating and Financial Summary, which provide detailed instructions for airport operators. When reports are filed electronically, a paper copy is not required.

## 3.2 Budgets

### Key Insights

*A budget is an important tool in the financial management of an airport and the development of financial and administration key performance indicators.*

*The complexity of the budget will vary depending on the size and type of operations at an airport.*

*Budgets should be categorized in a way that will offer the airport manager the best possible information regarding his or her ability to meet financial goals.*

### Key Definitions

**Benefit–cost analysis**: A systematic approach to estimating the strengths and weaknesses of alternatives by determining options that provide the best approach to achieve benefits while preserving savings.

**Budget**: An estimate of income and expenditure for a set period of time.

**Incremental budget**: The most used budgeting technique. Typically adds increments to the prior year's budget based on changing conditions and new requirements; anticipates line-item trends for the new budget year.

**Performance-based budget**: This budgeting technique begins with established performance goals, or return-on-investment goals, and attempts to ensure that capital and operating expenditures are set to achieve these goals.

**Zero-based budget**: Budget line items from the prior year are zeroed out, and the new line-item budget is built from a zero baseline; used primarily to set up the airport's operating budget.

### Budgets

A budget is the tool an airport manager should use to align the financial needs and goals of the airport with the available revenue. It may also be used to demonstrate to a policymaking board or airport sponsor, such as a city or county, the need for increased revenue to meet the airport's ongoing expenses. An airport may have more than one type of budget to align with its intended function. The two primary types of budgets are the operating budget and a capital budget.

#### *Operating Budget*

An operating budget can be a simple, operating profit-and-loss statement. The operating budget is used in the budgeting process to capture all operating revenues by type and all operating expenses by type. Table 6 shows common items in a budget. Two budget templates are included in *ACRP WebResource 6*. These templates are based on more complex small airports to encompass the extent of the items that may be part of an operating budget. An operating budget can be used airport-wide, or within a cost center(s). At small airports, it is more common to have one budget. The operating budget is used to ensure that budgeted revenues will cover, and potentially exceed, budgeted expenses within one or numerous cost centers by a preset operating margin or factor. The operating budget is a tool for the airport manager to manage the financial functions of the airport. The budget should be reviewed on a regular basis during the budget year to identify how the operations of the airport are aligning with the budget. If expenses are below the budget, revenues are exceeding the budget or both, there may be an opportunity to

**Table 6. Elements in a budget.**

| Operating Expenses | Nonoperating Expenses |
|---|---|
| 1. Wages and benefits<br>2. Consultants<br>3. Supplies<br>4. Ground maintenance<br>5. Vehicle maintenance<br>6. Building maintenance<br>7. Utilities and services<br>8. Insurance<br>9. Advertising | 1. Depreciation<br>2. Debt service<br>3. Capital improvement<br>4. Interest<br>5. Government contribution<br>6. Amortization of deferred financing<br>7. Licenses<br>8. Losses or damages |
| **Operating Revenues** | **Nonoperating Revenues** |
| **Fees**<br>1. Fuel flowage<br>2. Landing fee and apron parking<br>**Concessions**<br>1. Restaurants<br>2. Retail shops<br>3. Parking<br>4. Rental cars<br>5. Airshow<br>6. Taxi, limo, network transportation companies<br>**Leased Areas**<br>1. Fixed-base operator<br>2. T-hangars<br>3. Agriculture<br>4. Airline space<br>5. Office areas | 1. Property taxes<br>2. Government grants<br>3. Interest income<br>4. Sale of property<br>5. Investment income<br>6. Subsidies<br>7. Passenger facility charge<br>8. Customer facility charge (rental cars) |

address additional needs (expenses). If the reverse is true, steps must be taken sooner rather than later to identify how to reduce costs or increase revenues.

Along with the operating budget, it is important for small airport managers to understand the cash flow of revenues. Income streams and expenses may not align, especially when revenues are paid less frequently, such as an annual payment from agricultural operations or hangar payments that are paid less often than monthly, such as quarterly. It is important for the airport manager to budget not only for expenses but also for the timing of expenses. Depending on the size of the airport, there may also be times when it is necessary to borrow money to meet current needs that will be paid with future revenues.

### *Capital or Financial Budget*

In addition to an operating budget, an airport may have a separate capital budget to help manage cash flow of annual capital improvement needs. A separate capital budget is more common at an airport with multiple capital projects each year. It is also more common at airports with commercial passenger service, because the airlines may need to review and support the operating and capital costs separately. Whether or not a separate capital budget is used, it is important for an airport to plan and budget for the local share of grant-funded capital projects.

The purpose of a detailed capital budget, something also referred to as a financial budget, is to assist in managing the capital improvement program planning. A capital budget includes a statement of net assets, a statement of cash flows, and sources and uses of cash. It is an important tool to develop the airport's capital improvement program and demonstrate to the granting agencies, as well as the local policymaking board, that local share of capital improvements can be achieved within the policy for cash and cash reserves.

## Budgeting Techniques

There are several techniques that can be used to establish the capital or operating budget, including incremental, lump sum, zero based and performance based.

### *Incremental Budget*

Incremental budgeting, also referred to as traditional budgeting, is the budgeting technique used most often. It typically adds incremental increases or decreases to the prior year's budget, based on changing conditions and new requirements. It is more effectively used for managing airport financial operations if the increases or decreases are applied per line item rather than the overall budget. In an incremental budget, the goal is to anticipate trends for the new budget year, such as a percentage increase in utility costs or a percentage increase in hangar rental rates. Information from the previous year's budget is used as a starting point, with the incremental increases or decreases in categories based on expectations for the upcoming year.

### *Lump-Sum Budget*

A lump-sum budget typically is only used at a very small airport and may be used if the operation of the airport is a line item within a larger municipal department budget. A lump-sum amount is allocated to the airport, and the manager then uses judgment in expending it throughout the year. If an airport manager receives a lump-sum budget, the airport manager should develop a more detailed budget to administer the major categories of airport revenue and expenses.

### *Zero-Based Budget*

In a zero-based budget, the line items from the prior year are zeroed out. This results in the new line-item budget being built up from a zero baseline. This budgeting technique is used primarily to set up the airport's operating budget. It intentionally does not use information from previous budgets to establish the new budget, so that the budget is re-examined annually for operating needs. The purpose of this re-examination is to prioritize the needs. Because this process requires the needs to be prioritized, it essentially combines planning and budgeting into one process. A zero-based budget is more time consuming to prepare than an incremental budget. However, the process of establishing a line-item budget can help zero out organizational legacy costs that are no longer valid.

A variation on a zero-based budget is a target-based budget. In a target-based budget, an estimate of revenue is prepared, and a spending limit is established for the airport based on that estimate. The airport manager is then responsible to stay within the target spending budget.

### *Performance-Based Budget*

This technique begins with establishing performance goals, or return-on-investment goals. It attempts to ensure that capital and operating expenditures are set to achieve these goals. Key performance indicators are used to measure progress toward the goals or show the benefits of the expenditures. For example, a capital investment in light-emitting diodes (LEDs) for the airfield should contrast capital costs to an expected return on investment via reduced energy costs. The performance indicators are then established to ensure that the expected energy cost reductions take place over an established time frame.

A performance-based budget aligns expenditures with goals, and the performance indicators are then used to measure progress toward the goals. This method can be employed for any investment that has defined costs, cost savings and a return on that investment over some period of time. The method can be used whenever the organization has an established return-on-

investment policy, and it should be considered as complementary to the broader incremental or zero-based budgeting techniques.

## Preparing a Budget

There are four phases to a budget cycle: preparation, approval, execution and audit. The preparation of a budget starts many months in advance of the airport's start of the fiscal year, to allow for the budget requests to be made, revised and compiled into the overall airport budget. Allow time in this budgeting process for the budget review and approval by the appropriate governmental entity at a publicly owned airport. For a publicly owned airport, the budget approval process may involve the opportunity for public hearings or other reviews.

If an airport has multiple departments, each department should provide input or prepare a department budget to be considered in the overall process. In preparing the budget, the airport should assess its financial condition, regarding its overall revenues, expenses and cash position. Next, the revenues and expenses should be projected for the coming year. Growth forecasts should be developed for each budgeted revenue or expense category. Pertinent questions should be asked during this process, such as: What will be the increases in rental rates or new activity? What will be the anticipated increase in fixed costs, such as salaries and benefits? Are there anticipated purchases or maintenance requirements, such as new equipment or pavement maintenance? The budgeting process usually involves some give-and-take to prioritize expenses while trying to align with projected revenues.

## Using the Budget as a Management Tool

The budget is a management or decision-making tool for the airport manager in executing the airport's financial operations. The airport budget should be used throughout the year as a guide and tool for making spending decisions. Budget transfers can be made during the course of each year within line items, as long as solid budget management takes place. There may be limits and prohibitions regarding transfers from primary sources, such as major capital to operating, etc. Each month can be viewed as a one-twelfth snapshot of the whole to establish proper budget control. The exceptions to this are large budget expenses or revenues that may be paid or received on a basis other than monthly, such as quarterly, semi-annually or annually. These must be considered during the monthly budget reviews.

Near the end of the fiscal year, if the revenues have exceeded the expenses, there may be an opportunity to accelerate some unbudgeted costs from the next year to the current year, such as equipment or supply purchases that will benefit airport operations in the future year. An airport manager should consider whether additional spending is necessary now, to attain the expected budget decrease in the following fiscal year.

At the close of the fiscal year, the end-of-year results should be prepared. Also, regular audits should be conducted to demonstrate compliance with required financial practices and identify opportunities for improvement.

At a commercial service airport, there are also specific financial report requirements, as detailed on the FAA web page about its Airport Financial Reporting Program.

## 3.3 Managing the Airport as a Stand-Alone Business

### Key Insights

*The airport manager acts as a property developer and business manager. The airport manager should lead the organization from a set of well-defined goals.*

*Setting goals can help establish reasonable expectations with the airport board or municipal government.*

*Use the airport business plan to establish goals, develop key performance indicators and focus on the bottom line.*

*Standard financial accounting software should be used to manage the airport business.*

### Key Definitions

**Accrual-based accounting**: Under the **accrual** basis, revenues and expenses are recorded when they are earned, regardless of when the payment is issued.

**Airport revenue**: All fees, charges, rents or other payments received by the sponsor for use of the airport property and services; sale, transfer or disposition of airport real property; sale or lease of sponsor-owned mineral, natural or agricultural products or water taken from the airport; revenue from sponsor activities on the airport; and state or local aviation fuel taxes, except taxes in effect on December 30, 1987.

**Cash accounting**: The cash method accounts for revenue only when the money is received and for expenses only when the payment is made.

**Exclusive rights**: The provision of aeronautical services by a person or company other than the airport cannot be construed as exclusive by the provider.

**Key performance indicator (KPI)**: A defined, quantifiable performance measurement used to help assess how an organization is performing relative to its goals.

**Proprietary exclusive rights**: The owner of a public-use airport may provide aeronautical services to the public at the airport. This right may be exercised by the airport in the absence of a qualified commercial operator or when it is in the best interest of the public and must be provided by the airport owner's staff.

**Self-fueling**: The fueling or servicing of an aircraft by the owner of the aircraft.

### Operating the Airport Like a Business

The role of the modern airport manager has evolved from an operational coordinator to include business manager and economic or property developer. This change is occurring because the focus of airports, by necessity, has moved more toward operating as a business in order to generate increased revenue to support the airport operation. With airport subsidies becoming more difficult in most municipalities, the airport management role has evolved to meet this financial need. In order to grow into this role, the airport manager should have a basic understanding of business management and accounting principles.

### Considering Accrual Versus Cash-Basis Accounting

There are two primary accounting methods: accrual and cash. The airport sponsor's governing agency most likely will dictate the accounting method to be used. The difference between

the two methods is the timing of when revenues and expenses are recorded. In accrual-based accounting, revenues and expenses are recorded when they are earned, regardless of when the money is received or the payment is made. This method is more commonly used than the cash method. In cash accounting, revenue is only accounted for when the money is received and expenses only when the payment is made. The cash method is mostly used by small businesses and for personal finances.

Cash accounting is generally best only for very small airport markets with minimal payable and receivable accounts. Accrual accounting is more consistently used by most airports. Additionally, accrual-based accounting is considered a best practice for most governmental entities.

## Establishing Financial Controls

Financial controls are needed to monitor financial transactions, report financial results, protect assets and eliminate the potential for fraud or embezzlement. At a minimum, financial controls should include establishing staff qualifications, responsibilities and signing authority; financial policies; guidelines for document management; requirements for handling accounts receivable, accounts payable, bank accounts, and payroll and managing capital assets; and inventory.

If the municipality or authority has an enterprise-level financial management system, it is best practice for the airport to have a compatible, or the same, system to ensure the ease of data management throughout the entire organization. For stand-alone airports or airport authorities, off-the-shelf accounting systems are available. Stand-alone financial systems should be robust enough to handle the level of sophistication and need expected well into the future and to allow data mining sufficient for the airport to set financial performance indicators, track goals throughout the year and provide the basis for periodic and year-end reporting.

## Establishing Business Policy

When operating an airport as a stand-alone business, the business policy should guide business decisions. The policy should be set at the board, commission or director management level and balance airport needs with user needs. The business policy provides a fallback for airport management when dealing with outside interests. The policy should align with the strategic goals of the organization. *ACRP Report 77: Guidebook for Developing General Aviation Airport Business Plans* will help develop a useful strategic policy for your airport. *ACRP Report 77* also offers a worksheet to assist airport staff with implementing a business plan.

The types of business policies must be tailored to the individual airport but will include policies on topics such as rates and charges, aeronautical business incentives, minimum development standards, leasing for ground and buildings, broker or developer arrangements for nonaeronautical property development, return on investment and unrestricted cash on hand (monetary reserves not dedicated to a particular use).

Establishing a solid business policy is a crucial first step in the top-down management of airports. Business policies for municipal airports will most usually follow policies set for the entire municipal enterprise. Without the establishment of this high-level policy that directs the business development parameters for airport staff, operating as an airport business becomes very difficult.

## Setting Goals and Focusing on the Bottom Line

As part of operating an airport like a business, airport managers set goals, track progress through KPIs and focus on the bottom line. Setting goals, as a part of either an overall business

plan or an annual financial planning or budgeting process, should touch on every aspect of managing the airport, including operational, administrative, financial and capital development. Setting goals should also include an understanding of historical performance versus goals. These broad goals must be customized to each airport.

Establishing KPIs is the first and most important step in setting goals and establishing a bottom-line focus for your organization. The long-term or annual goals should be derived from your list of performance indicators and should give you a strong indication of the pulse of what is happening at your airport.

The goal-setting process should be an annualized, or roll-up, list of your more detailed monthly or quarterly performance indicators that are being tracked. Common examples of annual goals are profit-margin goal by percentage, business development goals by a number of new tenants or businesses, fuel sales by type and completed capital projects.

Goal setting and managing from focused annual performance indicators will help ensure that the airport will be bottom-line driven. Developing and keeping a bottom-line focus is an important step toward improving the long-term financial sustainability of the airport.

## Establishing Performance Indicators

What you can measure, you can manage. KPIs provide the tools to measure airport operations so that they can then be managed.

Performance indicators, commonly referred to as "key performance indicators" or "KPIs," should be established for all aspects of airport management: operations, financial, administrative and capital development. A detailed set of customized KPIs is typically established, and these will roll up to annual goals, as mentioned previously. Establishing KPIs is critical to operating the airport as a business. The KPIs must be items that can be measured. They also must be valid indicators of what is really happening in the realm they are developed to measure for each airport. *ACRP Report 19A: Resource Guide to Airport Performance Indicators* identifies KPIs applicable to all types of airport, including small airports.

Performance indicators can be used for annual goal setting and then used for tracking progress versus goals. Some examples of typical performance indicators include the following:

- Fuel sale dollars per itinerant operation, or per based aircraft
- Monthly fuel flow revenue
- Monthly or quarterly airport revenue per operation
- Monthly or quarterly operating expense per operation
- Monthly or quarterly fuel sale ticket per aircraft
- Monthly or quarterly number of maintenance work orders closed
- Monthly or quarterly complaints received airport-wide
- Monthly or quarterly T-hangar or storage hangar lease revenue
- Monthly or quarterly return on airport facility investment versus goal
- Monthly or quarterly profit margin versus goal

In addition to the list of performance indicators in *ACRP Report 19A*, a list of potential KPIs for small airport management is included in *ACRP WebResource 6* (crp.trb.org/acrp0132).

## Understanding Exclusive Rights

Exclusive-rights clauses protect airport users from private monopolies. The establishment of minimum standards per FAA Advisory Circular 150/5190-7: Minimum Standards for Commercial Aeronautical Activities helps an airport sponsor avoid granting exclusive rights.

**Grant Assurance 23: Exclusive Rights**

[The airport sponsor] will permit no exclusive right for the use of the airport by any person providing, or intending to provide, aeronautical services to the public. For purposes of this paragraph, the services provided at an airport by a single, fixed-based operator shall not be construed as an exclusive right if the following apply:

a. It would be unreasonably costly, burdensome, or impractical for more than one fixed-based operator to provide such services.

b. If allowing more than one fixed-based operator to provide such services would require the reduction of space leased pursuant to an existing agreement between such single fixed-based operator and such airport. It further agrees that it will not, either directly or indirectly, grant or permit any person, firm or corporation the exclusive right at the airport to conduct any aeronautical activities, including, but not limited to charter flights, pilot training, aircraft rental and sightseeing, aerial photography, crop dusting, aerial advertising and surveying, air carrier operations, aircraft sales and services, sale of aviation petroleum products whether or not conducted in conjunction with other aeronautical activity, repair and maintenance of aircraft, sale of aircraft parts and any other activities that, because of their direct relationship to the operation of aircraft, can be regarded as an aeronautical activity, and that it will terminate any exclusive right to conduct an aeronautical activity now existing at such an airport before the grant of any assistance under Title 49, United States Code.

At some airports, there may be only one aeronautical service operator providing one or all of the services available. This might occur when only one operator has applied to provide these services with no competition present. As long as the airport owner allows the opportunity for other operators to also offer a commercial aeronautical activity at the airport, an exclusive-rights violation does not exist. There may be situations at small airports with minimal space suitable for aeronautical activities in which a single operator already occupies all available space. An exclusive-rights violation may occur if an airport owner unjustly leases all available space to a single user. An airport sponsor may also deny an operator of aeronautical activity the right to operate on an airport for safety reasons. Restrictions based on safety should be discussed with the local FAA ADO. The FAA is often the final authority in the matters of potential compromises to safety. Additionally, the FAA ADO should always be consulted in any situation that might require a decision on exclusive rights.

## Understanding Proprietary Exclusive Rights (of an Airport Sponsor)

Proprietary exclusive rights are allowable. As described in FAA Order 5190.6: Airport Compliance Manual, Chapter 8: Exclusive Rights, Section 8.9a: Aeronautical Activities Provided by the Airport Sponsor, proprietary exclusive rights means the owner of a public-use airport may elect to provide any or all of the aeronautical services needed by the public at the airport. The airport sponsor may exercise, but not grant, an exclusive right to provide aeronautical service to the public. If the airport sponsor opts to provide an aeronautical service exclusively, it must use its own employees and resources. Thus, an airport owner or sponsor cannot exercise a

proprietary exclusive right through a management contract. The right of the public airport operator to provide these aeronautical services, using its own staff, can also afford the airport the opportunity to become more financially self-sufficient. When considering proprietary exclusive rights, in addition to equipment and staffing consideration, an airport also needs to consider budgetary impacts of purchasing fuel for resale and insurance requirements.

This proprietary exclusive right may be exercised in the absence of a qualified commercial operator, or when in the best interests of the public. The best interests of the public include conditions such as the airport sponsor choosing to perform the aeronautical services itself in order to become more financially self-sustaining, or the fixed-base operator (FBO) lease is expiring and the airport sponsor elects to start providing the aeronautical services to improve customer service. The proprietary exclusive right most often occurs when an airport or municipality elects to exclusively provide fuel service to aircraft, but it can extend to full FBO services.

When considering aeronautical services, airport owners should not attempt to prohibit aircraft owners the right to self-service. Aircraft owners are entitled to maintain, fuel and service their aircraft, subject to reasonable rules and regulations of the airport and in accordance with federal regulations. It is important to establish airport rules and regulations to allow aircraft owners to self-fuel while maintaining control for how self-fueling occurs. *ACRP Legal Research Digest 8: The Right to Self-Fuel* explores the meaning and constraints related to self-fueling at airports.

## 3.4 Revenue Generation and Diversification

### Key Insights

*Because of escalating airport facility costs and pressure to end or reduce airport subsidies, airport managers must continually seek to maximize all revenue sources at their facilities.*

*Commercial opportunities at each airport are unique and driven by each airport setting. One size does not fit all in airport revenue generation and diversification.*

*Strategic and business planning for airports can set the stage for maximizing revenue opportunities and diversifying the airport revenue base. This is the recommended first step in developing your revenue generation program.*

*As a best practice, many airport managers have begun to adopt a business or property developer role and mindset as a primary management focus.*

### Key Definitions

**Aeronautical revenue**: Revenue generated from core aeronautical activities, defined as those activities that take place on the airfield or in non-passenger-dependent activities around the terminal.

**Fuel flowage fee**: Fixed fee added to each gallon of fuel pumped or percentage added to fuel purchased at the airport to support airport operations, which is generally collected from a private entity that provides the fueling services and is remitted to the airport owner.

**Nonaeronautical revenue**: Revenue generated from nonaeronautical activity, which is a broad category that encompasses the passenger-dependent activities such as food and beverage, retail concessions, parking and rental cars as well as rent on land and nonterminal facilities and fees collected for activities and services on airport property. Ground lease and property development revenues derived from property that has the long-term designation of "nonaeronautical," or not needed in the long term for supporting aeronautical activities, can also be classified as nonaeronautical revenue.

**Nontraditional revenue sources**: Any local source that can be developed at the airport for enhancing the revenue base (e.g., oil, gas and mineral rights, nonaeronautical property development, local agriculture, forestry, hunting rights, solar installations, airport cities or mixed-use development, etc.)

**Solar installation**: Any ground-based solar energy installation and those solar energy installations co-located with a building or structure (e.g., rooftop installations).

### Guiding Principles for Revenue Generation and Diversification

Today's small airports are under significant financial pressure, with state and federal programs becoming more competitive for fewer dollars and the costs of constructing and managing airport assets rising in the long term. Small airports have fewer traditional revenue sources than larger airports and are under continual pressure to relieve or reduce any local general fund subsidies the airport might receive. These dynamics have begun to push airport managers into the role of business or property developer.

In assuming this new role, airports should engage in self-assessment and pre-planning. This proactive approach to revenue generation and diversification will help the airport manager

develop reasonable local expectations and a program profile that ultimately can be implemented. To meet all the local expectations and to help ensure a successful outcome, the following macro-level steps are recommended:

- Initiate an airport master plan or business plan to identify goals, opportunities, investment required and policy requirements. This document can also be used to define nonaeronautical-use properties on an approved ALP, if this has not already happened. This planning function can also be beneficial to identify discreet revenue production sources and initiatives, establish revenue goals and develop return-on-investment policy and goals, revenue-based KPIs and broad implementation timelines and guidelines for each initiative.
- Initiate a self-assessment regarding local capabilities to help understand the role of airport manager versus the role of an airport property developer. This self-assessment should try to define all gaps in local capabilities for planning, legal, finance, property management or development and business acumen that will be needed for successful program implementation. It is recommended that *ACRP Research Report 176: Generating Revenue from Commercial Development on or Adjacent to Airports* should be referenced to access the self-assessment, site evaluation and implementation tools, as well as the other valuable information that is available.
- Define success by adopting reasonable goals and expectations. This can be accomplished either as a part of, or in parallel to, a business-planning effort.

## Importance of Planning and Adopting Revenue Generation and Diversification Goals

Revenue generation objectives and policies should be clearly stated in the airport's strategic business plan. The business plan should strive to encompass broad strategies for the development of the aeronautical and nonaeronautical land and facilities at the airport. Inclusion or consideration of the local government's policies or economic development goals is crucial to the successful implementation of the plan. Through the planning process, aeronautical and nonaeronautical property limits should be defined. The planning process will also allow for a conceptual understanding of the revenue potential and highest and best use for each land parcel. This level of pre-planning will be required in order to obtain the necessary buy-in from the various agencies, including the FAA, which will be a critical factor in developing the follow-up marketing plan.

In completing the business plan, or in parallel with a business plan, it is necessary to understand the specifics of distinct revenue generation at your airport. An evaluation, typically referred to as SWOT (strengths, weaknesses, opportunities and threats) analysis, with the self-assessment tools mentioned in the previous subsection, can be used to provide a realistic understanding of potential property uses and related upside revenue streams for the property designations. Establishing relationships with the local and state economic development agencies or coalitions benefits the airport, because these entities will be more familiar with the potential available development opportunities and may provide insights to understanding the hurdles of economic development, including the identification of local competing sites.

As already stated, revenue generation is critical to the success of the airport and can lead to an increased fiscal self-sufficiency. Diversifying the airport's revenue streams is necessary to accomplish this goal and, like for any business, will help ensure a steady flow of revenues during economic downturns.

## Common Revenue-Producing Activities

Common revenue-producing activities include the standard aeronautical sources of fuel sales, fuel flowage fees or both; hangar leases; tie-down and ramp parking fees; ground lease for the construction of an aeronautical facility; and leases of terminal or office space for aeronautical

purposes, such as flight schools or FBO operations. *ACRP Synthesis 19: Airport Revenue Diversification* addresses how airports can incorporate revenue diversification in their planning processes. *ACRP Synthesis 19* focuses on aviation services, nonairline tenants and ancillary land use. A new challenge, especially for commercial service airports, is transportation network companies (TNCs), as addressed in *ACRP Synthesis 84: Transportation Network Companies: Challenges and Opportunities for Airport Operators*.

When negotiating the terms of lease-based sources, an escalator clause such as the consumer price index (CPI) or periodic appraisals should be included in the agreement to ensure that the increased revenues will be available to offset the increased expenses. An additional source of revenue for concession-based airport businesses might include the percentage of gross sales, although these may be difficult to administer, because they require audits of tenant records. The proper use of strong lease terms is discussed in Section 3.6: Leases, which is an important element of revenue generation.

Farming operations on undeveloped property may also be an option for some airports, as long as they are not carried out in runway and taxiway safety areas, do not exceed obstruction limits, do not create line-of-sight issues and are not a wildlife attractant. Lease terms for farmland should be relatively short term and renewed periodically through a bidding process in order to obtain the highest financial return. Lease terms can take into account and promote improvements to the farmland, such as drainage, to maximize the land's productivity. Nonaeronautical revenue may also be generated from other sources, including restaurants located on the airport but that draw patrons from the community, and the short-term rental of vacant facilities or conference rooms for special events. Some airports with sufficient land area have also developed business or industrial parks on airport land. This may require an upfront investment by the airport sponsor to prepare the land for development and also requires an FAA land release for developing a nonaeronautical use.

Nonaeronautical-development areas would include property for which there is no identified or master-planned long-term aviation need. This nonaeronautical designation should be the result of an airport planning process, and the land use must be depicted on an approved ALP. Depiction on the ALP is the first step toward a land release that is required to be obtained before airport land can be used for nonaeronautical uses.

The practice of leasing aeronautical facilities for nonaeronautical uses on a temporary basis for revenue generation requires FAA approval on a case-by-case basis, pending the demonstration that the facilities are empty and without aeronautical demand and that acceptable leasing terms can be established that can return the facilities to aeronautical use when there is demand.

Commercial service airports usually have a wider variety of additional revenue sources, including airline space rentals for ticket counters, offices, gates and baggage handling; landing fees for air carrier aircraft; parking, rental car, taxi and ride-share fees; space rentals for concessions; large aircraft maintenance, repair and overhaul facilities; advertising; and retail sales. Commercial development revenue sources, such as office buildings, business or industrial parks, rail and transport infrastructure, retail centers and logistic hubs, to name a few, are also a possibility for commercial service airports. The airport should establish expected performance indicators for all terminal-related revenue sources in order to track the performance of the various revenue sources and adjust lease and concession terms accordingly, when practical.

## Unique Opportunities for Revenue Generation

In addition to the more traditional revenue sources, several unique revenue opportunities may be available to airports, as identified in *ACRP Synthesis 19*. These may include the extraction of minerals, water wells and renewable energy sources, such as solar or wind farms.

*ACRP Report 108: Guidebook for Energy Facilities Compatible with Airports and Airspace* describes practices for aviation safety associated with the development of energy production facilities at and around airports. For example, the development of solar farms requires the airport sponsor to check for glare impacts to controllers or pilots on final approach, as identified in the FAA's Technical Guidance for Evaluating Selected Solar Technologies on Airports. This check can be done through modeling the potential glare. Height restrictions and the potential for impact on FAA radar facilities will dictate whether wind farms may be installed. These uses are considered nonaeronautical and will require a land release from the FAA for development. Recreational areas, such as golf courses or playing fields, can be considered. These types of recreational facilities should be established with caution because they may be designated a Section 4F recreational land—an environmental impact category—in the future and therefore may become difficult to close if the airport needs to develop that area. The temporary use of areas for special events, leasing or renting unused or closed pavements, and auctioning off airport equipment can also provide additional revenue to the airport. If an airport is pursuing renewable energy as a revenue source, *ACRP Report 141: Renewable Energy as an Airport Revenue Source* can be a guide. *ACRP Report 141* includes case studies from airports that have implemented renewable energy projects.

In accordance with the exclusive aeronautical rights provision for airports, commercial service airports can choose to perform aeronautical services that are more typically provided by the airlines. These services—such as marshalling, ground handling, baggage service and above- or below-wing services—have become a valuable additional revenue source for some small commercial service airports. In the smaller commercial service markets, the provision of these services can help market the airport to new carriers that do not want to take on the added expense of hiring ground staff, and this concept can also help the airport ensure consistent, high-quality customer service. The provision of these nontraditional services must not interfere with the business requirements of air carriers, and a detailed business plan with a benefit–cost analysis should be made before initiating any new services.

The provision of FBO services by airports is a concept that has gained significant ground over the last 20 years. Under the exclusive aeronautical rights provision for airports, many GA and small-to-large commercial service airports are providing exclusive FBO services. In a market with a reasonable annual fuel throughput of in excess of 500,000 annual gallons, this can be a very worthwhile additional revenue source. Great consideration and care should be taken by airport management to balance the many pros and cons of self-performing FBO services. However, numerous small airports have been successful in the provision of FBO services. *ACRP Synthesis 86: Airport Operator Options for Delivery of FBO Services* identifies the three types of FBO delivery options—traditional lease, contract management and self-performance—and explores the local factors used by airports to determine how to provide FBO services.

A concept that is gaining momentum and beginning to demonstrate success at some airports is the development of nonaeronautical property in a nonaviation mixed-use, or "airport cities," concept. The airport city concept is based on using the airport as a catalyst for surrounding development. While most of the current success has been at large airports, such as Dallas/Fort Worth and Denver, this concept is considered to be scalable to small airports.

When developing the nonaeronautical revenue potential of the airport, the community should consider using transportation-related synergies, forming strategic alliances with industries set to mutually benefit from the airport's success and using private equity and expertise (public–private partnerships, or P3s) as valuable tools. In this concept, the airport manager must think like a business manager and look beyond the airfield to visualize the airport and its potential.

## Revenue Generation and Diversification Best Practices

The most critical aspects of developing and diversifying revenue sources at the airport are solid, strategic business planning; a self-assessment of internal capabilities; and defining success by adopting reasonable goals and expectations for the various programs. From this perspective, the airport manager should plan and execute at the strategic level before putting out "for rent" signs.

General revenue generation and diversification best practices would include all of the strategic planning and proactive and organizational initiatives and would comprise the following:

- Initiating a master plan or business plan that will establish goals, identify opportunities, identify nonaeronautical property available for development, set reasonable expectations for success and provide a detailed, step-by-step implementation plan
- Self-assessment, a SWOT analysis or both to help assemble the necessary development resources
- Developing policy regarding rates and charges, approval for the use of P3 development, incentive program(s), developer or broker policy, property determinations or lease versus fee simple, and return-on-investment goals
- Documenting and understanding the legal, zoning, land-use planning, regulatory and FAA encumbrance implications for the nonaeronautical property site(s)
- Developing sustainability goals for the program: environmental sustainability through creative planning and design, and financial sustainability through asset management programs and sustainable development, such as solar farming, agricultural farming, etc.
- Setting goals or expectations for the program or programs with the governing body
- Implementation planning: site development, engagement of consultative and other resources and pre-investment in the site(s), in accordance with stated incentive and other policies
- Identifying and using private funding through P3s for aeronautical and nonaeronautical opportunities
- Constantly evaluating nontraditional revenue sources, such as self-performing aeronautical services and airport city development opportunities; brainstorming for local opportunities in farming, minerals, solar, etc.
- Developing a true entrepreneurial, property marketer or developer mindset among airport manager and local staff
- Developing solid partnerships with local economic development groups, industry and chamber organizations

The foregoing list is for reference of the small airport industry. You must determine what can be done and customize your approach to revenue generation and diversification based on your local environment and your own opportunities. It is important to remember that almost all revenue generation and diversification programs that are successful today are scalable to all airports and their own individual development dynamics and circumstances. *ACRP Research Report 176* provides airports with background on the legal requirements of commercial development at and around airports and tools to evaluate the potential at your airport. *ACRP Report 47: Guidebook for Developing and Leasing Airport Property* includes presentations on aeronautical-use development and nonaeronautical-use development that are available on the web page for the guidebook.

## 3.5 Rates and Charges

### Key Insights

*Aeronautical lease rates should be based on an aeronautical market analysis, not on a non-aeronautical or off-airport property market analysis; these markets operate separately.*

*Nonaeronautical properties must be appraised according to the local real estate market.*

*Aeronautical rates and charges should be keyed to a local or regional aeronautical or airport market analysis.*

*Information about rates and charges should be used as a baseline analysis for return-on-investment evaluations and policy decisions.*

*A policy of rates and charges should be set by the airport's policy board to ensure fundamental fairness and a proper return on public investment.*

### Key Definitions

**Charges**: A price paid for services rendered, such as fuel delivery.

**Fair market value (FMV)**: An estimate of the market value of a property, based on what a knowledgeable, willing, and unpressured buyer would probably pay to a knowledgeable, willing, and unpressured seller in the market.

**Fuel flowage fee**: Fixed fee added to each gallon of fuel pumped or percentage added to fuel purchased at the airport to support airport operations, which is generally collected from a private entity that provides the fueling services and remitted to the airport owner.

**Rates**: A fixed price paid for something for which there is value, usually property, buildings or fixed assets.

**T-hangar**: A hangar building, typically containing multiple units. This type of hangar derives its name from the shape of the interior of the units (in the form of a T), which increases the efficiency of the design so as to accommodate the wingspan and the tail section of an aircraft.

**Triple net lease**: A lease in which the lessee pays rent to the lessor as well as all taxes, insurance and maintenance expenses that arise from the use of the property.

### Rates and Charges for GA Airports

The airport has a responsibility to maintain the airport in a safe operating condition. Establishing a policy for rates and charges that ensures a positive revenue flow to cover the costs for the operation and maintenance and capital development is critical for the airport to remain economically viable and self-sustaining. Airports generally set rates and charges for a wide variety of provided services and for facilities available to the flying public.

Common rates for small airports without commercial services are as follows:

- **Fuel flowage fees**: Generally range from $0.05 to $0.15 per gallon at small airports but can vary based on local conditions, particularly if the fuel flowage fee is being used to fund a capital program. A percentage of fuel price may also be charged as a fuel flowage fee but can be harder to administer as it requires documentation because of price fluctuations.

- **Tie-down fees**: Typically, there are different rates for short-term (transient) and long-term tenants. Transient tie-down fees are typically per day and may be waived with a purchase of fuel or other airport services.
- **Landing fees**: Landing fees are less common at small airports, but some small airports that accommodate significant corporate traffic use landing fees to support operational costs.
- **Hangar rental fee**: Hangar rental rates are most commonly established in lease documents, but if space is available, an overnight hangar rental rate may be established for transient traffic.

Section 7.1: Transitioning to Commercial Airline Use Service addresses the additional fees associated with commercial passenger service.

### *Airport Compliance with Establishing Rates and Charges*

Rates and charges must maintain compliance with the airport's grant assurances, particularly the following:

- Grant Assurance 22: Economic Nondiscrimination
- Grant Assurance 23: Exclusive Rights
- Grant Assurance 24: Fee and Rental Structure
- Grant Assurance 25: Airport Revenues
- Grant Assurance 30: Civil Rights

FAA Order 5190.6: Airport Compliance Manual provides guidance to help airport operators establish rates within the framework of grant assurance requirements. Nonaeronautical rates are treated differently than aeronautical use rates, in that they need to be based primarily on a local fair market evaluation.

The ratemaking best practice is to set rates and charges outside of lease documents and have the lease document refer to the rates and charges policy. The FAA also has available an FBO Industry Consolidation and Price Practices Question and Answer Memorandum regarding rates charged by FBOs. This allows the rates and charges to be adjusted on a routine basis, without the need for lease amendments. As a sample, the rates and charges for Gary/Chicago International Airport are in *ACRP WebResource 6*.

The rates and charges should be reviewed on an annual basis and updated as required to ensure they are sufficient for the purpose intended. All leases and agreements should contain escalation clauses to ensure that the fees collected will grow in an amount equal to the rising cost of the operation and maintenance of the facilities. Leases are discussed in more detail in Section 3.6: Leases. When initiating the policy for rates and charges, it is critical to begin at a level that will ensure that the airport is not starting "in the hole." Appraisals can, and in some cases are required to, be used to set the lease rate for property and buildings, including hangars.

To protect hangars from becoming storage units, compare the square-foot rate of the hangar to local off-airport storage units and, if possible, set the hangar rate slightly higher.

Return-on-investment goals are usually applied to property or facilities that have an outstanding debt service requirement or were funded by the airport sponsor. In this case, the lease rate should be equal to the annual debt service or the unamortized, self-funded value plus funds set aside for maintenance, utilities, administrative costs, etc., unless these requirements are assigned to the lessee. If possible, the airport should also consider an additional fee to cover airport common-area operations and maintenance costs. When developing a return-on-investment policy, the best practice would be for the airport to consider, at a minimum, all cost components, including cost of capital, asset operations and maintenance, administrative costs and common-area costs, if applicable.

### *Market Evaluation*

Market evaluations consist of researching pertinent rate and charge data in similar representative markets. While there are many methods for conducting market evaluations, the most preferred method is surveys. Some state aviation agencies periodically, sometimes annually, conduct surveys that can be used to help determine appropriate charges. Results of the Wisconsin airport rates-and-charges survey are available online. An internet search on rates and charges may identify other studies as they occur over time. Also, some airports publish their current rates on their websites, which can be useful as a comparison. When conducting market evaluations by survey or interview, it is important to attempt to understand the underlying issues inherent to each airport that will cause its rates and charges to be skewed higher or lower than the overall market average. Detailed analysis is usually required in order to arrive at a true apples-to-apples comparison of rates and charges derived from the internet or via a survey.

## Rates-and-Charges Methodologies for Air Carrier Airports

Airline rates-and-charges methodologies can be classified as residual or compensatory and are discussed in more detail in Section 7.2: Airline Use Agreements. However, for many years, the airport industry has employed a hybrid model that incorporates aspects of residual and compensatory models. In Chapter 18 of FAA Order 5190.6, the FAA defines these methodologies as follows:

- Residual: Agreements that permit aeronautical users to receive a cross-credit of nonaeronautical revenues are generally referred to as residual agreements. In a residual agreement, the airport applies excess nonaeronautical revenue to airfield costs to reduce air carrier fees; in exchange, the air carriers agree to cover any shortfalls if the nonaeronautical revenue is insufficient to cover all-in airport costs. In a residual agreement, aeronautical users may assume part or all of the liability for nonaeronautical costs. A sponsor may cross-credit nonaeronautical revenues to aeronautical users, even in the absence of an agreement. However, except by agreement, a sponsor may not require aeronautical users to cover losses generated by nonaeronautical facilities. A residual rate structure may be accomplished only through agreement of the users. As the FAA emphasizes in the compliance manual, as well as in its 2013 Policy Regarding Airport Rates and Charges, an airport sponsor cannot impose residual rate making on airlines and must obtain the residual guarantee through a bilateral agreement.
- Compensatory: An agreement in which a sponsor assumes all liability for airport costs and retains all airport revenue for its own use, in accordance with federal requirements. Aeronautical users are charged only for the costs of the aeronautical facilities they use.
- Hybrid: Sponsors frequently adopt ratemaking systems that employ elements of residual and compensatory approaches. Such agreements may charge aeronautical users for the use of aeronautical facilities, with aeronautical users assuming additional responsibility for airport costs in return for a share of nonaeronautical revenues that offset aeronautical costs. A hybrid ratemaking methodology should be a subset of residual ratemaking methodologies. A compensatory ratemaking methodology without a residual protection should not be classified as hybrid.

## 3.6 Leases

### Key Insights

*Leases typically comprise a complex mixture of factors that represent a cost basis at a certain point in time.*

*While each lease consists of the same or similar core elements, each particular lease arrangement must be carefully tailored to the specific circumstances and characteristics of a landlord–tenant relationship.*

*It can be difficult to ensure the proper blend of lease term, rate of return or market rate, rate adjustment and reversionary requirements.*

*Because leases are effectively long-term partnerships, they also need to ensure effective routine maintenance, the service levels expected, the capital investment required and the ability of the airport to inspect and take corrective action, if necessary.*

### Key Definitions

**Base rent**: A set amount, used as a minimum rent in a lease, with provisions for increasing the rent over the term of the lease.

**Effective rent**: The actual rental rate to be achieved by the landlord after deducting the value of concessions from the base rental rate paid by a tenant, usually expressed as an average rate over the term of the lease.

**Fair market value (FMV)**: An estimate of the market value of a property, based on what a knowledgeable, willing and unpressured buyer would probably pay to a knowledgeable, willing and unpressured seller in the market.

**Graduated lease**: A lease that includes variable terms. The variable terms are triggered to change after a specific event takes place, such as periodic appraisals, the tenant's gross income changes or the passage of time.

**Land lease**: A long-term land lease, generally for the purpose of erecting a building or buildings or for constructing improvements to the land to be used by the lessee. The lease should reference the airport's rules, regulations and minimum standards. The land lease price per square foot could vary by location, possibly by the length of the term, and may be connected to a business permit or an FBO lease.

**Market value**: The highest price a property would command in a competitive and open market under all conditions requisite to a fair sale, with the buyer and seller each acting prudently and knowledgeably in the ordinary course of trade.

**Net lease**: A lease for which the payments to the lessor do not include insurance and maintenance expenses, which usually are separately paid by the lessee.

**Operating cost escalation**: Although there are many variations of escalation clauses, all are intended to adjust rents by reference to external standards, such as published indexes, negotiated wage levels or expenses related to the ownership and operation of buildings.

**Renewal option**: A clause giving a tenant the right to extend the term of a lease, usually for a stated period of time, and at a rent amount given in the option language.

**Reversionary clause**: The reversion of ownership of the improvements by the lessee to the landlord at the end of the lease agreement.

**Triple net lease**: A lease in which the tenant pays rent to the lessor as well as all taxes, insurance and maintenance expenses that arise from the use of the property.

## Airport Lease Philosophy

The nature and character of airport leases will vary, depending on the type of tenant and anticipated use of the airport property. Each new aeronautical lease represents a point in time, reflecting the market conditions, the investments to be made and services that must be rendered. Although equity among tenants with similar operations is an overarching goal, there will be differences between the tenants and leases due to the market forces prevalent at the time each lease is initiated.

It is the responsibility and duty of the airport sponsor to control and set the stage for airport development projects. The airport sponsor is responsible for defining and finding the appropriate balance between revenue maximization through development and meeting the demands of airport users and the surrounding community. Additionally, the airport sponsor, as applicable, is typically responsible for coordinating with the applicable stakeholders, including local, state and federal agencies, as well as the local community and business organizations.

Strong lease and rental agreement documents provide a clear understanding of the rights and responsibilities of the airport sponsor, as the lessor, and the lessee. A best practice agreement should provide the airport sponsor with control to act if the lessee is not meeting its obligations.

It is a best practice to set by ordinance certain fees that are subject to continual change, such as security fees, common-use fees and fuel flowage fees.

The lease should be written to correlate, and in most cases directly cite, the airport's minimum standards and rules and regulations. In the case of fees that are set by ordinance, the lease should reflect that those fees will be handled through the airport's policymaking process and that the rates will be those in the ordinance, including if the rates change. For long-term leases, this provides the airport sponsor with the ability to adjust these other fees and rates as needed to support the airport operations without requiring the lease to be amended to incorporate new fees or rates.

Written amendments should be prepared and signed by all parties to clearly document any changes to the lease or rental agreement. While lease and rental agreements reflect the point in time in which they are negotiated, the airport sponsor should always strive for lease and rental agreements and encourage aviation use and development, while enabling the airport to be, or make progress toward being, self-sustaining.

Several FAA grant assurances are particularly applicable to leasing airport property: 5: Preserving Rights and Powers; 22: Economic Nondiscrimination; 24: Fee and Rental Structure; and 38: Hangar Construction. Preserving rights and powers ensures the airport sponsor will not deprive the airport of any of the rights and powers necessary to operate the airport to meet the grant assurances. The economic nondiscrimination and fee and rental structure require the airport operator to make the airport available for public use on reasonable terms and without unjust discrimination to all types, kinds and classes of aeronautical activities and that the airport is as self-sustaining as possible. This means that within the same classes of aeronautical activity, the terms need to be similar, but the terms can vary between classes of aeronautical and non-aeronautical activity.

Also, the structure for fees and rentals requires the airport to be as self-sustaining as possible, meaning the airport manager must balance the revenue generated from aeronautical use with

the needs of the community. For nonaeronautical use on airport property, charging fair market value is the standard. The assurance for hangar construction enables the airport sponsor to enter a long-term lease for hangar construction and impose appropriate terms and conditions. *ACRP Legal Research Digest 23: A Guide for Compliance with Grant Agreement Obligations to Provide Reasonable Access to an AIP-Funded Public Use General Aviation Airport* provides additional information about the grant assurances that limit the sponsor from unreasonably restricting access for aeronautical activity at GA airports.

Keeping these grant assurances in mind when seeking to establish new airport property leases, the airport sponsor must begin the process with a strategic overview of the existing leases (if any), as well as the strategic goals and leasing policy of the organization. A best practice, especially at small airports with multiple leases, is to develop a leasing policy as described in Section 6.2.1 of *ACRP Report 47: Guidebook for Developing and Leasing Airport Property*, which is approved by the airport's policymaking board. The leasing policy establishes standard terms and requirements to serve as a leasing and airport development guide and provides a fallback position to aid in lease negotiation. It should also correlate with the airport's minimum standards. While strategically targeted industries can always be incentivized through beneficial lease terms, the airport must seek to promote a balance between economic development and the business needs of tenants.

## Common Types of Airport Leases

As described in *ACRP Report 47*, there are many common types of airport lease agreements:

- Airport land lease: One of the most common types of leases at an airport is an agreement that leases a parcel of airport land to a tenant, who in turn is responsible for developing, improving and maintaining the property. These leases contain terms regarding the reversion or disposition of the development at the end of the lease and any terms to extend the lease. These are typically long-term leases to allow the developer to receive a return on its investment.
- Airport land lease option or first right of refusal: This type of land lease allows the airport a nominal ground lease payment by offering the option holder a longer-term control of a land parcel. The airport must balance the expected annual option payment with the relinquishment of control of the parcel over the option term.
- Airport building lease: Similar to a land lease, except the airport owns the building and leases the building and ground to the tenant. These leases will vary, based on the type of operation using the building and whether there is investment required by either the lessor or lessee, for which a return on investment is needed.
- Hangar rental agreement: When the airport owns a hangar facility with multiple tenants storing aircraft within a building such as a T-hangar or community hangar, a hangar rental agreement is the typical leasing document. Hangar rental agreements tend to be a shorter initial term with an established renewal process or notice for terminating the lease after an initial lease period.
- FBO lease: A multifaceted lease, which provides for the operation of an aviation service business that offers a variety of services required or allowed in the lease, typically described in the airport's minimum standards. An FBO lease may encompass land and building leases and the payment of fuel flowage fees, a percentage of gross revenue or both. This type of agreement may also include development rights to unimproved land.
- Specialized aviation service operator (SASO) lease: This type of a lease allows the tenant to provide specific specialized aviation products or services. The airport's minimum standards are used to describe the SASO services allowed while avoiding unfair competition with a full-service FBO at the airport. The SASO lease may be with the airport sponsor or with an

FBO to enable the FBO to provide all the required services within its lease. An example of SASO is a flight school that only provides flight instruction but no other aviation services.

- Airline lease: Air carriers lease space in and around the terminal to carry out their core activities, including ticketing, passenger check-in, baggage handling, etc. Chapter 7 provides information related to commercial service operations at small airports.
- Concession lease: Other businesses that complement the aviation operations, such as a restaurant or rental car operation, may lease space from the airport. Concession leases may include a minimum annual guarantee (MAG) of the amount to be paid to the airport based on a per-square-foot rate or a percentage fee of gross revenues, with revenue sharing when revenues exceed the MAG to benefit the airport and incentivize the tenant. Concession leases also typically include requirements related to product offerings, operating hours or lease space improvements, if desired, during the lease term.
- Nonaeronautical-use lease: Not all tenants at an airport may operate an aircraft or provide an aviation-related service. This type of lease will be specific to the type of nonaeronautical land use while complying with FAA grant assurance conditions, if the property was originally purchased through a federal grant. A common nonaeronautical-use lease on small airports is for farming operations.
- Farmland lease: A lease of airport-owned land that can be agriculturally used to generate revenue without impairing its function as a buffer for airport operations. This type of lease should include any restrictions and requirements for the agricultural operations. It should also include language that provides the airport sponsor with the ability to develop that land, as needed.
- Sublease: Subleases are typically between tenants on the airport and an additional private tenant. Standard airport lease or rental agreements should include provisions that regulate the legal authority of a tenant to sublet all or a portion of a property it leases from the airport sponsor, and the requirement to obtain approval from the airport sponsor prior to subleasing the property. Sublease agreements must also conform to the airport's minimum standards.

*ACRP Legal Research Digest 30: Contract Risk Management for Airport Agreements* also provides a general overview of the types of agreements, including leases as well as other airport agreements and the risks associated with each type of agreement. The FAA does not allow lease terms longer than 50 years and encourages shorter terms.

## Common Lease Elements

An airport land or building lease agreement template, a hangar lease agreement template and a farmland lease agreement template are included in *ACRP WebResource 6* (crp.trb.org/acrp0132). The farmland lease agreement template has sample conditions specific to agricultural operations. While FBO and SASO leases are more specific to the operation at each airport, they are typically built upon a land or building lease with additional operating requirements. The templates in *ACRP WebResource 6* are intended as a starting point and **must be customized through a local legal review to** ensure that all applicable local, state and federal requirements are incorporated.

The primary difference between a land or building lease and a rental agreement is that, for the land or building lease, the lessee has the responsibility for and control over the operation of the building. In a rental agreement, the lessee is obtaining the right to occupy the space, but the responsibility for and control of the building typically remain with the lessor.

A rental agreement includes many of the same elements as a land lease, except for the elements associated with the operations and maintenance of the facility, because that responsibility would typically rest with the lessor.

### *Lessor*

The lessor is the owner of the property that is being leased. This is typically the airport sponsor or controlling agency with the authority to enter into contractual agreements. Contact information for the lessor for the notification of changes is included within the lease.

### *Lessee*

The person or business leasing the property from the owner. If the tenant of the facility will operate under a different name than the signatory of the lease, as in "doing business as" (dba), the dba entity is identified as well. A contact person for the lessee for the purpose of notification is included in the lease.

### *Premises*

The premises, or leased area, define the land and improvements subject to the lease agreement. It should include a legal description of the premises, including size and location, included improvements and equipment. It is recommended that a leasehold site exhibit be included in addition to the legal description of the property. In the case of a new development, it is highly recommended that the exhibit be prepared and certified by a land surveyor. If, in addition to the lease area, the lessee is leasing an option area or area of first right of refusal for future development, it should also be identified as part of the premises.

With a rental agreement, the premises are typically identified by a hangar name or unit number and its address, rather than a legal description of the property. An exhibit may or may not be included with a rental agreement.

The lease should document that the lessee is familiar with the existing conditions of the premises and accepts the premises in the existing conditions. A leasing best practice is to include a condition that the premises are returned to the airport in the same or similar state of repair at the termination point of the lease.

### *Use of Premises*

This states what activities can and cannot be performed within the leasehold. For example, if the lease is for a private hangar, it may exclude commercial activity or may limit what can be stored in the hangar. The lease should also state if the use is limited to aeronautical use or not. This portion of the lease must be specific to the individual lessee.

The lessee should be required to abide by the airport's minimum standards and operating rules and regulations, including any future changes. The lease document may include language requiring the lessee to acknowledge receipt and an understanding of the airport's minimum standards and rules and regulations.

For commercial aviation operations, the required and allowed commercial activities should be identified as part of the lease. The right to, or prohibition of, the fueling of aircraft should also be addressed in the lease, directly or by reference to the airport's minimum standards for that type of operation. This section may also detail the financial and maintenance responsibilities of the lessee.

If the leased premises, such as a hangar, cannot be accessed from a public roadway, the lease should also specify any requirements for the operation of vehicles on airport pavements. The lease or rental agreement should also indicate where the lessee-owned or lessee-operated private vehicles can or cannot be parked. If the airport issues an access card to lessees, a security deposit for the card and an annual check of the cards are recommended for accountability.

It is a security best practice that the airport have a system in place to ensure that access cards are being properly used by tenants. The airport rules and regulations should stipulate how these

cards will be used and cover penalties for misuse and the passing of access cards to unauthorized individuals.

### *Lease Term, Option to Renew, Right of First Refusal and Holdover*

The lease term should state the fixed period of time for which the lease is in effect. The length of the lease will typically align with the investment in the facilities. For new construction, typical airport lease terms range from 20 to 30 years. The FAA advises against longer lease terms and considers any term longer than 50 years to be a de facto, fee simple transaction. State regulations may also cap the term for a lease of public property. The term section may also include options or renewal periods that can be exercised by the lessee, and any associated notice or other requirements that must be met. An example of this would include a minimum investment required in order to exercise the lease option term. For instance, a 20-year lease may have two 5-year options with a 90-day notice requirement and a specified capital investment to be made by a specific date in order to exercise the out-year options.

When the lessee is required to construct a new facility as part of lease requirements, the lease may also grant a right of first refusal for the lessee at the end of the lease term and option periods. This means that the airport sponsor can offer the premises to other entities, but the original lessee has the first right to lease the premises at the terms offered by the other potential lessee.

Holdover provisions allow the airport sponsor to extend the terms of a lease, in the event the airport sponsor and lessee desire to continue the agreement but a new lease is not yet in place. Typically, holdover provisions continue on a month-to-month basis under the previous terms or other specified terms. The holdover provision should specifically state that it is not a lease extension agreement.

The most common term of a rental agreement for existing hangar space, such as in a T-hangar or community hangar, is one year from a specified commencement date.

### *Rent and Escalation Clause*

The rental rate should be based on the market value of the property following the airport's leasing policy, a required return-on-investment hurdle or other method to determine market value. Some methods used to determine market value include appraisal, a comparison to similar facilities, and competitive offers and should consider if a below-market incentive has been made in order to attract a specific type of development to the airport. If leasing the property to another public entity at a less-than-market rate, the airport should receive an operational or in-kind benefit in return for the lower rate. For example, an airport may lease property to the local fire department in return for having emergency services available at the airport. Best leasing practices include a written leasing policy that addresses how and how often lease rates would be modified as a means of protecting airport management from entering into poorly performing business deals.

It is a best practice to handle certain fees that are subject to continual change, such as security fees, common-use fees and fuel flowage fees, to be set by ordinance.

The rental agreement section should identify how the lease payment is derived, such as per square foot, plus any additional costs, such as a security fee, common-use maintenance fee, fuel flowage fee, self-fuel fee and percentage of tie-down or landing fee for commercial operators. The lease should clearly state the amount of payment per period. Typical payment periods are per month, quarter or year. This agreement section should also identify the day by which the payment is due, such as the first business day of the month, and the additional costs associated with late payments. A 10- to 15-percent late payment fee is common. It should also identify the location where the payment is to be delivered.

Any lease for a period of more than a year should also include an adjustment for inflation. The U.S. Department of Labor's CPI is commonly used by airports as an adjustment tool. The

increase in the lease rate is indexed to the increase in the CPI, typically with language prohibiting a decrease in the lease rate. In certain metropolitan locations, a locally generated price index may be preferable to using the broader-based CPI. Some lessees may desire to include a maximum increase amount for the entire term, such as not to exceed 50 percent. It is recommended that adjustments occur every 1 to 3 years and no less frequently than every 5 years. On leases with a term of 20 to 30 years, especially if they include buildings, it is also desirable to include the opportunity to reappraise the property at least every 10 to 15 years to adjust beyond that allowed under a CPI adjustment. When this reappraisal provision is included, typically the right to request the reappraisal is provided to the lessor and lessee, with the party that requests the reappraisal paying the reappraisal costs. Reappraisal is also recommended when initiating a new option period.

Many hangar rental agreements will automatically be extended or renewed for an additional rental period or up to a specified number of additional rental periods. When the lease can be automatically extended, the airport sponsor should include the right to adjust the rental rate in the agreement on an annual basis. If the agreement needs to be re-executed for each additional rental period, the rate adjustment can be included in the new agreement.

If the lease will automatically renew, the airport sponsor should include the right to adjust the rental rate annually, at the discretion of the lessor.

### *Security Deposit*

The type of deposit or security fee and the conditions under which it is to be paid and returned to the lessee should be identified in the lease or rental agreement. Depending on the use of the premises in the lease, the security may range from a deposit to a surety bond or letter of credit. If the lessee will construct new improvements, as part of the construction, the airport sponsor should require a performance and payment bond to protect its interest in the facilities under construction. If environmentally sensitive operations are to be conducted, an environmental liability insurance policy should also be required.

### *Taxes and Fees*

While the airport sponsor as a public entity is likely exempt from many taxes and fees, the lessee as a private developer on airport property or aircraft owner may or may not be exempt, depending on local and state regulations. The lessee's responsibility to pay these taxes and fees should be stated in the agreement.

### *Aircraft*

Especially with hangar rental agreements, in addition to identifying the lessee, a best practice is to identify the aircraft that is to be stored in the space, with the requirement that the lessee notify the lessor of any change in aircraft. This assists the lessor in documenting the use of the space for aviation purposes.

At some airports, hangar space is in high demand, and it is therefore in the airport sponsor's best interest to have active airworthy aircraft hangared at the airport. While there may be periods of time when an aircraft is undergoing maintenance or repair, a best practice is to require notification by the lessee of hangar space to the lessor if an aircraft is inoperable for more than a set period of time, such as 60 to 120 days. For aircraft out of service longer than the notification period, the lessor should have the right to grant an extension if there are factors beyond the lessee's control, such as obtaining parts.

Also, the FAA allows the final stages of construction of an experimental aircraft to occur within airport hangars. The lessor can allow this but may want to include a schedule or some reporting requirement to ensure progress is being made toward completion of an airworthy aircraft.

An airport may allow a hangar to be leased while an aircraft purchase is pursued. If the lessor wishes to allow this, a best practice is to include a specified period in which the purchase needs to occur.

If the airport has unused hangar space and no aviation demand, the FAA allows for a short-term lease for nonaeronautical use, but the lease must include the ability to terminate quickly to revert to aviation use when and if there is demand.

### *Rights, Reservations and Obligations of Lessee and Living Clauses*

A building or ground lease should specify the rights of the lessee, such as ingress and egress, signage within specified limits, quiet enjoyments (possession and unimpaired use of the leasehold) and approved additions or improvements to the facility. If new improvements are being made to the leasehold as part of the agreement, the lease agreement should specify the size and type of improvements, value, approval of plans requirement, schedule for completion and other associated details.

For hangar rentals, to control changes to airport sponsor-owned property, any alteration to the hangar or facility under lease should be required to be preapproved by the airport sponsor. The rental agreement should indicate that any changes become the property of the lessor.

### *Operation and Maintenance*

A building or ground lease should clearly specify the division of responsibility between the lessee and lessor for the cost to maintain the leasehold and the standards to which it will be kept. Common responsibilities of the building or grounds lessee include keeping the area clean and free of trash, mowing grass and removing snow on the immediate premises and meeting applicable environmental regulations. This section of the lease should also address who pays for utility costs and trash removal. Provisions should be included within the lease to allow the airport sponsor to address operations and maintenance needs if they are not being adequately performed by the lessee and to cover the ability to back-charge the lessee for the work.

In a rental agreement, typically, the lessor has the responsibility to maintain the hangar in decent, safe and sanitary conditions by making necessary repairs. The lessee also has the responsibility to keep the hangar in the condition accepted, except for normal wear and tear. The requirement to keep the hangar in a clean and safe condition is typically part of the rental agreement.

### *Sublease, Assignment or Sales Restriction*

The lease or rental agreement should either exclude the ability of the lessee to sublease, assign or sell their property lease rights or, if the ability is included, require prior approval of the lessor. The terms of this section should align with the type of facility and the lessee's investment in the facility. If the lessee builds a hangar on a 30-year lease, allowing for the sublease or sale of lease rights for the property may be reasonable, with lessor approval. If the lessor owns the hangar, restricting the right to sublease and instead allowing for a termination of the lease may provide more appropriate control to the airport sponsor. Some airports lease land with the anticipation of the property being developed and sold or leased to an end user. Leases for this type of development should allow for transactions, such as sale or lease with the appropriate notice and approval. A lessor can also include a transaction fee, as a percentage of the sale price as part of a lease, so that the airport sponsor can receive a benefit to cover its associated transactional costs.

### *Defaults*

The lease should identify the conditions or defaults that allow the lessor to prematurely terminate the lease, such as a declared bankruptcy; death; incompetency; failure to abide by

the requirement of the lease; failure to timely pay rent, taxes or fees; failure to provide proof of insurance; inappropriate or illegal use of the airport property; or abandonment of the property. In addition to identifying the defaults, the section should include actions the lessee can take to cure a default.

### *Liens*

Financial costs associated with improvements on airport property funded through a lending institution typically require some sort of security for the face value of the loan. A lien can be established against the improvement, but a lien on the property itself must be excluded in the lease agreement, because this would be considered a lien against the property interests of the FAA and would, therefore, be restricted.

### *Insurance*

To protect the airport sponsor from liability and to protect the investment on the leasehold, the lease should specify the types of insurance and minimum levels of coverage required to align with the use of the leased premises. Commonly required types of insurance for building or ground leases include property (structure and contents), general liability (bodily injury and property damage), automobile (if operating vehicles on the airport), hangar keepers (to cover aircraft storage) and environmental.

A rental agreement should document that the lessor is not responsible for loss by the lessee due to theft, fire, rain, wind, hail or other casualty. It should also specify the general liability and property damage insurance required to be maintained by the lessee for the term of the hangar rental agreement and the requirement to provide a certificate of insurance to the lessor. Some airports also require the aircraft owner to maintain hull insurance on the aircraft. The level of insurance required should be specified to align with the local conditions.

The lease should require the airport sponsor to be included as an additional insured on the coverage, and copies of the certificate of insurance must be provided to the airport sponsor on an annual basis as the policies are renewed. The lease should also clearly state that the lessor does not insure the lessee's property on or within the premises.

### *Indemnification*

The lease document should include language for the tenant to hold harmless or indemnify the airport sponsor from legal action that may be filed against the lessee. Many airport leases also include language to provide some level of indemnification for the lessee in the case of negligence by the airport sponsor or its agents.

### *Compliance with Regulations*

The lease should include the requirement that the lessee recognizes and meets all federal, state and local laws, including future changes in such laws. Based on the type of operations, some additional details regarding environmental laws or stormwater may also be specified in the lease, such as compliance with stormwater regulations being a lessee's responsibility. If the use of the leased premises involves the handling or generation of any hazardous waste, additional provisions to address these activities should be included in the lease documents. For airports that accept federal funding, the agreement should also be subordinate to existing and future FAA regulatory changes.

The installation and operations of any underground or above-ground storage tanks should require approval by the airport sponsor and associated permit and operator training compliance with federal, state and local laws, whichever are applicable. For leaseholds serving the general

public, or new development, lease provisions for complying with the requirements of the Americans with Disabilities Act will be necessary.

### *FAA Approval and Requirements*

Airport sponsors receiving AIP grants are bound by the associated grant assurances. Grant Assurance 30: Civil Rights prohibits discrimination on the grounds of race, creed, color, national origin, sex, age or disability. Tenants leasing airport land fall within these requirements, so the airport sponsor should include nondiscrimination language in its lease agreements. Also, to comply with Grant Assurance 23: Exclusive Rights, the lease should include language indicating the airport is not granting an exclusive right to the lessee. This is particularly important for leases to commercial aviation services operators. To protect a lessee from unfair competition, the airport's minimum standards document should specify the minimum facility and operational requirements for entities providing like services. FAA Order 5190.6, Appendix O lists general lease clauses for all airport agreements and for agreements that provide services to the public.

### *Rights, Reservations and Obligations of Lessor*

The lease should include the airport sponsor's right to access the property for inspection or to show the property prior to the expiration of a lease. The lease should identify the lessor's notice responsibilities that will be provided prior to inspection. The lease should include the right, but not the obligation, of the lessor to maintain and operate the airport. It should also include the right of the airport sponsor to close airport facilities for construction, special events or the public's safety as well as conduct aeronautical activities on the property. The lessor should also maintain the right to relocate or acquire and remove the facilities, if needed, to develop the airport to meet the requirements of Grant Assurance 5: Preserving Rights and Powers.

### *Force Majeure*

The force majeure provision of an airport lease addresses unavoidable causes, typically for the delay of capital projects due to acts of God and natural disasters. This clause is particularly important if the lease includes a schedule for completion of improvements by the lessee or airport sponsor.

### *Disposition of Improvements Upon Lease Termination*

For facilities constructed by a private investor on leased airport property, the lease must address the disposition of the improvements at the conclusion of the lease and any option periods. Traditionally, leases were written so the improvements reverted to the ownership of the airport sponsor. This provision is still used by many airport sponsors. The primary challenge with reversion clauses is that in the final years of the lease, the lessee does not have an incentive to continue good maintenance of the facility. Depending on the length of the lease and the expected life of the facility, some airport sponsors include the requirement for the lessee to remove the improvements and return the property to predevelopment conditions, unless the airport sponsor allows the improvement to remain and be turned over to airport ownership. Including the removal language provides the airport sponsor the potential benefit of reversion of the asset as well as protection, if the asset is in poor condition and needs to be removed. This provides some incentive for the lessee to maintain the property, because the lessee would ultimately bear the removal costs.

Another variation used by some airports at lease termination is to allow the lessee to remove or sell the improvements, with the airport sponsor having the right of first refusal to acquire the improvements at an agreed-on price. *ACRP Report 47* includes several case studies. One of the case studies includes an airport that becomes 75 percent vested in the improvements to the property over the lease period, with the lessee retaining 25 percent interest at the termination

of the lease. In this example, the airport sets aside funds to acquire the remaining 25 percent interest if the tenant wishes to vacate the facility. However, by the tenant retaining an interest in the facility, it has an incentive to continue the maintenance and upkeep, because that would maintain or increase the tenant's asset value.

The rental agreement should stipulate the specific steps and what will occur at the end of the lease term, so that there are no misunderstandings regarding the return of the rental space to the lessor.

### *Governing Law*

The lease should specify the state laws that will govern the agreement. This is typically the state in which the airport is located.

### *Other Legal Clauses*

Other legal clauses typically included in a lease agreement include the invalidity of clauses (if a portion of the lease is found invalid, the remaining portions will remain in effect), paragraph headings (as a guide, not part of the context of the agreement), relationship of parties, corporate tenancy, attorney's fees, entirety of agreement (any changes only by written agreement) and gender neutrality of terms. The responsibility for attorney fees associated with enforcing the agreement should be documented in the agreement.

The lease should also indicate the manner in which any legal matters will be settled related to the lease, such as arbitration or waiver of jury trial. The lease should also specify the responsibility for legal fees in the event legal action is required.

### *Amendments*

The lease should indicate that any changes will occur in writing, typically in the form of an amendment. It may also indicate that if the lessor elects to waive a requirement, this action does not change the lessee's other responsibilities.

When there are changes to a lease, they should be documented as an amendment to the original lease and identify what terms changed and what terms are the same.

### *Notice*

The provision for how notice is to be provided, and to whom it is to be provided, should be part of the hangar rental lease agreement. Updating this information when it changes should be a requirement included in the lease agreement.

### *Signatures*

The signature section should include the signature, printed name of the signatory and the title of the signatory for the lessor and lessee. It may also include a section to allow a witness to attest to the signatures.

## 3.7 Airport Operations Documents

### Key Insights

*While not encouraged by the FAA, through-the-fence access to GA airports is not a violation of grant assurances, provided the FAA-required terms are met.*

*An airport's minimum standards provide a "level playing field" for businesses to operate and compete at an airport.*

*Airport rules and regulations provide the baseline for the conduct of businesses and tenants at the airport.*

### Key Definitions

**Aeronautical activity**: Any activity that involves, makes possible or is required for the operation of aircraft or that contributes to or is required for the safety of such operations.

**Federal grant assurance**: A provision of a federal grant agreement to which the recipient of federal airport development assistance has agreed to comply.

**Fixed-base operator (FBO)**: A commercial business granted the right by the airport sponsor to operate at an airport and provide aeronautical services, such as fueling, hangaring, tie-down and parking, aircraft rental, aircraft maintenance, flight instrument, etc.

**Minimum standards**: Sponsor-established minimum service levels and development space requirements for commercial aeronautical activities at the airport.

**Rules and regulations**: The document adopted by the airport sponsor to govern the general conduct of the public, tenants, employees and commercial users of the airport.

**Specialized aviation service operator (SASO)**: Sometimes known as single-service providers or special FBOs, performing less than full service. These types of companies differ from a full-service FBO in that they typically offer only specialized aeronautical service, such as aircraft sales, flight training, aircraft maintenance or avionics services.

**Through-the-fence**: Access to the airfield granted by the sponsor of a public airport to a person or business that owns property adjacent to the airport for the person's or business's aircraft, or authorized aircraft to taxi onto and use the airport.

### Minimum Standards

In accordance with the Airport and Airway Improvement Act of 1982, U.S.C. Title 49 and the AIP sponsor assurances, the owner or operator of any airport that has been developed or improved with federal grants or conveyances of federal property assistance is required to operate the airport for the use and benefit of the public and to make it available for all types, kinds and classes of aeronautical activity. *ACRP Synthesis 74: Combining Mixed-Use Flight Operations Safely at Airports* discusses the challenges with accommodating multiple classes of aeronautical activity, except seaplanes, at an airport. *ACRP Synthesis 61: Practices in Preserving and Developing Public-Use Seaplane Bases* specifically addresses seaplanes.

These federal obligations involve several distinct requirements, the most important of which is that the airport and its facilities must be available for public use as an airport. The terms imposed on those who use the airport and its services must be reasonable and applied without unjust discrimination, whether by the airport sponsor or by a contractor or licensee that has

been granted a right by the sponsor to offer services or commodities normally required to serve aeronautical users of the airport.

Minimum standards assist an airport in meeting its grant assurances and protect airport businesses from unfair competition.

The establishment of minimum standards at an airport, while optional, is highly recommended by the FAA as a means for airports to minimize the potential for violations of the grant assurance at small airports that have accepted federal funding. FAA Advisory Circular 150/5190-7: Minimum Standards for Commercial Aeronautical Activities provides basic information about the FAA's recommendations for commercial minimum standards and related policies. During development of minimum standards, while not mandated by the FAA, it is recommended that the FAA be provided an opportunity to review and comment on the minimum-standards document prior to adoption. Additionally, the minimum standards should be incorporated into lease documents by reference.

The FAA's objective in recommending the development of minimum standards serves to promote safety in all airport activities, protect airport users from unlicensed and unauthorized products and services, maintain and enhance the availability of adequate services for all airport users, promote the orderly development of airport land and ensure efficient operations. Therefore, airport sponsors should strive to develop minimum standards that are fair and reasonable to all aeronautical service providers at airports and that are relevant to the aeronautical activity to which they are applied. Any use of minimum standards to protect the interests of an exclusive business operation may be interpreted as granting an exclusive right—a potential violation of the airport sponsor's grant assurances and the FAA's policy on exclusive rights.

The minimum standards should describe for each class of commercial operation on the airport the minimum levels that must be met to operate at the airport. *ACRP Legal Research Digest 11: Survey of Minimum Standards: Commercial Aeronautical Activities at Airports* explores current practices in the area of minimum standards. These minimum standards typically include the following:

- The amount of land required to be leased
- The size of the building to be constructed or leased, with the required amount of office space, public areas including restrooms, and storage and shop areas
- The size of the aircraft parking area
- The minimum number of employees and their required licenses or certifications
- The required hours of operation
- The number of vehicular parking spaces
- The types of services required and allowed to be provided for each class of operator
- The number of aircraft to be owned or leased by the operator
- The insurance requirements for each type of operation

These minimum standards should not be developed as one size fits all; they should be tailored to the size and type of operations at the airport. For example, a full-service FBO will need more land, hangars and office space and may be required to offer more services than an SASO would. Therefore, separate minimum standards should be set for each class of business.

When developing minimum standards, consider the following:

- Apply standards to all providers of aeronautical service, with standards right-sized to each type or class of business at, or potentially at, the airport. The minimum standards for a full-service FBO will differ from a single-service provider, but each provider within the respective class must meet the same standards.
- Impose conditions that ensure the safe and efficient operation of the airport per FAA rules, regulations and guidance.
- Ensure that standards are reasonable—not unjustly discriminatory—attainable and uniformly applied to protect the aeronautical service providers that make the investment to meet the minimum standards from competition that is not making a similar investment.

- Ensure that standards are relevant to the activity to which they apply.
- Ensure that standards provide the opportunity for newcomers that meet the minimum standards to offer their aeronautical services within the market demand for such service.
- Ensure the minimum standards also protect the rights of aircraft owners to conduct permitted activities on their aircraft.

FAA Advisory Circular 150/5190-7 includes questions and examples to help develop and implement minimum standards. FAA Order 5190.6 Appendix O contains sample minimum standards. *ACRP WebResource 6* also includes a sample minimum standards document that can be edited to fit your airport.

## Rules and Regulations

Rules and regulations are typically developed and adopted to provide for the operation and management of the airport, to ensure the adequate protection of the health, safety and welfare of the traveling public, airport tenants and area residents. Because the people using the airport may not be lessees or bound by other legal documents, it is advisable to institute rules and regulations to control the conduct of these individuals. The rules and regulations should be adopted by ordinance to make them enforceable and be incorporated into lease documents by reference.

The rules and regulations can be wide-ranging and generally address items such as:

- Public parking areas
- Smoking and nonsmoking areas
- Abandoned vehicles and aircraft
- Security badging requirements
- Operation of vehicles on the airport and driver training requirements
- Aircraft operations (although these cannot conflict with federal regulations)
- Aircraft tie-down requirements
- Engine run-up areas
- Safety hazards
- Matters of personal conduct

FAA Order 5190.6 Appendix P contains sample rules and regulations. *ACRP WebResource 6* (crp.trb.org/acrp0132) contains sample rules and regulations that can be edited to help develop airport rules and regulations.

## Through-the-Fence Operations

While through-the-fence operations are discouraged by the FAA, they are permitted subject to Section 136 of the FAA Modernization and Reform Act of 2012 and FAA Order 5190.6, Section 12.7. For residential through-the-fence access, GA airports may enter into an agreement with property owners, or an association representing property owners, provided the agreement complies with the specific terms and conditions of the law. The airport sponsor's primary obligation remains to serve the interest of the aeronautical public.

The obligation to make an airport available for the use and benefit of the public does not require the airport sponsor to permit ground access by aircraft from adjacent property.

Airport sponsors considering a through-the-fence agreement need to work with the FAA to ensure their proposals are as follows:

- Are consistent with current and future plans for the airport
- Comply with the terms and conditions of Section 136
- Do not impede the sponsor's ability to comply with its federal grant assurance

If through-the-fence access is established, or for such access already in place, it must meet the following conditions:

- There must be a written agreement that:
  - Identifies the duration of the agreement, the rights conveyed (which cannot be more favorable than those received by on-airport tenants) and the responsibilities of the user and airport sponsor;
  - Includes legal indemnification for noise and emissions and waives the right to bring action against the airport;
  - Includes a hazard removal clause;
  - Requires the user to comply with airport rules and regulations;
  - Imposes any special rules on fly-in guests;
  - For residential through-the-fence, prohibits the provision of aeronautical services, unauthorized users to pass through the property to access the airport, and the sale of fuel;
  - Allows the airport sponsor to terminate the agreement for a breach of the agreement or violation of rules and regulations; and
  - Identifies the access point(s).
- Through-the-fence users must bear the cost of building and maintaining the infrastructure the airport sponsor determines is necessary for access to the airfield.
- Users must pay access charges similar to those charged to tenants and operators making similar use of the airport. The agreement should specify the fee, schedule and method of collection.
- The agreement must address whether the transfer of rights is allowed. The FAA encourages the transfer to not be allowed and, rather, if an owner sells his or her home, a new agreement be executed between the airport sponsor and the new owner desiring through-the-fence access.

The FAA Residential Through-the-Fence Access Toolkit provides numerous resources for airport sponsors considering through-the-fence operation or desiring to bring existing through-the-fence operations into compliance with current law. *ACRP Report 114: Guidebook for Through-the-Fence Operations* also provides guidance and includes a worksheet for assessing through-the-fence operations.

## 3.8 Complaints Under FAR Parts 13 and 16

Airports of all sizes are subject to the filing of FAR Parts 13 and 16 complaints if they are in noncompliance with the grant assurances or property deed restrictions.

There are two types of complaints that can be filed against an airport sponsor. Airport complaints are for issues dealing with compliance with federal obligations usually contained within the grant assurances or property deed restrictions. While not common, if a complaint is filed against an airport, it will cost the airport operator time and, likely, money for legal services. Compliance with the grant assurances helps an airport minimize complaints.

Complaints made under FAR Part 13 are referred to as informal complaints, and FAR Part 16 complaints are referred to as formal complaints. They differ in the FAA staff (regional versus headquarters) that reviews the complaint, the process and timelines. The FAA Complaints About Airport Compliance web page offers additional information about the two forms of complaints and the associated processes.

### Key Insights

*An airport manager should strive to address issues before they arise to a complaint level.*

*Meeting the grant assurances and property deed restrictions and uniformly applying all airport rules and regulations, the minimum standards for commercial aeronautical activities and lease requirements and obligations will assist the sponsor in avoiding complaints.*

*The complaint process is contained within FAR Parts 13 and 16.*

### Key Definitions

**Federal Aviation Regulation (FAR) Part 13 (14 CFR Part 13)**: An informal airport complaint process.

**Federal Aviation Regulation (FAR) Part 16 (14 CFR Part 16)**: A formal airport compliance process.

### FAR Part 13 Informal Complaints

FAR Part 13: Investigative and Enforcement Procedures complaints may be made to, and are handled by, the governing FAA Airports district or regional office. Any violation of the Federal Aviation Act of 1958, as amended; the Hazardous Materials Transportation Act, relating to the transportation or shipment by air of hazardous materials; the Airport and Airway Development Act of 1970; the Airport and Airway Improvement Act of 1982, as amended by the Airport and Airway Safety and Capacity Expansion Act of 1987; or any rule, regulation or order issued thereunder should be reported to appropriate personnel of any FAA regional or district office.

The FAA published a memorandum outlining the procedures for accepting and investigating 14 CFR Part 13 complaints. The full procedures for Part 13 complaints are in 14 CFR Part 13: Investigative and Enforcement Procedures. A summary of the process is contained below.

#### *Complaint Content*

The FAA will accept a Part 13 complaint verbally or in writing. However, complainants are encouraged to initiate their complaints in writing, because a telephone conversation may not capture all the details of the allegations. Each report made under this part, and any other

information the FAA may have that is relevant to the matter reported, will be reviewed by FAA personnel to determine the nature and type of any additional investigation or enforcement action the FAA will take. The complaint should:

- Clearly identify the airport sponsor against which the allegations are made;
- Clearly identify the assurance(s) or surplus property deed restrictions alleged to have been violated;
- Provide a comprehensive, detailed description of the actions and inactions taken by the airport sponsor that resulted in the alleged violation; and
- Provide, issue-by-issue, supporting arguments, information and documentation.

### *Complaint Investigation*

Once the initial review is done by the investigating office, the airport sponsor will be notified by letter of the complaint and asked to respond to each allegation. The investigating office should include a copy of the complainant's package as an enclosure to this letter. A copy of the complaint notification letter should be sent to the complainant. If the complainant has requested anonymity, a copy of the complaint letter will not be sent to the sponsor as an enclosure. The complaint notification letter will request the airport sponsor respond within 15 to 30 days from the date of the letter, depending on the urgency or complexity of the complaint.

Upon receipt and review of the complaint, the airport sponsor may take one of several options, including the following:

- Requesting a time extension to respond
- Requesting a meeting with FAA staff to further discuss the complaint
- Requesting additional information or providing a response to the complaint

The response may address reasons why the sponsor believes it is not out of compliance, or it may detail the steps the sponsor will take to regain compliance.

During the investigative phase, the investigating office will review the airport sponsor's response and its obligating documents (such as grant agreements and surplus property deeds). The role of the investigating office is to separate the facts from any unsubstantiated allegations. To do this, the investigating office may take one or more actions, including a site visit, discussions with the parties to the complaint separately or jointly, or an attempt to obtain additional evidence.

In some cases, the investigating office may be able to assist the parties in resolving the dispute through mediation. If the facts do not support the allegations of noncompliance, and the investigating office is able to identify options that might resolve the complaint in a manner that is satisfactory to both parties and consistent with the sponsor's federal obligations, the investigating office may mediate the complaint or encourage the parties to seek an independent outside mediator.

### *Conclusion of Investigation*

Upon completion of the investigation, the investigating office will notify the parties of the conclusions reached by the FAA. The office may issue a compliance dismissal letter, if the investigation concludes that no further FAA action is warranted, or a notice of potential noncompliance if it appears that the airport sponsor may be violating its federal obligations. All compliance dismissal letters and notices of potential noncompliance will state that this is not a final agency decision subject to judicial review. They will also state that the complainant may file a formal complaint under FAR Part 16 to pursue a final agency decision appealable to the courts of appeals.

### *Stale Complaint*

An FAR Part 13 informal complaint that has been inactive for 2 or more years is considered stale. Any complainant who lacks interest or abandons the complaint is recognized as having a stale complaint. Stale complaints may be archived or discarded with no follow-up. The FAA Office of the Chief Counsel will not docket stale complaints for formal review under FAR Part 16, unless the complainant can demonstrate recent substantial and reasonable, good-faith efforts to resolve the disputed matter informally and that there appears to be no reasonable prospect for a timely resolution of the dispute.

## FAR Part 16 Formal Complaint

Resolving an FAR Part 16 formal complaint process is complex and can be very daunting and stressful. In some respects, it can be likened to a civil lawsuit, with FAA legal counsel being the hearing officer. In fact, if the matter is not resolved through the formal complaint process, the complaint could end up in a federal court of appeals for resolution. Resolving the complaint can also be very time consuming. In many cases, the respondent may need to engage legal representation, which can be costly. For these reasons, every effort should be made to resolve the complaint during the Part 13 process. 14 CFR Part 16: Rule of Practice for Federally Assisted Airport Enforcement Proceedings describes the formal complaint process, which is summarized below.

When a resolution cannot be reached under the informal proceedings of FAR Part 13, an action may be filed under FAR Part 16. Prior to filing a complaint under this part, a person must show the following:

- To have been directly and substantially affected by the alleged noncompliance.
- To have engaged in good-faith efforts to resolve the disputed matter informally with those individuals or entities believed responsible for the noncompliance.
- There is no reasonable prospect for practical and timely resolution of the dispute.

The efforts at informal resolution may include, without limitation, mediation, arbitration, or the use of a dispute resolution board or other form of third-party assistance. The FAA ADO, field office or regional office responsible for administering financial assistance to the sponsor or the FAA Office of Civil Rights will be available on request to assist the parties with informal resolution.

### *Complaint Content*

Complaints filed under FAR Part 16 shall state the name and address of each person who is the subject of the complaint and the provisions of each act that the complainant believes were violated, including all documents then available in the exercise of reasonable diligence, to be offered in support of the complaint and to be served upon all persons named in the complaint as persons responsible for the alleged action or omission upon which the complaint is based. The complaint must also provide a concise but complete statement of the facts relied on to substantiate each allegation and describe how the complainant was directly and substantially affected by the things done or not done by the respondents. The burden of proof is on the complainant to show noncompliance with any act or any regulation, order, agreement or document of conveyance issued under the authority of an act.

### *Responding to a Complaint*

Within 20 days after the receipt of the complaint, unless a motion has been filed under FAR §16.26, the director will dismiss a complaint or any claim made in a complaint with prejudice, if it appears on its face to be outside the jurisdiction of the administrator or it does not state a

claim that warrants an investigation or further action by the FAA. The complaint may also be dismissed if the complainant lacks standing to file a complaint. A dismissal under this section will include the reasons for the dismissal. If a complaint is not dismissed, the FAA notifies the complainant and respondent in writing within 20 days after the date the FAA receives the complaint that the complaint has been docketed. The respondent shall file an answer within 20 days of the date of service of the FAA notification.

The answer must contain a concise but complete statement of the facts relied on to substantiate the respondent's answers and should be accompanied by supporting documentation. The answer should deny or admit the allegations made in the complaint. It can also state that the person filing the document is without sufficient knowledge or information to admit or deny an allegation, and can assert any affirmative defense. The respondent's answer may include a motion to dismiss the complaint, or any portion of it, with a supporting memorandum of points and legal authorities.

FAR Part 16 allows the complainant and the respondent one additional response. The complainant may file a reply within 10 days of the date of service of the respondent's answer. Once the respondent receives the complainant's reply, he or she may file a rebuttal within 10 days of the date of service. Like the answer, the reply and rebuttal should each contain a concise but complete statement of the facts relied on to substantiate the answers and should be accompanied by supporting documentation.

### *Complaint Investigation*

If there appears to be a reasonable basis for further investigation, the FAA Office of Airport Compliance and Management Analysis will investigate the subject matter of the complaint. The investigation may include one or more of the following: (1) a review of the written submissions of the parties, information gathered by the FAA's investigation of the matter or information furnished by the parties at the FAA's request; (2) oral and documentary evidence obtained through the FAA's use of its authority to compel production of such evidence; and (3) conduct of, or requirement that a sponsor conduct, an audit of airport financial records and transactions.

In some cases, the FAA may initiate its own investigation without having received a complaint. In this case, the FAA sends a notice that sets the areas and the reasons for the investigation to each person subject to the investigation. Each party must respond to the FAA within 30 days from the date of service.

### *Complaint Determination*

The director's determination is an initial, nonfinal agency decision based on the record that contains a concise explanation of the factual and legal basis for the director's decision. The decision will be provided to each party within 120 days of the date that the last pleading was due.

Any party adversely affected by the director's determination may appeal the initial determination to the associate administrator for airports within 30 days after the date of service of the initial determination. The other party may file a reply to an appeal within 20 days after the date of service of the appeal. Appeals and replies should include the arguments of the parties concerning affirmance or reversal of the initial director's determination. If the initial determination finds the respondent airport in noncompliance and proposes to issue a compliance order, the initial determination will include a notice of opportunity for a hearing, if a hearing is required by statute.

The associate administrator may issue a final agency decision on appeal from the director's determination, without a hearing, in cases in which (1) the complaint is dismissed after investigation; (2) a hearing is not required by statute and is not otherwise made available by the FAA; or (3) the FAA provides the respondent an opportunity for a hearing, and the respondent waives

the opportunity for a hearing. In such cases, the final agency decision will be issued within 60 days after the due date of the reply.

Also, in cases in which no hearing is available or the opportunity is waived, if an appeal is not filed within the 30-day time period, the director's determination becomes the final decision and order of the FAA.

A person may seek judicial review of an FAA final agency decision and order in a federal appeals court. A petition for review must be filed not later than 60 days after the final decision has been served on each party. Many agency decisions are not considered final and, therefore, are not subject to judicial review. For example, the following do not constitute final decisions and orders: (1) an FAA decision to dismiss a complaint without prejudice, (2) a director's determination, (3) an initial decision issued by a hearing officer at the conclusion of a hearing and (4) a director's determination, or an initial decision of a hearing officer, that becomes a final decision of the associate administrator because it was not appealed within the applicable time limits.

## 3.9 Insurance

### Key Insights

*Insurance is a risk management tool.*

*Aeronautical activities may not be covered by your airport sponsor's insurance. Understand what is covered and what additional insurance coverage is needed.*

*Construction and project insurance is complex and should be evaluated on a project-by-project and stand-alone basis. Some risk aspects can be pushed down to contractors.*

### Key Definitions

**General liability insurance**: A standard insurance policy issued to businesses to protect them against liability claims for bodily injury and property damage.

**Insurance broker**: An insurance intermediary that represents the insured.

**Liability limit**: The set amount beyond which an insurance company is not liable for payments due to a third party. The insured remains legally liable above this limit.

**Loss**: The basis for claim for damages under the terms of a policy.

### Primary Insurance Criteria and Areas of Importance

Among airports, despite the substantial importance that risk has on their operations, airport insurance may remain a rather ambiguous and misunderstood matter. While an insurance expense is frequently seen as necessary but undesirable, it is crucial for airport managers to understand the function of airport insurance in financial risk mitigation. Insurance is not the sole means of mitigating financial risks to the airport, but it is designed to work with other safety and risk management techniques. For each airport, when buying insurance coverage, the key is to identify the sources and likelihood of risk exposure, identify and address any shortcomings in how this risk exposure can be mitigated by other practices (e.g., airport driver training or the implementation of safety risk management or safety management systems) and then cover the risk mitigation shortfall with insurance.

When selecting airport insurance, airport managers should focus on balancing the three primary criteria: price, coverage and risk exposure. *ACRP Synthesis 30: Airport Insurance Coverage and Risk Management Practices* lists the following primary areas of risk concern for airports of all sizes, discovered as a part of the project's study: general liability, construction and business interruption. For the small airport operators surveyed, general liability and automobile liability were listed as two high-risk exposure concerns. Business interruption and environmental considerations were listed as a concern by less than half of those small airports surveyed.

### Common Types of Insurance for Airports

The study behind ACRP Synthesis 30 also found that smaller airports tend to purchase a wide variety of coverage types, such as property insurance, car liability, business interruption, general liability, workers' compensation and employment practices liability. This could be, in part, due

to the ability of larger airports to self-insure. A commercial general liability insurance policy may include coverage for the following:

- **Premises liability**: Coverage for bodily injury and property damage that arises from the use of the airport premises and any or all operations at the airport.
- **Products/completed operations**: Coverage for damages or loss arising from the use of products or services rendered by the airport, as a result of product or material fault or negligence.
- **Personal/advertising injury liability**: Coverage for injury arising as a result of offenses committed during the conduct of airport business that result in or include such actions as wrongful eviction, slander, violation of a person's rights or copyright infringement.
- **Contractual liability insurance**: Coverage protecting the airport from risk arising from the airport's violations of contracts or agreements.
- **Premises medical coverage**: Coverage intended to address emergency medical expenses, such as co-payments and deductibles, which arise from injury caused by airport operations.
- **Property insurance**: Coverage to provide protection of airport property and its contents if damaged and resulting in the loss of use of the property.
- **Hangar keeper's liability**: Coverage for damage or loss of aircraft that are on the airport premises while in the custody of the airport for the purposes of storage or repair.
- **Independent contractors' liability**: Coverage for losses or damages caused by an independent contractor operating on the airport's behalf. For the purposes of insurance, an independent contractor's liability coverage may be adjusted to cover a broad range of service providers not employed by the airport or its sponsor.
- **Environmental liability**: A form of business insurance providing coverage for companies to protect them from uninsured environmental liabilities.

In addition to the risk mitigation offered by general liability insurance, workers' compensation is highly recommended as a risk mitigation tool and may be required by state law, in addition to other types of insurance. Workers' compensation insurance provides wage replacement and medical benefits to employees who were injured during employment. Airport environments, and the physical impacts of many on-airport tasks, place a higher degree of injury on airport employees in the course of performing their day-to-day duties and make workers' compensation insurance a valuable risk mitigation tool. Moreover, in many states, workers' compensation insurance is a required coverage for all entities that exceed a threshold of full-time-equivalent positions. Airport managers should check state laws and availability of this coverage from the airport sponsor.

Public officials' errors and omissions insurance is a type of liability insurance that provides risk mitigation for airports owned and operated by local governments. The insurance provides coverage for damages or litigation costs for claims against public employees. Within certain policies, it provides coverage for volunteers providing services on behalf of the airport. The coverage is intended to mitigate financial risk on types of claims generally made in connection to wrongful acts committed by public officials in the performance of their duties to a public entity. Although local governments have some statutory immunities, public officials can be held liable for their negligent actions in the course of their duties. This coverage typically protects not only the public official or employee but the public entity itself, if it is made part of the legal proceedings.

While many may not regard small airports as business entities, aviation facilities large and small rely heavily on revenue from rents, fuel sales and profit sharing with on-airport businesses to meet their needs and expenses in the short- and long-term future. As such, business interruption insurance is intended to mitigate the risk of income losses that may occur as a result of a natural or man-made disaster. Because of a variety of policy coverages and ranges, these types of policies should be evaluated on an airport-by-airport basis.

In the construction contract, airport owners should consider requiring the contractor to name the owner and engineer as an additional insured on their construction policy. This typically can be added at a low or no cost. For certain airport construction projects, airport managers should consider procuring a builder's risk or owner-controlled insurance program, which is most commonly used at large airports. This type of insurance is a focused policy package that is held by and covers the airport during the project construction. The policy usually contains general liability, workers' compensation, employers' liability, and in certain cases, excess insurance. Depending on the size and scope of the project, the policy package will vary and should be evaluated on a case-by-case basis.

The insurance types and coverages just described are intended to mitigate the risk of normal airport operations. For special events, such as airshows, separate insurance is typically obtained, based on the type of event.

## Minimizing the Insurance Expense

If the small airport's insurance coverage is not included as part of its sponsor agency's coverage, the cost of individual airport coverage may become financially prohibitive or impact other expense categories. When trying to minimize the expense and cost of the airport insurance policy, consider the following suggested best practices:

- Check for coverage eligibility with your airport sponsor or your state aeronautics agency. In certain locations, airport insurance can be purchased from the state, which in turn is a self-insured entity.
- Evaluate and increase deductible levels, because deductible costs are easier to raise than that of the entire liability.
- Work closely with the insurance agent or broker to identify all pertinent steps your airport sponsor can take to reduce risks that would be reflected in the rates.
- Shop for coverage each year to evaluate the cost of the existing policy versus competition.
- Strengthen the risk manager's role to allow your staff members more leverage and leeway in evaluating the various areas of risk, conducting risk assessments and recommending appropriate coverage types and levels.
- Closely examine and evaluate the risks that your facility is exposed to, the likelihood and severity of damage and the need for various coverage types. As disclosed in *ACRP Synthesis 30*, small airports typically tend to be coverage heavy, with too many coverage types.

Generally, small airports do not have the fiscal assets or leverage to be self-insured, so an insurance policy becomes a necessity.

## 3.10 Grants and Capital Improvement Funding

### Key Insights

*Reach out to the FAA or state block grant staff to establish a connection to help the airport with the grant process.*

*Various sources of federal and state grants are available to assist small airports in addressing their planning, development and safety needs. You need to be highly familiar with the various types of federal grants and the key requirements for each of the funding sources in order to maximize your share of the funds.*

*Annually, airports in the NPIAS submit a capital improvement program (or similarly titled document) with the AIP and/or state or local funding requests for the next 5 years.*

*For nonprimary airports to receive the full $150,000 nonprimary airport entitlement, there must be at least $750,000 of AIP-eligible needs in the 5-year program, and the AIP funding level must meet the minimum appropriation level.*

*The FAA uses a numerical national priority rating as a tool for prioritizing airport development. This numerical rating takes into account the type of airport, project purpose and type of project.*

*State airport grant programs vary. You must closely coordinate with your state aeronautics agency to identify potential additional sources of capital improvement program funding, because nontraditional sources of funding for specific projects (such as airport security) may be available.*

*Early planning and coordination with the granting agency increases the opportunity for successfully having a project funded, especially when validated with an independent fee estimate.*

### Key Definitions

**Airport Improvement Program (AIP)**: A program that provides financial grants to primarily public agencies for the planning and development of public-use airports that are included in the National Plan of Integrated Airport Systems.

**Airport layout plan (ALP)**: A set of drawings that provide a graphic representation of the sponsor's long-term development plan for an airport, including property boundaries, existing and proposed airport facilities and structures, and the location of existing and proposed non-aeronautical areas.

**Airports Capital Improvement Plan (ACIP)**: A document prepared by the airport sponsor on an annual basis that represents the airport sponsor's 5-year program for capital development at the airport. Also referred to as a capital improvement program or transportation improvement program.

**Bond**: A debt investment in which an investor loans money to an entity that borrows the funds for a defined period of time at a specified interest rate. Common forms used by government entities to borrow money to finance a project include general obligation and revenue bonds.

**Discretionary funds**: Airport Improvement Program funds remaining within the obligation limitation, after entitlement calculation, subject to restrictions in legislation and available for distribution at the FAA's discretion, per the FAA priority system.

**Entitlement funds**: A set minimum level of Airport Improvement Program funding for an airport, based on the FAA's criteria. The minimum differs for primary and nonprimary airports

based on enplanement levels for primary air carrier airports and standard allocation for each nonprimary airport.

**Grant assurances**: Obligations undertaken by the airport sponsor when it accepts funds from the FAA-administered airport financial assistance program.

**National Plan of Integrated Airport Systems (NPIAS)**: Public-use airports considered necessary to provide a safe, efficient and integrated system of airports to meet the needs of United States civil aviation, national defense and the U.S. Postal Service.

**Set-aside funding**: Minimum percentages or amounts that represent requirements for dedicated AIP funding, including funding of noise-compatibility projects, military airport programs, certain reliever airports and projects for capacity, safety and security.

**State apportionment**: Available for all airports within a state, excluding primary airports but including reliever and nonprimary commercial service airports, with the available funds being apportioned for airports within that state, on the basis of the state's proportional population to the total population of the eligible states and the state's proportional area to the total area of the eligible states. Only in block grant states are the state apportionment funds apportioned to the state. In non–block grant states, FAA Airports programs and disburses the funds, but the state may provide input into programming, along with using the FAA priority system.

## AIP Grant Funding

For small airports within the NPIAS, AIP funds are an important funding source for capital improvements. AIP is a federal grant-in-aid program, which serves as a key source of funding for airport development and planning projects. The program was originally put in place in 1982 under the provisions of the Airport and Airway Improvement Act. The program funds originate from the Airport and Airway Trust Fund, which draws funding support from fuel taxes, user taxes (fees) and other revenue sources. The intent of the program is to cover airport improvement expenses related to enhancing airport safety, capacity and security and addressing environmental concerns.

The FAA refers to recipients of AIP grants as "sponsors." Airport sponsors may use AIP funds for eligible airport capital improvements, justified land acquisitions and the acquisition of approved safety equipment. The program provides funding for up to 90 percent of eligible expenses at smaller airports and 75 percent at medium- and large-hub airports. At airports with essential air service and in economically distressed areas, the federal share of the allowable costs can be increased from 90 percent to 95 percent. The communities that qualify for this increase are identified on the FAA Economically Distressed Communities Special Rule web page. The federal share can also be greater than 90 percent in states that have larger amounts of public land, as identified in Table 4-8: Federal Shares by Airport Classification in Public Land States of FAA Order 5100.38: Airport Improvement Program Handbook. The FAA must have authorization and appropriation to award grants.

FAA Order 5100.38 provides the guidance to implement the AIP grant program. It defines the eligible projects, eligible costs and associated processes. While written for FAA staff to implement the AIP grant program, it is useful to airports and their consultants to appropriately formulate eligible projects. Table 7 identifies eligible and ineligible categories of projects for all NPIAS airports.

The FAA Central Region has an AIP Sponsor Guide web page that contains information and tools to help an airport sponsor navigate through the AIP grant process. One of those useful tools is a Checklist for Typical AIP Development Projects that identifies all the steps in the multiple

**Table 7. AIP-eligible and AIP-ineligible projects for all airports.**

| Eligible Projects | Ineligible Projects |
|---|---|
| Airfield drainage | Artwork |
| Airfield lighting | Development that exceeds FAA standards |
| Apron construction/rehabilitation | Development for exclusive use |
| Environmental studies | Improvements for commercial enterprises |
| General aviation terminal buildings | Industrial park development |
| Land acquisition | Landscaping |
| Certain navigational aids (e.g., REILs, PAPIs) | Maintenance equipment (e.g., mowers) |
| Planning studies | Marketing plans |
| Runway construction/rehabilitation | Office equipment |
| Safety area improvements | Training |
| Taxiway construction/rehabilitation | Airport operations costs |
| Weather observation stations (e.g., AWOS) | FBO support areas |
| | Airport vehicles |

Source: FAA Airports Division Central Region, AIP Sponsor Guide-100, June 28, 2013

phases of obtaining and executing a project under the AIP. To assist FAA staff and airport sponsors in executing a project within the AIP program, FAA Airports has developed standard operating procedures (SOPs) and fillable tools related to the SOPs.

### *Formula and Discretional Funds*

AIP grants are distributed as two types of funds: formula and discretionary. Formula funds, often referred to as entitlements, include the major entitlement categories—such as primary, cargo, state apportionment and nonprimary—and Alaska supplemental funds:

- Primary entitlement: Based on the enplaned passengers at primary airports, less turnback by large- and medium-hub airports with passenger facility charges. Minimum annual entitlement is $1 million, based on AIP meeting minimum appropriation level.
- Cargo entitlement: Based on landed cargo.
- State apportionment: Available for all airports within a state, excluding primary airports but including reliever and nonprimary commercial service airports, with the available funds being apportioned for airports within that state, on the basis of the state's proportional population to the total population of the eligible states and the state's proportional area to the total area of the eligible states. Only in block grant states are the state apportionment funds apportioned to the state. In non–block grant states, FAA Airports programs the funds, but the state may provide input into programming, along with using the FAA priority system.
- Nonprimary entitlement: The nonprimary entitlement category was introduced in 2012 as a part of the Wendell H. Ford Aviation Investment and Reform Act, specifically to assist NPIAS-listed nonprimary (mostly GA) airports with needed airport improvements. The program provides airports up to $150,000 annually, based on the AIP meeting minimum appropriation level, to fund eligible projects, providing the airport sponsor demonstrates the need for at least an average of $150,000 in capital needs over a 5-year capital improvement program (CIP) submittal. The airport sponsors are able to delay drawing their entitlement until the fourth year the funding becomes available, in order to accumulate funds for larger projects. The unused funds expire after 4 years, unless obligated by a sponsor to an eligible project or transferred to another NPIAS airport. There are some additional projects that are AIP eligible at nonprimary airports, and some of them are also eligible at nonhub commercial service airports, as shown in Table 8. An unclassified airport does not receive nonprimary entitlement funds; and airport managers of unclassified airports should contact their FAA ADO regarding AIP funding eligibility.

**Table 8. Additional eligible projects at nonprimary and/or nonhub airports.**

| Project Type | Airport Type |
|---|---|
| Runway, taxiway or apron pavement maintenance | Nonprimary and nonhub (excludes turf runway) |
| Terminal building | Nonhub and nonprimary public-use space |
| Nonrevenue public parking lot | Nonhub if associated with commercial service terminal building |
| | Nonprimary if associated with general aviation terminal building |
| Aircraft hangars, fixed-base operator building or aircraft maintenance building* | Nonprimary (using only nonprimary entitlements) |
| Fuel farms* | Nonprimary (using only nonprimary entitlements) |
| Wash rack | Nonprimary |

*Airport sponsor must demonstrate to the FAA that airside needs within the next 3 years will be accommodated through local or nonprimary entitlement funds.
Source: FAA Order 5100.38D: Airport Improvement Handbook, September 30, 2014

The formula funds are first taken from the AIP appropriation. Then, the discretionary programs are funded. The discretionary funds include mandatory set-aside requirements for noise mitigation, military airports and reliever airports. The remaining funds are divided to fund safety, security, capacity and noise projects and pure discretionary funding. Discretionary funding also comes from PFC turnbacks (returned funds) from large- and medium-hub airports and from rollover funds, which are entitlement grant monies that an airport elects to roll over for use in a future year. There is also a formula to ensure that a specific percentage of the returned passenger entitlement funds from large- and medium-hub airports goes to small airports.

### *State Block Grant Program*

The FAA began the State Block Grant Program (SBGP) in 1989, following the 1987 Congress authorization, and continues to implement it, per FAA Advisory Circular 150/5100-21: State Block Grant Program. The purpose of the program is to allow states to prioritize, select and fund AIP projects at other-than-primary airports. The current participants in the SBGP are as follows:

- Georgia
- Illinois
- Michigan
- Missouri
- New Hampshire
- North Carolina
- Pennsylvania
- Tennessee
- Texas
- Wisconsin

## FAA National Priority Ratings

To ensure that the AIP program is consistently applied across the country and in a manner to provide the most benefit to the NAS, the FAA developed a national priority rating system, as detailed in FAA Order 5100.39: Airports Capital Improvement Plan.

The national priority rating system is a numerical system that is the tool for prioritizing airport development. It is a formula using airport size, category of project and type of project that results in a numerical rating for a project, as shown in Figure 7. The formula was developed to align with the agency's goals and objectives. While the formula can be used to calculate a

Priority Number = .25P(A+1.4P+C+1.2T)

**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 - | 50 or 20,000 | = 4 pts |
| C - | 20 or 8,000 | = 3 pts |
| D - | <20 and <8,000 | = 2 pts |

**P = Purpose Points (0 to 10 pts)**

CA = Capacity = 7pts
EN = Environment = 8pts
OT = Other = 4pts
PL = Planning = 8pts
RE = Reconstruction = 8pts
SA = Safety/Security = 10pts
SP = Statutory Emphasis Programs = 9pts
ST = Standards = 6pts

**C = Component Points (0 to 10 pts)**

AP = Apron = 5pts
BD = Building = 3pts
EQ = Equipment = 8pts
FI = Financing = 0pts
GT = Ground Transportation = 4pts
HE = Helipad = 9pts
HO = Homes = 7pts
LA = Land = 7pts
NA = New Airport = 4pts
OT = Other = 7pts
PB = Public Building = 7pts
PL = Planning = 7pts
RW = Runway = 10pts
SB = Seaplane = 9pts
TE = Terminal = 1pt
TW = Taxiway = 8pts
VT = Vertiport = 4pts

**T = Type Points (0 to 10 pts)**

60 = Outside 65 DNL = 0pts
65 = 65 - 69 DNL = 4pts
70 = 70 - 74 DNL = 7pts
75 = Inside 75 DNL = 10pts
AC = Access = 7pts
AD = Administration Costs = 0pts
AQ = Acquire Airport = 5pts
BO = Bond Retirement = 0pts
CO = Construction = 10pts
DI = De-Icing Facilities = 6pts
DV = Development Land = 6pts
EX = Extension/Expansion = 6pts
FF = Fuel Farm Development = 2pts
FR = RW Friction = 9pts
IM = Improvements = 8pts
IN = Instrument Approach Aid = 7pts
LI = Lighting = 8pts
MA = Master Plan = 9pts
ME = Metropolitan Planning = 7pts
MS = Miscellaneous = 5pts
MT = Mitigation = 6pts
NO = Noise Plan/Suppression = 7pts
OB = Obstruction Removal = 10pts
PA = Parking = 1pt
PM = People Mover = 3pts
RF = ARFF Vehicle = 10pts
RL = Rail = 3pts
SE = Security Improvement = 6pts
SF = RW Safety Area = 8pts
SG = RW/TW Signs = 9pts
SN = Snow Removal Equipment = 9pts
SR = Sensors = 8pts
ST = State Planning = 8pts
SV = Service = 6pts
SZ = Safety Zone (RPZ) = 8pts
VI = Visual Approach Aids. Aid = 8pts
VT = Construct V/Tol RW/Vert Plan = 2pts
WX = Weather Reporting Equipment = 8pts

Source: FAA Order 5100.39A: Airports Capital Improvement Plan, August 22, 2000

***Figure 7. AIP priority equation.***

project's ranking, the FAA has also developed tables that provide the numerical rating for each type of eligible project at each size of airport, which are included in FAA Order 5100.39. Safety and security receive the highest priority, followed by the preservation of assets, with capacity-enhancement projects at a lower rating. Larger airports also have higher ratings.

## Five-Year CIP Submittal

Each year, NPIAS airport sponsors submit a 5-year CIP, the title of which may vary by state (e.g., capital improvement program, airport capital improvement program or transportation improvement program). Whatever the title, it provides the airport sponsor with the opportunity to demonstrate an average of at least $150,000 per year of AIP capital improvement needs over the next 5-year period. *ACRP Report 120: Airport Capital Improvements: A Business Planning and Decision-Making Approach* provides a cost estimation model for capital projects regularly included in a CIP and an accompanying spreadsheet model.

The CIP funding request is the tool to communicate the airport's plans to the state agency or FAA. To assist in preparing the CIP, the airport sponsor should use the airport's master plan or layout plan, environmental mitigation commitments, pavement management plans and prior year's submission. The AIP priority rating of a project should also be considered. Usually, an airport sponsor should first request funding for its highest-priority projects.

## Grant Assurance and Compliance

All FAA and state grants are subject to a set of underlying assurances and required assurance compliance. The grant assurances are used to promote national objectives by transferring associated requirements to the local community. The airport sponsor is required to commit to the grant assurances before receiving the grant. The FAA web page on grant assurances lists all 39 current sponsor grant assurances.

Some of the key grant assurances that tie directly to the AIP funding and capital projects include the following:

- The sponsor must comply with all federal laws, orders and advisory circulars.
- The sponsor meets property ownership, title and sponsor grant authority.
- The sponsor will not act to deprive itself of any rights or power to meet the conditions of the assurances.
- The project will be consistent with local plans, consider local users and interests, conform to plans and specifications, and meet minimum-wage and veterans preference requirements.
- The sponsor will act to the maximum extent feasible to promote airport land-use compatibility and remove airport hazards.

## Capital Project Scheduling

To maximize the opportunity for AIP funding, a methodical approach to capital improvement planning is needed. A methodical approach allows the airport sponsor to fulfill the FAA requirements in preparation of receiving a grant. It is a multi-stage process that involves financial and facility planning. Additional information on project implementation is included in Section 5.10: Project Implementation.

Capital improvement planning starts as part of the airport master plan or ALP process. This allows for a big-picture view and for capital projects to be prioritized. The master plan can also identify if there are enabling projects that must occur before the primary project. For example, to extend a runway, land acquisition and removal of obstructions such as roads, power lines or

### AIP SPONSOR GRANT ASSURANCES

1. General Federal Requirements
2. Responsibility and Authority of Sponsor
3. Sponsor Fund Availability
4. Good Title
5. Preserving Rights and Powers
6. Consistency with Local Plans
7. Consideration of Local Interest
8. Consultation with Users
9. Public Hearings
10. Metropolitan Planning Organization
11. Pavement Preventive Maintenance
12. Terminal Development Prerequisites
13. Accounting System, Audit and Record Keeping Requirements
14. Minimum Wage Rate
15. Veterans Preference
16. Conformity to Plans and Specifications
17. Construction Inspection and Approval
18. Planning Projects
19. Operation and Maintenance
20. Hazard Removal and Mitigation
21. Compatible Land Use
22. Economic Nondiscrimination
23. Exclusive Rights
24. Fee and Rental Structure
25. Airport Revenue
26. Reports and Inspections
27. Use by Government Aircraft
28. Land for Federal Facilities
29. Airport Layout Plan
30. Civil Rights
31. Disposal of Land
32. Engineering and Design Services
33. Foreign Market Restrictions
34. Policies, Standards and Specifications
35. Relocation and Real Property Acquisition
36. Access by Intercity Buses
37. Disadvantaged Business Enterprises
38. Hangar Construction
39. Competitive Access

Source: FAA Airports Assurances: Airport Sponsors

structures must occur first before the runway extension is constructed. The planning process can identify the grant eligibility and sequencing to accomplish the overall development goal.

Because a master plan or ALP update is typically a 20-year planning document, it also should identify the triggers for the implementation of proposed improvements. These triggers should be connected with the justification of need that the airport sponsor will be required to demonstrate to the FAA.

The FAA typically programs projects about 3 years in advance of execution. Therefore, changes to a capital plan in the next 3 years, especially for large capital projects, may be difficult for the FAA or state (for state block grants) to accommodate. This may mean a project needs to be delayed in order to be accomplished.

Even after a project is programmed by the FAA or state, it is essential that the airport sponsor obtain full airspace and environmental approval. A project needs to be shown on the ALP before it can be funded. The FAA review-and-approval process for an ALP typically provides the airspace approval for the development. Most ALPs are conditionally approved, meaning the development on the ALP has received airspace approval but it may have neither environmental approval nor sufficient justification of need to be eligible for grants. As part of the process of preparing the CIP, the national priority ranking of the project should be identified.

The environmental approval for a project must be completed a year before the anticipated funding for the construction of the project. Thus, preparation of the environmental documentation for a project should be programmed at least a couple years in advance. Environmental documentation typically is considered to have a "shelf life" of about 5 years. Therefore, it is important to do it in advance, but not too far in advance.

Identifying the national priority ranking of a project is important to know what type of AIP funding may be available for the project. Large projects with a high priority rating may compete well for discretionary funding. If a project receives discretionary funding, the FAA also expects the airport sponsor to apply its entitlement funding (nonprimary or primary) toward the project because it is a high priority. If a project does not have a high priority rating, then potentially, state apportionment or entitlement AIP funding will likely need to be used. Entitlement funding is first applied to the highest-priority project shown on the CIP for that year. Thus, it may be important to strategically order the CIP to accomplish the airport sponsor's goals. Using a consultant that understands the AIP can assist in this process.

Close communication with the airport's FAA ADO representative, or state representative in block grant states, is important in capital project planning. After the capital plan is submitted, the state aeronautics agency, or state aeronautics agency in coordination with the FAA, develops an overall state capital plan. This is done by using the national priority ranking and, for projects with similar national priority ranking, by considering other factors such as airspace and environmental approvals and justification of need, design-plan status, and financial readiness of the airport sponsor to fund the local share.

An airport sponsor is typically more successful in accomplishing a project by aligning its capital plan with the overall state plan. Through this coordination, an airport sponsor can identify its project's priority within the overall state capital plan.

The FAA programs a list of projects for potential discretionary funding each year. The amount of discretionary funding available for each year drives how many projects can get funding and the lowest priority rating that is potentially eligible for discretionary funding. If a project has a priority rating that would allow it to compete for discretionary funding, using local funding—or programming the design a year or two in advance of the anticipated construction grant—may enable a project to get on the discretionary list sooner.

Obtaining discretionary funding for a project has become increasingly difficult. While the AIP funding level has remained essentially unchanged, with inflation over time, project costs have increased in this same time period. With a fixed grant funding level, this results in the ability to fund fewer projects.

### State Grant Programs

State airport capital funding programs vary greatly from state to state in terms of program size, proportionate-share requirements, eligibility of projects and costs and much more. Some states provide operating budget funding, whereas the vast majority of other improvement programs only permit eligible capital improvement projects to be funded at public-use airports. Airport managers should coordinate closely with their state aeronautics agencies regarding program eligibility, phasing and proportionate-share requirements.

### State Loan Programs

Some states also have available a state loan program either specific for airports or for which airports are eligible. Loan programs can be useful to develop revenue-producing assets, because the revenue generated can be used to repay the loan. Many of these programs operate as revolving loan programs, meaning that as funds including interest are repaid, the monies are used to issue new loans.

### Bond Funding

While most small airports rely on AIP funding for capital development, some may have a sufficient revenue stream to also use bond funding for projects, or for the local share of large projects. There are several common types of bonds:

- General obligation bonds: General obligation bonds are issued by a governmental entity. These bonds are backed by the taxing authority of the sponsoring governmental entity.
- Revenue bonds: Revenue bonds are also issued by a governmental entity. These bonds are backed by a dedicated revenue stream, typically related to the type of project being funded, such as airport revenue for an airport project. Some revenue bonds are a hybrid, being underwritten by airport revenue but backed by sponsoring governmental entity tax revenue in the event of a shortfall.
- Special facility revenue bonds: Special facility revenue bonds are issued by a governmental entity and backed by revenue solely from the revenues of a facility constructed with the proceeds of those bonds.
- Industrial development revenue bonds: Industrial development revenue bonds are a private-purpose municipal bond, the proceeds of which are used to build a facility that is leased to a corporation. The proceeds of the lease payments by the corporation are used to pay the debt on the bonds.

When considering bonds, the cost of issuing bonds must be included in the financial planning. Some states have a state bond bank or other program that allows small governmental entities to

issue bonds as a group to obtain more favorable rates. When an airport has outstanding bonds, it is required to budget for and maintain the required bond coverage, typically the amount of the annual debt service plus 25 percent.

While focused primarily on commercial service airports, *ACRP Synthesis 1: Innovative Finance and Alternative Sources of Revenue for Airports* includes a detailed discussion on the various types of bonds. It also includes a summary of state grants and loans for aviation (as of the time of its publication) that can be a starting point for airport sponsors researching opportunities available in their state.

## Nontraditional Funding Sources

Nontraditional funding sources are also available to supplement or replace capital improvement funds in the event that the airport project meets requirements specific to the particular funding source. The following list is not all-inclusive:

- Tax increment financing (TIF): If the airport is in a TIF district, it may be able to access TIF funds to carry out landside projects. The TIF funds are sourced from business taxes in an identified tax district as a set-aside percentage of those taxes and allocated into a fund that is used for other development projects in the district.
- U.S. Department of Agriculture's Office of Rural Development: For airports in rural areas, grants and loan guarantees may be available to public bodies to enhance economic opportunities.
- U.S. Department of Commerce grants: These are job-growth-associated grants. Therefore, if the airport is building a project to secure new, local jobs, it may be eligible for these funds.
- Revolving loan funds: State or local loan funds may be available for items such as multimodal or infrastructure projects. The criteria are usually very specific to the purpose of that loan fund.
- State economic development funding: This funding could be available to improve the facility to attract new businesses or help employers grow their businesses to add jobs. Usually, those grants are targeting specific industries, such as high-tech or skilled job sectors.

The best resource to identify whether nontraditional funding sources are available and applicable for projects at your airport is to reach out to your state and local economic development agency. Many of these programs have specific requirements and may need an upfront investment to meet the program requirements.

## 3.11 Consultant Selection

### Key Insights

*Sponsors of small airports typically do not have the in-house expertise to accomplish an airport development project, so they hire consultants. There are two common types of professional services: planning and design/construction.*

*For professional services to be eligible for FAA funding or reimbursement, they need to be qualification-based for FAA requirements, with fee negotiations after selection.*

*FAA Advisory Circular 150/5100-14: Architectural, Engineering and Planning Consultant Services for Airport Grant Projects provides the requirements for consultant selection for an AIP project.*

*All qualification-based selection processes must be conducted in a manner providing full and open competition.*

*If a project is being funded with local monies, the selection must also meet local procurement requirements.*

### Key Definitions

**Consultant**: A firm, individual, partnership, corporation or joint venture that performs architectural, engineering or planning services.

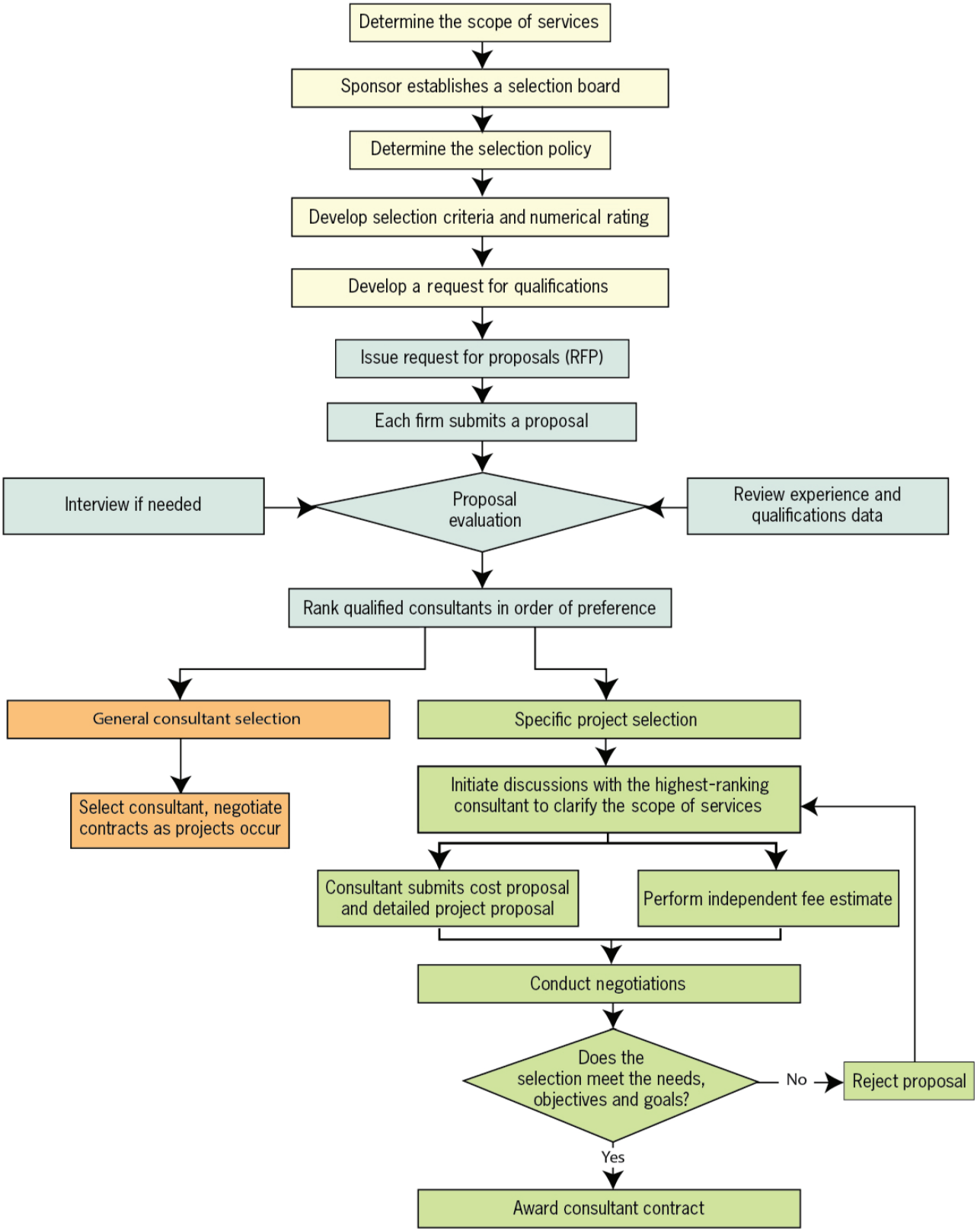
**Independent fee estimate (IFE)**: A process in which an airport sponsor requests cost estimates for professional services from sources other than the consultant selected for the work, to ensure the proposed fee for the work is reasonable.

**Qualifications-based selection**: A fair and open selection process based on the qualifications and experience of the firms. It is required for architectural, engineering and planning services for Airport Improvement Program grant-funded projects and may be required for non–Airport Improvement Program projects based on state procurement laws.

### Qualifications-Based Selection Process

In a qualifications-based selection, the airport sponsor selects a consultant based on qualifications and experience, without consideration of cost. The airport sponsor issues a request for qualifications identifying the project or projects for which the selection is occurring and the criteria that will be used to evaluate the submittals. After the consultant is selected, the fee for the project is negotiated, or in the case of multiple-year and multiple-project selections, the fee is negotiated on a project-by-project basis. *ACRP WebResource 6* includes a sample request for proposals. Figure 8 is a flow chart for a typical qualifications-based selection process at a small airport. For larger projects, a prequalification of consultants can also occur, as shown on Figure 2-2: Consultant Selection Process for a Single Project in FAA Advisory Circular 150/5100-14. *ACRP Legal Research Digest 16: Procurement of Airport Development and Planning Contracts* provides guidance on how to determine the procurement process requirements. *ACRP Report 87: Procuring and Managing Professional Services for Airports* offers information on the procurement process, negotiating for professional services and managing the professional-service providers.

The scope and fee for a project are related—a change in one usually initiates a change in the other. The FAA provides sample project scopes in Appendix C of FAA Advisory Circular 150/5100-14.




Source: Adapted from FAA Advisory Circular 150/5100-14E: Architectural, Engineering and Planning Consultant Services for Airport Grant Projects, Figures 2-1 and 2-2, September 30, 2014.

***Figure 8. Qualifications-based selection process.***

When negotiating a project scope and fee, the airport sponsor needs to keep a record of the negotiation. A sample record is provided in Appendix F of FAA Advisory Circular 150/5100-14. The FAA also has a consultant selection certification form. The Wyoming Department of Transportation has an Airport Consultant Selection Process Document that summarizes the process and includes example forms for documenting the process.

## Neutralization of Competitive Advantages

When conducting a qualifications-based selection, the airport sponsor must take steps to neutralize any competitive advantages, as described in FAA Advisory Circular 150/5100-14. FAA Advisory Circular 150/1500-14 provides the guidance for airport sponsors in the selection and hiring of architectural, engineering and planning consultants. In the 2015 update of this advisory circular, new guidance on fair and open competition was provided. Some of the requirements to ensure a fair and open competition include that any consultants that have developed or drafted specifications or statements of work for a procurement process must be excluded from competing for such procurements. Also, if some consultants competing for a project have access to documents such as a master plan or CIP, full and open disclosure to all proposers of the information should be made to neutralize the advantage.

The FAA identifies that objectivity of the planning consultant's performance may be compromised if the firm is in a position to establish development goals for which the same firm will be tasked with the engineering design services. Sponsors can mitigate these apparent concerns by separating the procurement of a planning consultant from that of an engineering design consultant. A firm that performs planning services may compete for follow-on engineering, provided the sponsor properly mitigates any situation of unfair competitive advantage. A firm that prepared an environmental impact statement (EIS) may not compete for future work that the EIS addresses until the FAA has issued a record of decision (ROD).

## Informal Selection Process

Informal qualifications selection procedures may be used for consultant selection, when the services are estimated to be less than $100,000. Sponsors must consult with FAA Airports personnel before using the informal process to ensure the use is appropriate. Under the informal procedure, a sponsor must contact at least three firms and discuss their qualifications to perform the work. Negotiations must be conducted with the best-qualified firm to arrive at a fee. The sponsor must document the process used and the reasonableness of the fee.

## Multiple-Services Contract

Many small airports select a general consultant for projects anticipated in the next 5 years. Such a selection reduces the workload of managing the selection processes for each project. Also at smaller airports with fewer projects, it is more attractive for consultants to submit qualifications, because they are being selected for a larger pool of projects. It is acceptable for a sponsor to procure a consultant for several projects through one procurement, provided that the following conditions are met:

- The consultant is selected using a qualifications-based selection process.
- The parties are informed that the work may be accomplished over multiple grants, and the statement of work and required services are defined.
- The parties are advised that some of the services may not be required and that the sponsor reserves the right to initiate additional procurement actions for any services included.

- The services are limited to those specific projects that the sponsor expects to initiate within 5 years. Projects initiated within 5 years may continue beyond the duration of the initial contract, but no new projects should be initiated without a new procurement.

## Independent Fee Estimate

For AIP-funded projects, the airport sponsor is required to obtain an independent fee estimate (IFE), even if using an informal selection process. The IFE requirements are detailed in Section 2.12 of FAA Advisory Circular 150/5100-14. For contracts with an anticipated value less than $100,000, the airport sponsor can meet the IFE requirement by comparing the proposed contract to previous contracts of a similar project or by preparation of an IFE. For contracts with an anticipated value greater than $100,000, a detailed fee or cost analysis is required. This can be accomplished by having another consultant prepare an estimate for the service.

The cost of obtaining an IFE is an AIP-eligible cost. The sponsor may engage a consultant on retainer to prepare the IFE, provided the consultant has experience with the services involved and is not being considered for the project. A consultant can also be hired to prepare the IFE, provided that the consultant has experience with recent similar work and was not on the pre-selection short list. State aviation personnel who have experience with the services involved may also prepare the IFE for the sponsor's use. An IFE can be prepared by the sponsor, if the sponsor has staff with experience in estimating the professional services and negotiating contracts.

The sponsor may hire a consultant to prepare an IFE using informal or noncompetitive qualifications-based procedures; however, the IFE consultant will not be eligible to perform work on the project and should not have been part of the project selection short list. When requesting preparation of the IFE, the firm preparing the estimate is typically provided with the scope of work, to ensure that the fee estimates are based on the same level of effort. The firm preparing the fee estimate will be informed that the request is for an IFE and not the actual work.

## Contracting Methods and Allowable Costs

While a sponsor may use a standardized contract, it is often necessary to modify the specific terms for the project and to include the mandatory contract provisions. All federally funded contracts must include the required contract provisions, as detailed on the FAA Procurement and Contracting Under AIP web page.

The contracts typically address four types of allowable costs per FAA Advisory Circular 150/5100-14:

- **Direct**: The actual cost of the labor, i.e., the staff time at the hourly pay rate.
- **Overhead**: Added to the direct costs is the allowable overhead rate. For consultants that perform work for state or federal agencies, there is an audit process through which the allowable overhead rate is approved. The overhead rate includes payroll burden—such as the employer share of taxes, workers' compensation insurance and employee benefits such as insurance, paid time off, and retirement benefits—and general overhead such as indirect salaries for support staff (accounting, legal, administrative), facility ownership or rental, office supplies and equipment, professional development and taxes.
- **Profit**: The consulting firms that provide services to airports are for-profit companies. An allowable profit rate is included as part of the contract and may not be applied to expenses or pass-through costs. Typical profit rates are 10 to 15 percent.
- **Direct nonsalary expenses**: Expenses are the nonhourly costs on a project, such as travel, printing and shipping. Expenses are typically identified separately when negotiating the

contract. Some contracts include a separate cap on expenses and some, especially on lump-sum projects, include project expenses within the overall contract amount. Subconsultant and outside-services costs may include administrative costs related to managing the service.

Per FAA Advisory Circular 150/5100-14, there are four types of allowable contracts for AIP projects:

- **Direct personal services**: Based on a per diem charge with a ceiling price. Best suited for legal work or intermittent personnel service.
- **Retainer**: Assures the sponsor of having the desired services available for future work. The terms of a retainer vary widely, from a fixed sum to a mutually agreeable basis with per diem or hourly rates.
- **Cost plus fixed fee (not to exceed)**: Frequently used when a consultant is required to start work before the cost and scope of the project can be accurately determined. This contract provides reimbursement for allowable salary, overhead and expenses, plus a fixed fee. The fee is fixed and does not vary with the costs. There should be an upper limit on the allowable costs, which should include an allowance for contingencies. Costs are not to exceed the upper limit without prior approval from the sponsor and, if federal, participation from the FAA. Expenses and pass-through costs may not be included when applying the profit to the price.
- **Fixed lump-sum payment**: Typically used when the scope of work can be clearly and fully defined at the time of the agreements. The lump-sum payment is based on the allowable costs for salary, overhead and expenses, plus a reasonable margin of profit. The lump-sum proposal should include a detailed estimate of the labor costs, categories of employees, work hours, hourly rate, overhead, expenses and profit.

Design projects may be negotiated to be performed in phases and may use different compensation methods in different phases.

A cost-plus-a-percentage-of-cost contract is prohibited for federally funded projects. This method is defined as a payment formula based on a predetermined percentage rate of actual performance costs, by which the sum of the consultant's entitlement, uncertain at the time of agreement, increases commensurately with increased performance costs.

Specific rates of compensation (not to exceed) are allowable but should only be used when it is not possible at the time of procurement to estimate the extent or duration of the work or properly estimate costs with any reasonable degree of accuracy. Sponsors need advance approval from the FAA to use this method. Specific rates of compensation are allowable, in that with this contracting method, the indirect costs and fees must be recovered as a part of the established, fixed hourly billing rates for labor hours worked.

## 3.12 Administrative Tasks

### Key Insights

*If an airport has staff other than the airport manager, the airport manager must understand and be able to address a full range of human resources issues.*

*When there are human resources issues, before any discussions are held with the employee, the airport manager should first consult with the internal or airport sponsor human resources professionals for policy and direction.*

*Staff dedicated to airport rescue and firefighting, police/security and maintenance may calculate hours worked differently from other staff, as dictated by their respective collective bargaining agreements.*

### Key Definitions

**Enterprise operating system**: Refers to a standard, enterprise-wide collection of business processes used in diversified companies or public agencies. An enterprise system definition can also include in a common structure: financial/reporting, maintenance/asset management, information technology backbone/communications, properties management, procurement and operational modules necessary to drive the wider organization.

**Human resources (HR)**: The department of a business or organization that deals with the hiring, administration and training of personnel.

**Occupational Safety and Health Administration (OSHA)**: An agency within the United States Department of Labor, responsible for assurance of "safe and healthful working conditions" through setting and enforcing labor standards and educational and training outreach on workplace safety.

**Stand-alone financial system**: An off-the-shelf financial module that can be used for accounting and bill processing to support airport operations but that would not be tied to a larger, all-inclusive enterprise operating system.

### Employee Recruitment and Retention

If there are other staff at your airport and they report to you, HR functions may become part of your responsibilities. To the extent available, you should work with the HR professionals in the sponsoring governing agency for assistance and guidance. In addition to more routine management tasks, such as assigning work and evaluating performance, you may need to address: hiring, multiple generations in the workforce, succession planning, managing conflicts and terminating employees.

#### *Hiring*

Hiring practices are largely dictated by the established policies of the sponsoring governing agency. For professional employees, it is best to cast a wide net regionally or nationally through the various professional association newsletters to find the right candidates. In some cases, the search can be conducted by a recruiting company (head hunter); however, fees for such can add up to 25 percent of the employee's first year of salary and should be balanced against the benefits provided by the recruiting company. Blue collar and high-skill employees are usually best chosen from a local or regional pool of candidates who would have the appropriate licensure and experience with local regulations.

The goal usually is to hire new staff who show the potential to stay and grow with the airport over time. With succession in mind, it is important to recruit and manage by the old adage "hire slowly, fire quickly." In other words, take a long time in due diligence to make sure that your intended hire is exactly who and what you need for the long term. And, as soon as it is very clear that a certain individual will not work out for your organization, make the decision to terminate quickly, rather than hoping that something will change.

### *Alternatives to Hiring Permanent Employees*

Many airports use either an intern or volunteer program, or a combination of both, to offset the need to hire full- or part-time employees; they do so primarily because of budget constraints. These programs are especially effective to enable completion of tasks that are temporary or augmentation of the airport's staff during times of special need, such as special events, airline operations or seasonal requirements. The program that will be the most effective will depend on each organization's specialized needs. *ACRP Synthesis 18: Aviation Workforce Development Practices* includes a discussion on intern and university partnership programs.

**Intern Programs.** An alternative to hiring full-time employees may be the institution of an intern program. An internship is a paid or unpaid position that is part of an official program offered by an employer to potential employees. Interns work either part time or full time at a company for a certain period of time. Internships are most popular with undergraduates or graduate students who have a goal of gaining practical work or research-related experience. Interns are typically enrolled in a college major that will provide added value to the organization without it having to invest in an extensive training period. The term of employment for interns usually ranges from 1 month up to 1 year and will depend on the amount of college credit to be earned and the complexity of the tasks to be completed. Internships can also provide the employer with an opportunity to find qualified and talented individuals for continued full-time employment.

Internships can provide a cost-effective method of increasing productivity, completing one-time or short-term projects, or fulfilling a short-term staffing need that may arise because of prolonged absences, such as medical or military service. Paid intern programs are generally more successful than unpaid ones because they can attract candidates from a larger geographical area, thus producing a wider variety of skill sets from the applicants, because the salary will help offset costs the intern may encounter, including travel, housing and meals. Even with a paid program, the salary is generally much lower than that of a full-time employee and does not require benefits to be paid. Pay for the intern can be calculated on an hourly, weekly or lump-sum basis. It may also be supplemented or reduced by the employer, providing benefits such as housing, transportation or attendance at a related conference during the internship. Programs that do not provide payment to the intern may only be successful if the participating academic institute gives college credits for successful service as an intern. Even then, some form of payment may be necessary. In some instances, national or state associations and colleges offer scholarships for qualified students that can further reduce the employer's financial contribution.

When contemplating an intern program, you should be sure that there is a meaningful task or set of tasks with a defined, desired outcome that must be completed. Many of the programs center on the airport operations area but can include specific areas, such as the preparation of planning, security or operations documents. Coordination with the academic institutes should be undertaken early in the process to ensure that the program being offered will qualify for college credits. Because of their educational background with specialized knowledge areas, interns will devote the time required to accomplish their assignments with minimal supervision, allowing time for the airport's employees to concentrate on their assigned duties.

**Volunteers in the Workplace.** The most obvious advantage of a volunteer program is free help—or the minimal cost of running the program and the provision of some training and small tokens of appreciation to the volunteers. Using unpaid workers is a cost-effective way to complete tasks for which you may not have the time or resources. Volunteers allow your staff to dedicate time to ongoing projects and new initiatives. The use of a volunteer program can require some staff time to provide an adequate amount of training, resources and oversight for these workers, depending on the tasks they are assigned to perform.

Volunteers can be utilized to help with tasks as simple as greeting the public and providing information about topics, such as tenant contact information, hours of operation and meeting dates and agendas. Assignments could include more technical work, such as recording fuel sales or operational data and logging income receipts. Often, the volunteers can prepare a guide for the duties they perform, thus assisting future volunteers in quickly adapting to the position. Some airports are operated by a volunteer board or have volunteers serving in an advisory capacity to the governing authority. Additionally, pilot's associations will often provide volunteer labor to complete specialized tasks, such as cleanup projects or assistance with special events.

In many cases, volunteers can be motivated to help an organization's cause and are happy to devote their time to the organization. Volunteers may exhibit a true passion, contribute fresh ideas and show a willingness to go above and beyond. Volunteers are likely to exhibit genuine excitement about getting involved and taking on new projects. However, if you fail to provide meaningful tasks or do not explain how the volunteer's contributions help the organization, you may negatively affect the volunteer's motivation and morale. Care should also be used to match volunteers' tasks to their abilities.

Although volunteers can provide a ready workforce, there are some key negative aspects to consider when using airport volunteers:

- Accountability. Because the volunteer is not paid, there is no incentive to complete the assigned tasks at a high level—except for the person's ethics and desire—i.e., volunteers can be undependable, for example, not showing up on time or not completing assignments.
- The amount of training volunteers will be required to have so that they can be helpful. Also, liability may be an issue if they are not properly trained.
- The amount of exposure an airport volunteer may have to the operational area of the airfield.
- Passion. Although they may volunteer to be close to aviation, they may not have passion for the work.

If the airport's employees are covered by a labor agreement, care must be taken to ensure the volunteers do not work on something that was part of a bargaining unit's agreement. Volunteers should be used to augment and not replace airport staff.

The success of any intern or volunteer program will depend on a well-thought-out plan including a clear, precisely defined and well-communicated set of tasks and desired outcomes. Equally important will be a thorough and complete screening and interview process for the candidates.

### *Employee Evaluation*

The current best practice for evaluating employee performance is to meet with the employee at several points throughout the year, rather than once at the end of the year. This practice comes from the consideration that several meetings will aid the employee's performance by keeping the employee aligned with established goals throughout the year. In this way, minor course corrections can be made throughout the year, rather than a look back at the end of the year, when it is too late to affect any needed change. This practice is more beneficial for the employee and employer in helping to ensure favorable outcomes regarding performance to goals in any given year.

Regardless of the number and cycles of meetings with the employee, performance to a set of established goals is essential. The goals should be established at the top level in the organization and delegated to staff in a quantitative way that will allow employees to take responsibility for their contributions to the airport's success. These goals should also be tied to quantitative outcomes, which are usually a function of the KPIs that the airport management previously established. Aligning each employee to the established airport strategy, goals and KPIs is a process that will greatly improve airport performance and help to ensure fully committed and positively engaged employees.

### *Generations in the Workplace*

The topic of generations in the workplace warrants attention by airport managers. Today's workplace is staffed by people from generations that may have different values and workplace outlooks and require different motivational and organizational approaches.

The traditional generation (also known as the silent generation) of employees born in the late 1920s through mid-1940s has mostly exited the workplace over the past 10 to 15 years but still maintains a workplace presence. This generation embraces institutional values and organizational structure and possesses high levels of skill and experience, coupled with the ability not to get bogged down by minutiae.

Baby boomers, born in the late 1940s through mid-1960s, are characterized by a strong work ethic, discipline, competitiveness and self-reliance. In 2015, when the traditional generation made up slightly more than 2 percent of the U.S. labor force (according to the Pew Research Center), baby boomers commanded nearly 29 percent of the workforce. As a generation that thrives in a structured environment, this generation brings not only the value of their experience and work ethic, but also workplace efficiency and leadership for newer generations. However, this generation is rapidly exiting or modifying its role within the workplace.

Generation X employees born between 1965 and approximately 1984 compose a substantial share of the current working population: 34 percent. The representatives of this generation combine elements of the baby boomer generation (such as self-reliance and a preference for structure and direction) with a more balanced approach to work and a fair amount of skepticism toward the ways that the traditionalists and baby boomers have done business. While their focus on results instead of the process may be frustrating to management, the same approach brings substantial efficiency, entrepreneurship and innovation to the workplace dynamic. They best serve in connecting the ethics and ideas of the previous workplace generations with the dynamics of the Generation Y (millennials) and emerging Generation Z.

Millennials, born mid-1980s to early 2000s, are the largest and still-growing segment of the working population, comprising approximately 35 percent of the current workforce. While the characteristics and dynamics of this generation often have been disparaged, airport managers should remain wise to the benefits that this generation brings to the workforce, as well as the best way to motivate the representatives of this generation and help them flourish within the organization. Millennials not only bring the ubiquitous connectivity to sources of information and others but also are highly resourceful and capable of independent learning and development, when given the correct incentives. Those incentives include frequent and constructive feedback from management, meaningful and fulfilling work assignments, team-oriented work environments and schedule flexibility. Millennials place the work-life balance, and making a difference in the workplace and the world, above all other goals. Striking a balance in the way that the millennials integrate into the workplace stands to bring managers substantial benefits in productivity, workforce motivation and the flow of ideas and solutions.

Generation Z, born in the late 1990s and later, has the newest representatives in the workforce. They double-down on the professional and social connectivity of their older millennial peers and add the qualities of compassion, understanding and collaboration, forged in their formative years spent during the Great Recession. It is yet to be seen how this generation will affect the future workforce of small airports.

Regardless of the generational role, the representatives of the last three generations must be keenly understood by their management, not only as employees with differing motivators and strengths or weaknesses but also as the future of airport industry leadership.

### *Succession Planning*

Succession planning is fundamentally important to an effective transition to new leadership, preserving organizational continuity and promoting the retention of institutional knowledge. Airport managers should aim to recruit new employees with the goal of eventually transitioning to more advanced roles. In the process of employment and career growth, airport leadership should evaluate the knowledge, skills, abilities and leadership potential of existing staff to fill key roles as they become available through voluntary attrition or because of airport growth and organizational expansion.

Succession planning has a benefit beyond continuity and knowledge retention. The ability to fill key roles from within the organization improves organizational morale and employee retention and reduces the costs of new employee recruitment. Moreover, succession planning and cross-training of new leadership promote organizational soft resiliency, giving airports the ability to retain flexibility and functionality in the event that management is not available to perform its duties.

At small airports where the staffing is too limited for succession planning, it may be necessary for current airport staff to document their responsibilities. This can take the form of SOPs. The documentation of responsibilities then provides a conduit for knowledge transfer.

### *Conflict Management*

Airports, like any other workplace, are subject to differences in personalities and opinions. While it is natural for humans to avoid interpersonal conflict, allowing conflicts to fester unresolved beneath the surface may have grave consequences and even result in legal repercussions for the airport or airport sponsor. Workplace conflicts that become emotionally charged or personal create an unhealthy work environment, which results in reduced productivity and a potential loss of valuable employees due to workforce attrition. Hence, it is important for airport managers to be aware of the workplace dynamics and address any disagreements in a timely, professional and productive manner.

Any workplace differences should be resolved in a timely manner, in accordance with the HR policies and procedures set by the airport sponsor. At any point in the progress of the conflict, when the disagreements escalate to a personal level or may result in staff dismissal or voluntary resignation, airport management should involve the airport sponsor's HR professionals to assist in conflict mitigation. In the event that workplace conflict may result in potential legal issues or becomes abusive, outside assistance, in the form of a mediator or an attorney specializing in conflict resolution, should be used.

Finally, workplace conflicts can be altogether minimized by fostering an environment that values differences in opinion, where employees feel empowered and safe to share those differences with management and other colleagues, and by recognizing how different workforce generations interact with each other.

### *Termination*

Employee terminations are a fact of life for any business. Terminations can be tied to performance, policy or rules infractions, criminal activity, ethics violations or shifts in organizational priorities. In each state or locality, there are very objective rules and laws that must be used to guide the process of progressive discipline and termination. Because of this, it is of paramount importance for the airport manager to reach out to the respective local HR partners very early in any situation that arises in the normal course of business. In the case of a possible sexual harassment or hostile work environment claim, to avoid further challenges, the airport manager should consult with HR or legal services prior to any communications verbally or written, including email.

Terminations for cause should follow the established, progressive discipline guidelines for the locality. In cases of probationary period terminations, or terminations due to shifts in organizational priorities, it is in the best interest of the employer and employee to quickly make and execute these decisions, so that each party can move on in a positive manner.

## Occupational Safety and Health Act Regulations

The Occupational Safety and Health (OSH) Act covers most private-sector employers and their workers, in addition to some state and local government employers and their workers in the 50 states and certain territories and jurisdictions under federal authority. Jobs in the airport environment have the potential to be exposed to more hazards than other occupations. While the safety culture of aviation has a positive impact on the promotion of less hazardous work environments and conditions, airport sponsors may still be subject to OSH Act requirements. The OSH Act encourages states to develop and operate their own job safety and health programs and precludes state enforcement of OSHA standards unless the state has an OSHA-approved state plan; the states with OSHA-approved state plans are listed on the OSHA State Plans web page. An airport sponsor should be aware of OSHA requirements, especially if there are specific training requirements based on work responsibilities. The airport's sponsoring agency may be a resource to help identify OSHA-related requirements.

The other area in which an airport may experience OSHA regulations is during on-airport construction or other project work in which private companies are involved. Nearly all private employers are subject to OSHA regulations, with the exception of industries regulated by other agencies and their respective regulations. On-airport construction projects are subject to not only the regulations but also OSHA inspections, and any workplace injury or incident on the project site may be the subject of an OSHA investigation. While the assurance of workplace safety and OSHA compliance is the responsibility of the company performing the task (whether as a prime contractor or subcontractor), the fallout of a workplace injury or death resulting from an OSHA violation will affect the airport and airport sponsor. An investigation by OSHA will halt the project for its duration, and any findings of fault by the contractor or its subcontractor may prevent them from continuing work on the project. As a result, the airport sponsor may need to re-bid the project and select a new contractor to perform the task. This will delay the project and bring possible grant implications and cost overruns. Moreover, such an event may have public relations consequences that tarnish the airport's public image and the community's goodwill toward the facility. Even when the airport is not in an OSHA-obligated state, awareness of the OSH Act's requirements and airport management's focus on regulatory compliance are in the airport's best interests. Additional information on OSHA regulations and how to obtain further information is located on the OSHA website.

## Administrative Operating and Reporting Systems

Proper accounting and financial controls are essential to managing an airport as a functioning business entity. It is a best practice to establish and manage from KPIs for airport operations and finance. Without a proper financial database, KPIs cannot be validly established or tracked.

Most medium- and large-hub airports operate from enterprise operating system platforms internally or as a part of their municipalities. This type of system allows these airports to have standard modules that can handle their financial, administrative, procurement and technical needs, all in one common platform. Most municipalities of reasonable size also operate from common enterprise platforms. However, many small airports are not connected to their municipal enterprise systems, because it is not technically feasible or one does not exist. In these cases, the airport usually employs an off-the-shelf, stand-alone financial management system to keep its books and handle billing. Many of these off-the-shelf systems are very limited in what they can do and what they can provide to airport management.

### *Administrative Best Practices*

It is very important for airports of all sizes to operate from a set of well-thought-out and developed key performance indicators. These KPIs can help guide management to make decisions that will ultimately improve the airport's financial and operational sustainability. In order to have viable financial and operational performance goals, it is essential that the airport is operated on an administrative system that is capable of quantifying the real costs associated with running the business. In short, running an airport business requires a certain amount of data mining. This data must be reliable and verifiable.

Most patchwork, off-the-shelf operating systems are usually not capable of supporting the data needs for an airport because of their typical inability to interface with a larger, local enterprise system. These stand-alone, off-the-shelf systems are usually purchased to handle a single administrative function very well, but their potential to add modules that are worthwhile and robust are typically limited.

The best practice for a single airport operated independently of a local municipality would be to purchase a stand-alone airport operating system that has the potential for additional management modules to be added as needed. This operating system should be capable of supporting the entire airport enterprise with a full range of capabilities to include finance/accounting, procurement, maintenance/asset management, operational/regulatory, property management, dashboards and reporting, etc.

The best practice for a single airport operated as a dependent entity of a local municipality would be to tie into the overall enterprise operating system of the host municipality. In this way, the airport and municipality can work to fine-tune their joint administrative processes, while mining valid data relevant to the airport operating as a stand-alone business entity. This also serves to solidify the goal of following similar processes, financial reporting and regulatory guidelines, as defined by the municipal management. If there is no enterprise operating system in place for the municipality, a stand-alone operating system should be considered, with a long-term goal of migrating to a future enterprise system serving the entire municipality.

In either case, it is essential that the airport have the best possible information regarding its true costs and revenues, including any system subsidies and cross-charges that may exist in its locality. The best case for most airports is to operate to the greatest extent as a true stand-alone business entity from a profit-and-loss standpoint. This will allow the airport to establish independent goals and performance measures that would enable it, over time, to operate to whatever extent possible in a long-term, financially sustainable manner.

CHAPTER 4

# Operations—Running a Safe, Secure and Efficient Airport

Icons are defined in Figure 1 of Section 1.1.

Operations is a daily, ongoing element of small airport management to provide a safe and efficient airport for the users. This chapter is organized to address the most frequently used or needed aspects of operations first, followed by more specialized operational activities. It is intended that a less experienced small airport manager could start at the beginning of this section and progressively build an understanding of the operational elements of small airport management. Some of the specialized items will not be applicable to all small airports, such as winter operations or joint use, but are included for those small airports to which they are applicable and to provide background information for other small airport managers.

## 4.1 Inspection

### Key Insights

*Inspection requirements should be established for the airport facilities/equipment, maintenance vehicles and navigational aids owned by the airport to ensure that the facility is maintained to the highest possible standards and to reduce downtime and safety risks and their associated insurance costs.*

*Airport operator self-inspections are used to promote compliance with the operating or licensing requirements and are conducted daily. These daily inspections are conducted separately from inspections carried out by the certifying or licensing authorities that are generally performed on an annual basis.*

### Key Definitions

**Aircraft rescue and firefighting (ARFF)**: A special category of firefighting that involves the response, hazard mitigation, evacuation and rescue of passengers and crew of an aircraft involved in an airport ground emergency.

**Automated Weather Observing System (AWOS)/Automated Surface Observing System (ASOS)**: A system of weather sensors that collect and disseminate weather data to pilots and flight dispatchers so they may prepare for and monitor weather forecasts. The ASOS program is entirely federally funded, whereas AWOSs are generally funded by the operator or airport sponsor.

**FAR Part 77: Objects Affecting Navigable Airspace**. Part 77 establishes standards for determining obstructions in navigable airspace, outlines the requirements for notifying the FAA of

certain proposed construction or alteration and provides for aeronautical studies of obstructions to air navigation in order to determine their effect on the safe and efficient use of airspace. FAR §77.25 of this part establishes imaginary surfaces around airport runways, approach zones and navigable airspace in the vicinity of the airport.

**Frangible coupling**: Mounting coupling for lights, signs and navigational aids designed to shear at a defined force, reducing the possibility of loss of aircraft control, damage and injury.

**Navigational aid (NAVAID)**: Any form of aid to navigation designed to assist the pilot with position and height information and wind conditions. Examples: instrument landing systems, visual approach slope indicators, precision approach path indicators, wind cones and very high frequency omnidirectional ranges.

**Notice to Airmen (NOTAM)**: A notice containing information concerning the establishment of, condition of, change to any component (facility, service or procedure) of or hazard in the National Airspace System, the timely knowledge of which is essential to personnel concerned with flight operations.

**Object-free area (OFA)**: The area of the airport centered on the runway, taxiway or taxilane centerline provided to enhance the safety of aircraft operations by having the area free of objects, except for those that are necessary for air navigation or aircraft ground maneuvering, which are required to be mounted on frangible couplings.

**Precision approach path indicator (PAPI)**: A visual aid that provides guidance information to help a pilot acquire and maintain the correct approach, relative to aircraft altitude, to a runway.

## Self-Inspections

The goal of an airport self-inspection program is to identify potential safety or security issues and address them as soon as practical to keep the airport in good operating condition. While reactive maintenance may occur from inspections, a best management practice is to develop a preventive maintenance program to minimize the need for reactive maintenance. FAA Advisory Circular 150/5200-18: Airport Safety Self-Inspection provides details and a sample inspection checklist to help airports establish or review their self-inspection programs. Four types of inspections are generally used by airports as part of a self-inspection program:

- Routine or scheduled
- Continuous surveillance
- Periodic condition
- Special inspections

If the airport is used daily, provisions should be made to inspect it on a scheduled basis, at least once daily. For airports operated at night, inspections should occur in daylight and periods of darkness. Daily inspections are considered routine. If an airport is operated less than daily, inspections should occur at least as frequently as the airport is in operation.

Activities such as construction or wildlife migration may require continuous surveillance to prevent hazards to aircraft. Periodic inspections are less frequent and may include specific assessments of pavements and pavement markings and recordings on airfield lighting circuit performance. Special inspections include checking the airfield after an unusual operation or condition, such as an aircraft accident or meteorological event. Conducting a special inspection prior to reopening a closed portion of an airport will ensure the pavements and safety areas are clear and airfield lighting systems are functioning correctly.

Numerous areas of an airport should be included in the self-inspection program. A regular inspection program can be established as an airport policy. A template airport inspection policy and checklist is provided in *ACRP WebResource 6*. This template should be modified to fit the facilities and operations at your airport. This template includes fuel system elements for airport operators that are also responsible for the fueling services. Fuel system inspections are also discussed in more detail in Section 4.4: Fueling Operations.

*ACRP Synthesis 27: Airport Self-Inspection Practices* summarizes current practices at airports. The corrective action program is equally essential to ensure that any discrepancies are corrected in a timely manner and the resolution is documented as complete. Also, as needed, the operator should issue a NOTAM to report deficient conditions that could have an immediate and critical impact on the safety of aircraft operations. This NOTAM must be cancelled by the airport operator when the deficient conditions are addressed.


Small airports with an FAR Part 139 certificate have specific daily, or more frequent, inspection requirements. Part 139 requires records of each inspection, indicating conditions found and corrective actions taken, to be maintained for at least 12 consecutive months. The inspection and record-keeping requirements are detailed in FAR §139.327, and the specific inspection plan should also be addressed in the airport certification manual (ACM).

To enhance safety and security, a routine inspection program is an essential tool for all small airports. State-issued operating certificates may also include a daily inspection requirement. The Part 139 record-keeping requirement of 12 calendar months provides a good guide for other small airports that are state certificated. Routine inspection programs and prompt resolution of discrepancies help airports demonstrate their care of the airfield in the event of an accident, as discussed in *ACRP Legal Research Digest 33: Overview of Airport Duties and Standards of Care in Airfield Accident Cases*.

## Common Inspection Items

This section addresses the most common areas that must be inspected at a small airport. Along with the tools in *ACRP WebResource 6*, this discussion of inspection items can help identify the inspection requirements most applicable to your airport.

### *Pavement Areas*

The condition of pavement surfaces is an important part of airport safety. When possible, pavement inspections should be conducted daily before flight operations commence to ensure pavement surfaces are clear. *ACRP Synthesis 26: Current Airport Inspection Practices Regarding FOD (Foreign Object Debris/Damage)* identifies FOD management programs used at airports to keep pavements clear. At a minimum, a daily inspection should be performed on all paved areas that are the responsibility of the airport operator or as specified in the FAA-approved ACM for Part 139 airports. During the pavement inspection, the inspector should also observe the items associated with and around the pavement areas, such as lights, signs and markings.

### *Runway and Taxiway Safety Areas and Object-Free Areas*

Safety areas are intended to support an aircraft if it leaves the pavement. OFAs are to be free of objects except those fixed by an aviation function, such as lights, signs or other navigational aids required based on siting criteria.

Safety areas should be inspected for proper grading and drainage. OFAs need to be checked that they remain free of obstructions. The inspector should know the dimensions of the runway and taxiway safety areas and OFAs at the airport. At airports certificated under Part 139, the

**INSPECTION ITEMS**

**AIRFIELD**
Pavement, safety and object-free areas
Markings
Signs
Lighting systems
Part 77 obstructions
Security systems
Wildlife hazards
Snow and ice (as applicable)
Construction areas (as required)

**NAVAIDS**
PAPIs/VASIs, REILs
Approach lighting system
Wind socks and associated lighting
AWOS

**VEHICLES**
Airport/maintenance vehicles
Mowing equipment
Snow removal equipment (as needed)
ARFF vehicles (as required)

**FUEL STORAGE SYSTEMS**
Tank and filter sumps
Hoses and fittings
Nozzles and couplings
Bonding/grounding cables
Leaks (visual check)
Fire extinguishers
Transaction equipment, if equipped

**FUEL DELIVERY VEHICLES**
General vehicle condition
Filter sumps
Tank sumps
Filter pressure differential
Deadman controls
Brake interlocks
Nozzles and cover
Hose condition
Ground reels, cables and clamps
Fire extinguishers
Tanker bottom loading
Air tanks (if air-brake equipped)
Spill kit
Leaks (visual check)

dimensions of the safety areas should be documented in the ACM. For airports that are not Part 139 certificated, the safety area and object-free zone requirements may be found in FAA Advisory Circular 150/5300-13: Airport Design or on the airport's approved ALP. Safety area widths are listed in the advisory circular and are based on the aircraft group (wingspan) and category (approach speed). The aircraft category and group information for a particular airport should be available in the airport master plan and on the ALP. It is based on the critical aircraft, the largest aircraft or group of aircraft, that use the airport on a regular basis. FAA Advisory Circular 150/5000-17: Critical Aircraft and Regular Use Determination defines "critical aircraft" and identifies the information and analysis needed to identify the critical aircraft. There was a national initiative to improve runway safety areas at NPIAS airports. The FAA used FAA Standard Operating Procedure 8: Runway Safety Area Determination to assess the safety areas.

### *Markings*

Airport markings provide important information to pilots during takeoff, landing and taxiing. To avoid confusion and disorientation, airport markings should be in compliance with FAA marking standards specified in FAA Advisory Circular 150/5340-1: Standards for Airport Markings. Compliance with these standards is mandatory for operators of airports certificated under Part 139 and for airport operators that have accepted federal funds for runway and taxiway construction or rehabilitation. The inspector should know the appropriate markings required at the airport.

### *Signs*

Signs provide important information to pilots while taxiing. To avoid pilot confusion and disorientation, airport signs should be in accordance with FAA sign standards specified in FAA Advisory Circular 150/5340-18: Standards for Airport Sign Systems. Compliance with these standards is mandatory for operators of airports certificated under Part 139 and for airport operators that have accepted federal funds for runway and taxiway construction or rehabilitation. The inspector should know the appropriate sign standards and specifications at his or her airport and ensure that the signs comply with the FAA-approved sign plan, if applicable for that airport.

### *Lighting*

Lighting systems at night and during periods of low visibility are critically important for safe airport operations. Lights come in different shapes, sizes, colors and configurations and can be located in the pavement or along its edges, mounted on frangible couplings, as detailed in FAA Advisory Circular 150/5340-30: Design and Installation Details for Airport Visual Aids. A lighting inspection is best accomplished during periods of darkness in order to evaluate lighting systems when they provide the primary visual aid for pilots. The inspection should concentrate on the lighting owned by the airport operator. However, the inspector should observe any lighting owned or operated by the federal government and report any observed problems immediately to the appropriate responsible owner. At some airports, there are certain lighting systems owned and maintained by the FAA.

Airfield electrical systems are high voltage. Work on and around them requires using appropriate safety measures, including disabling and locking out the appropriate circuits in the vault.

### *Navigational Aids*

The inspection of NAVAIDs should concentrate on the visual navigational aids owned by the airport operator. These could include windsocks, PAPIs and AWOSs. However, the inspector should observe any NAVAIDs owned or operated by others, such as the FAA, and immediately report any observed problems to the NAVAID owner.

### *Obstructions*

The inspection of obstructions should concentrate on a visual check of construction underway on and near the airport that could affect aircraft operations. Cranes are a special area of concern. The inspection should also include checking for any fast-growing vegetation, especially trees that may penetrate the Part 77 surfaces. Additional information on obstructions is included in Section 4.10: Airport Obstruction Management.

When inspecting the airport, look at surrounding off-airport areas and keep an eye out for obstructions that have not been appropriately evaluated.

### *Wildlife*

Wildlife can create a significant aviation hazard and cause extensive property damage, injury or even loss of life. During the inspection, observations should be made to determine if wildlife hazards exist and if they need immediate or short- or long-term mitigation. Section 4.9: Wildlife Management contains more information on this subject.

### *Snow and Ice*

A snow and ice control plan is required at Part 139-certificated airports in climates where snow and ice occur. Where applicable, the inspector should be familiar with the airport's snow and ice removal procedures and the guidance provided in FAA Advisory Circular 150/5200-30: Airport Field Condition Assessments and Winter Operations Safety. During and after snow removal operations at any airport, an inspection should be conducted to determine the conditions on the airport, and appropriate NOTAMs should be issued for any nonstandard conditions. Additional information on snow and ice control is in Section 4.12: Winter Operations. A snow and ice control plan template that can be customized for your airport is located in *ACRP WebResource 6*.

### *Security Systems and Vehicles*

Areas to be considered for periodic inspections beyond the scope of the airfield inspections would include the proper operation of security systems; fencing; vehicles operated on the airport, including cars and trucks, mowing equipment, tractors and mowers; and other maintenance equipment owned by or used on the airport. Inspections of these vehicles and equipment will help to ensure they can be operated safely within the airport environment or for off-airport use as required. Items to be checked would include tires, brakes, wheels, fluid levels, belts and hoses and safety equipment such as light bars, headlights, taillights, turn signals, insignias and hazard flashers. Equipment maintenance is addressed in more detail in Section 4.7: Equipment Management.

### *Aircraft Rescue and Firefighting*

If the airport has ARFF equipment on the airport, inspection of the equipment, as prescribed by the manufacturer, should be conducted. Aside from the vehicle inspection noted previously, the inspection of all pumping and foam systems and the status of ARFF response—including the availability of equipment, firefighters and extinguishing agents—should be checked and noted. At Part 139 airports, ARFF capabilities must comply with the FAA-approved ACM and the airport's ARFF index must be appropriate for the size of air carrier aircraft serving the airport. Other areas to be inspected, as applicable, include ensuring the alarm and emergency notification communication systems are operable and determining the adequacy of the availability of fire extinguishing agents. Check for construction or maintenance activity on the movement area that could affect ARFF response routes and that the ARFF department has been notified if construction or maintenance activity could affect emergency response routes. The following must also be monitored: any ARFF vehicle, equipment or extinguishing agent that is inoperative or not available; any ARFF personnel who are not available; and any changes to aircraft that may require a change to ARFF capabilities. At Part 139 airports, the FAA must be notified if ARFF vehicles

are inoperative and cannot be replaced immediately, as specified under FAR §139.319(g), and a NOTAM must be issued regarding nonavailability of any rescue and firefighting capability, as specified under FAR §139.339.

### *Fueling Equipment*

Even if a small airport does not own or operate the fuel system, fuel storage areas and fueling vehicles should be inspected on a periodic basis and are covered in more detail in Section 4.4: Fueling Operations.

## 4.2 NOTAM Management

### Key Insights

*Airport operators or airport-owning agencies are responsible for observing and reporting the condition of airport facilities when temporary changes, irregular operations or outages could impact safe airport operations or the National Airspace System.*

*Airport operators are also responsible for initiating Notices to Airmen to report impacts to safety as observed via runway condition assessments and field condition reports.*

*The preferred means of filing Notices to Airmen is electronically through the federal NOTAM Manager system. They can also be filed by contacting a flight service station.*

### Key Definitions

**Chart supplement (formerly airport/facility directory)**: FAA publication containing data on public- and joint-use airports, seaplane bases and heliports.

**Federal NOTAM System (FNS)**: United States digital Notices to Airmen system.

**Field condition (FICON)**: Assessment of airfield conditions.

**Flight service station (FSS)**: A facility that provides information and service to aircraft pilots before, during and after flight but that is not responsible for giving instruction or clearance.

**International Civil Aviation Organization (ICAO)**: A United Nations specialized agency established to manage the administration and governance of the Convention on International Civil Aviation (Chicago Convention).

**National Airspace System (NAS)**: The airspace, navigation facilities and airports of the United States along with their associated information, services, rules, regulations, policies, procedures, personnel and equipment.

**Notice to Airmen (NOTAM)**: A notice containing information concerning the establishment of, condition of, or change to any component (facility, service or procedure) of or hazard in the National Airspace System, the timely knowledge of which is essential to personnel concerned with flight operations.

**Notice to Airmen (NOTAM) Manager**: The modernized NOTAM system that digitizes the collection, dissemination and storage of NOTAMs.

### Notices to Airmen

NOTAMs are essential to providing timely information about changing conditions or facilities within the NAS to personnel involved with flight operations. The airport operator is responsible for issuing NOTAMs for changing conditions at an airport. The need to issue or rescind a NOTAM may be identified through self-inspections. An airport operator may provide additional information to pilots through local airport advisories as described in *ACRP Synthesis 75: Airport Advisories at Nontowered Airports.*

NOTAMs provide essential information to airport users concerned with flight and airport operations by providing timely information about unanticipated or temporary changes to components of, or hazards in, the NAS and by providing information that becomes available too late to publicize in the associated aeronautical charts and related publications, such as the

chart supplement (formerly the airport facility/directory). NOTAMs are not intended to be used to impose restrictions on airport access for the purpose of controlling or managing noise or to advertise data already published or charted. NOTAMs of an extended period should be published instead of being allowed to remain in the NOTAM system. NOTAM guidance is provided in FAA Advisory Circular 150/5200-28: Notices to Airmen (NOTAMs) for Airport Operators.

The NOTAM system should be used to report the following conditions or categories of information:

- Surface areas: changes in hours of operations; hazards such as pavement issues, wildlife hazard conditions, surface conditions, airport construction, airport infrastructure deficiencies and airspace obstructions
- Runway condition reports
- NAVAID outages
- Commissioning, decommissioning, opening, closing or abandonment of a public airport
- A decrease in ARFF capability; restrictions to air carrier operations that may result
- Changes to runway and taxiway identifiers, dimensions, declared distances, threshold placements, surface compositions and closures
- Deficiencies in required NAS lighting systems, such as airport beacons, runway and taxiway lights and wind cones, including the commissioning, decommissioning, outages or changes in classification or operation

The NOTAM should contain the following elements and maintain the following order:

- Exclamation point
- Accountability for established NOTAM (e.g., airport identification, flight data center)
- Location of the condition (affected facility)
- Keyword for affected surface or service [e.g., RWY (runway)]
- Attribute, activity or designation of the surface
- Surface segment, if applicable
- Lower and upper altitude limit, if applicable
- Condition being reported
- Reason, if needed
- Remarks (optional)
- Schedule, if applicable
- Start and end time (anticipated duration of condition) or self-cancelling conditions. Start and end times are a required entry in the NOTAM Manager system.

## Responsibility for Filing Notices to Airmen

Personnel should be designated and trained to control NOTAM filings for the airport. Airports that have no staff or a very small staff may consider training and authorizing the FBO or other tenant personnel to issue NOTAMs on behalf of the sponsor or owner. The preferred method of issuing NOTAMs is digitally by using the NOTAM Manager system. An alternative is the eNOTAM II (ENII) system, which is similar to NOTAM Manager but lacks some of the direct entry functionality. Calling the controlling FSS for the airport is the least desirable method but is acceptable if the other methods are not accessible. Nationwide, Flight Service can be reached at (800)-WX-BRIEF, and the call can be routed to the controlling FSS.

Airports not using the NOTAM Manager system are responsible for providing and keeping an up-to-date list of airport or tenant employees who are authorized to issue NOTAMs to the FSS air traffic manager. At public airports without an airport manager, the FSS air traffic manager will coordinate with the appropriate airport operating authority or owner to obtain a list of persons

delegated to provide NOTAM information. Using authorized airport personnel will help expedite the NOTAM processing, because information obtained from unauthorized personnel must be confirmed and authenticated by the FSS before a NOTAM is issued. Authorized airport personnel who do not have access to NOTAM Manager or applicable NOTAM system technology can submit information for NOTAMs to the FSS.

Airport operators should use the NOTAM Manager, as described in its user's guide, as the preferred and most effective method for entering NOTAMs into the system. NOTAM Manager uses drop-down menus, which standardizes entry. It also reduces or eliminates the time-consuming, free-form NOTAMs that need human intervention and interpretation before issuance. Airport managers are encouraged to register designated airport representatives with Federal NOTAM System Airport Self-Certification. Following registration, an FAA representative will contact the airport and establish additional NOTAM Manager account information. This information may include the development of a map of the airport with important landmarks, such as runway and taxiway intersections or quadrants and major aprons, which may be designated when entering NOTAMs. This map will provide a visual of the area of the airport for which the NOTAM is being issued, providing an added layer of certainty that the NOTAM is being reported as intended.

Use of the digital NOTAM Manager speeds up dissemination of safety-critical information into the FNS to a matter of seconds and allows authorized airport representatives full control over the status of their facility's NOTAM information. When issuing NOTAMs in the system manager, the required abbreviations and contractions will be automatically inserted during the filing process. When using the NOTAM Manager, the issuer will receive an email confirming that the information has been received. Confirmation of NOTAM cancellations will also be emailed. This feature is useful in the retention of records as required. Additional email addresses can be added to the account to provide copies of the NOTAM issuance or cancellation to selected tenants, users and the airport traffic control tower (ATCT).

The official ICAO contractions and abbreviations required to be used when issuing a NOTAM are located in FAA Order JO 7340.2: Contractions, and the allowed exceptions are found in FAA Order JO 7930.2: Notices to Airmen (NOTAM). Complete words or phrases must be used when the word or phrase is not an approved ICAO contraction. When using NOTAM Manager, the required contractions, when available, will be inserted into the NOTAM.

## 4.3 Airport Emergency Plans

### Key Insights

*On-airport emergencies and natural disasters can occur without warning. Having a comprehensive emergency plan can be invaluable in minimizing the loss of life and property and in minimizing facility downtime.*

*Airports present a critical community resource for disaster response and post-disaster recovery.*

*Airports should have plans that address emergency and disaster situations in order to minimize downtime and to maintain regular operations to the maximum extent feasible.*

*Coordination should be undertaken in concert with the federal, state and local emergency response and operations authorities for effective facility-resiliency planning.*

### Key Definitions

**Geographic information system (GIS)**: A system designed to capture, store, manipulate, analyze, manage and present spatial or geographic data.

**Hard resiliency**: The direct strength of structures or facilities and their ability to absorb and function under the impacts of a natural or man-made disaster.

**Incident Command System (ICS)**: A standardized on-scene incident management concept designed to allow responders to adopt an integrated organizational structure equal to the complexity and demands of any single incident or multiple incidents without being hindered by jurisdictional boundaries.

**Mutual aid agreement**: A voluntary, noncontractual arrangement to provide short-term emergency or disaster assistance between two or more entities. It typically does not involve payment, reimbursement, liability or mandatory responses.

**National Incident Management System (NIMS)**: A systematic, proactive approach to guide departments and agencies at all levels of government, nongovernmental organizations and the private sector in seamlessly working together and managing incidents involving all threats and hazards—regardless of cause, size, location or complexity—to reduce the loss of life, loss of property and harm to the environment.

**Soft resiliency**: The ability of operational systems, including human resources, to absorb and recover from the impacts of disruptive events without fundamental changes in function or structure.

### Need for Emergency Plans

It is essential that airports of all sizes plan and prepare in advance for emergency situations. The FAA Advisory Circular 150/5200-31: Airport Emergency Plan can help the airport operator develop and implement an airport emergency plan. The FAA Great Lakes Region also has an airport emergency plan checklist to assist in preparing the plan. In addition to planning for an emergency on the airport, an airport emergency plan should include planning provisions for providing support for the community during any crisis or emergency situation.

Depending on the scale of the event, airport emergencies and impacts from disasters, man-made and natural, tend to go beyond operational disruptions. Such events financially

affect the airport and challenge the facility's hard and soft resiliency. When preparing for or planning to respond to emergencies, an airport should seek multiple avenues to increase its resiliency to high-impact events and establish practices that mitigate its short- and long-term impacts from these events.

If possible, emergency preparedness should aim to prevent emergencies from occurring, but failing that, airports should develop a good action plan to mitigate the results and effects of any emergencies. As time goes on and more data becomes available, usually through lessons learned, the plan should evolve and continue to improve. Developing emergency plans is a cyclical process. The plan should be reviewed and updated as necessary, at least annually. The plan should address such things as storms common to the region, such as tornadoes and hurricanes; aircraft accidents; terrorist attacks; and off-site disasters. During off-site disasters, a portion of the airport may be required to house recovery teams, such as electric providers, military personnel and the American Red Cross or Salvation Army.

## Establishing Mutual Aid Agreements

Mutual aid agreements can be critical to the successful execution of the airport emergency plan, by promoting the safety of the first responders and those involved in the incident while establishing practices to minimize disruption to airport operations. Having a reciprocal agreement with one or several different airport sponsors prepares the airport to respond to an event that would exceed the availability of its own local resources, such as personnel, equipment, materials and other applicable emergency response services. Although such agreements are primarily linked to the response phase of emergency management, they constitute a crucial element of successful emergency operations planning and can aid in the mitigation and recovery phases of emergency management. Local mutual aid agreements for fire, police, maintenance and engineering support are very common and beneficial for ensuring an adequate first response and recovery from an airport-related emergency.

When developing a mutual aid agreement, airports should include, at a minimum, the following:

- Definition of terms used in the agreement
- Identification of the parties and their roles and responsibilities
- Purpose of the agreement
- Procedures for assistance requests and response
- Procedures and responsible parties for cost reimbursement and allocation
- Expectations of the parties
- Notification procedures and communication between parties
- Response time
- Access and staging points
- Insurance requirements (i.e., worker's compensation, liability and immunity matters)
- Training requirements
- Practice exercises (how often and type of exercise, e.g., tabletop, mock drill)
- Termination clause and procedures

Airport sponsors or managers should contact their state emergency response agencies for possible additional requirements or recommendations for developing a mutual aid agreement specific to their local regulatory environment. Additionally, *ACRP Synthesis 45: Model Mutual Aid Agreements for Airports* contains a broad range of helpful information for airport managers preparing mutual aid agreements.

## Familiarizing First Responders with the Airport Before an Emergency

The next element of airport emergency planning involves familiarizing first responders with the airport to promote safety and efficient response. Familiarization with the airport operating environment is critical to ensure that first responders do not endanger themselves or airport patrons while responding to an emergency. That training and familiarization exercise should include, at a minimum, the following:

- Airport-specific driver training class
- Overview of the ingress and egress points for response
- Overview of staging areas and discussion of staging procedures and limitations
- Alert status definitions, e.g., Alert 1, Alert 2 and Alert 3
- On-airport communications procedures
- Visit to the ATCT, as applicable

Because first responders do not frequently operate at the airport, prepare a map of the airport they can keep in their vehicles.

The key to this effort's success is not only in the content and efficiency of the familiarization exercise but in systematic and repeated opportunities for first responders to gain familiarization with the airport. Because the local first responders rarely need to respond to on-airport accidents or emergencies, such training and repetition would keep the procedures and on-airport response requirements fresh. The National Transportation Safety Board (NTSB) has a brochure, "Responding to a Transportation Accident," that explains how law enforcement and public safety personnel can support the NTSB during the on-scene phase of an aviation accident. The NTSB also offers courses for first responders through the NTSB Training Center.

## Emergency Exercises

An emergency plan is only as good as the paper it is written on. To make the plan effective, training should be conducted and include internal people, contractors, airport stakeholders and civil protection partners. The plan should state the nature and frequency of training and testing. A plan's effectiveness should be regularly tested. When several businesses or organizations occupy the same space, joint emergency plans, formally agreed to by all parties, should be put in place. To ensure plan effectiveness even for those airports where exercises are not a requirement, annual or semi-annual tabletop exercises are highly recommended.

While all Part 139 airports, per FAR §139.325, are required at least once every 12 consecutive months to review their emergency plans with all parties with whom the plan is coordinated, Class I Part 139 airports are required to hold a full-scale emergency plan exercise at least once every 36 consecutive months. As previously stated, all small airports can benefit from periodically conducting tabletop and full-scale emergency exercises. *ACRP Synthesis 72: Tabletop and Full-Scale Emergency Exercises for General Aviation, Non-Hub and Small Hub Airports* provides example exercises and sample emergency exercise materials for small airports. Emergency communication is also important for all airports to preplan. When conducting emergency exercises, the emergency communications plan should also be reviewed and practiced. *ACRP Synthesis 73: Emergency Communications Planning for Airports* provides information on airport emergency communication plans.

## National Incident Management System

According to the Federal Emergency Management Agency (FEMA), NIMS is a systematic, proactive approach to guide departments and agencies at all levels of government, nongovernmental organizations and the private sector to work together seamlessly and manage incidents involving all threats and hazards—regardless of cause, size, location or complexity—to reduce the loss of

life and property and harm to the environment. NIMS is the essential foundation to the National Preparedness System, developed with the purpose to provide a common approach to managing incidents in the areas of emergency prevention, mitigation, response and recovery.

NIMS was developed to provide the capabilities required across a community to prevent, protect against, mitigate, respond to and recover from the threats and hazards that pose the greatest risk. These risks include events such as natural disasters, disease pandemics, chemical spills and other man-made hazards, terrorist attacks and cyberattacks. The FEMA web page on NIMS provides information and training resources.

A key feature of NIMS is the standardized Incident Command System (ICS) developed to improve the effectiveness and efficiency of response to incidents of various sizes and types. Because of its standardized nature and scalability, the ICS can cover a broad spectrum of events and can assist responders in organizing a response in the immediate as well as the long-term time frame. The system is used by a variety of agency types and levels and is structured to streamline and standardize the activities in the following areas:

- Command: Chain of command, establishment and transfer of command functions, etc.
- Operations: Modular organization, safety of response, execution of response operations, standardization of titles and terminology.
- Logistics: Establishment and management of transportation, communication, supply, maintenance/fueling, food and medical services for incident personnel and off-incident resources. Housing availability should be planned for responders from outside the area.
- Planning: Incident action planning for the overall incident response plan, including demobilization planning. Collects, evaluates and disseminates information on the current and forecast situation and the status of resources assigned to the incident.
- Finance and administration: Management of all financial aspects of an incident, cost analysis, compensation and claims handling for responding agencies. Detailed and accurate financial records will be required for FEMA reimbursements.

FEMA's Emergency Management Institute (EMI) offers a broad range of free online and classroom courses that provide entry- to advanced-level training in NIMS and ICS functions and application. Airport managers and staff should consult EMI's web page for additional information. Numerous state emergency management agencies also provide free training to state public agencies and responding personnel. Please contact your local or state emergency management authorities for additional information. Airport managers may be required to complete NIMS training as part of their community's emergency plan and preparedness exercises.

## Resiliency and Airport Preparedness

The role of an airport as a critical community disaster-response-and-recovery asset is frequently overshadowed by the primary and more obvious roles that the facility serves in the course of its regular business. However, the value of the airport's capabilities to support local disaster preparation, response or recovery efforts—as an equipment-and-supply staging area, a primary point of rapid access to the community by disaster responders and operations or as a refueling area for disaster response air assets—cannot be overstated.

Airports of all sizes can play an important role in disaster recovery, if they can stay functional because of emergency preparedness.

Protecting and preparing the airport to serve in that role is critical to the management's success in carrying out that mission. Overall, airport preparedness for natural and man-made impacts spans three key elements:

- Emergency support preparedness
- Proactive resiliency planning and concept implementation
- Planning for post-disaster recovery

Airports can have a broad range of physical assets that could be vulnerable to man-made disasters, climate change and natural disaster impacts. Airports should assess these potential vulnerabilities and plan for long-term resiliency to pre-empt anticipated impacts. ACRP resources, such as the Airport Climate Risk Operational Screening tool available as a part of *ACRP Report 147: Climate Change Adaptation Planning: Risk Assessment for Airports*, can assist airport managers in conducting such assessments.

## Emergency Support Preparedness

When planning for an emergency, several items must be considered. Steps must have been taken to make sure that all facilities have been strengthened as much as possible to minimize damage and preserve their functionality after the event. Storm shutters, roof hardening, emergency generators and vehicle storage areas should be considered. Areas for the protection of records and IT equipment should also be identified. Rest areas for staff should be designated. Emergency supplies, including medical supplies, water, food and a sufficient supply of fuel, should be on hand. For emergencies that may not have a long warning time (tornadoes, terrorist attacks), these supplies should be maintained to ensure operational capability for 7 to 10 days, depending on the threat level of the area.

In some emergencies, all personnel may not be able to return to work immediately after the event due to closed roads, personal losses or other influences. A chain of command should be established to ensure that one or more individuals with the authority for decision making are onsite during the emergency.

Communication is one of the key issues during any emergency. After the initial assessment of the facility, the operational capability should be communicated to appropriate personnel. Completing this assessment quickly and accurately will allow agencies responding to the event to know what to expect on arrival.

## Airport Resiliency

In general terms, resilience is the ability to sustain and recover from adversity and return to normal conditions or operations. Airport resiliency, like any other infrastructure resiliency, is characterized by hard resiliency and soft resiliency qualities and measures.

With regard to infrastructure, hard resiliency refers to the measures that prepare, strengthen and reinforce the various physical elements of infrastructure to deal with potential natural and man-made threats. As an example, such measures may include increased structural rigidity to withstand high wind loads, architectural design that creates physical barriers and standoffs to man-made threats, or material selection or strengthening that protects the structure and its occupants from destruction during a disaster.

Soft resiliency refers to the capability of an organization's human resources to deal with the impacts of disasters or other extraordinary events. Such events can be a natural disaster, or even circumstances such as a severe flu epidemic, government shutdown or staff furlough. The soft resiliency measures serve to prepare and rehearse the command structure, communication and mutual aid channels and methods of addressing specific threats and circumstances. They do so by providing the appropriate people access to the necessary tools, capital and equipment, building in cross-departmental and internal staffing redundancies and giving staff the appropriate level of emergency authority.

Short-range resiliency planning should be incorporated into the foundations of the irregular operations (IROPS) plans and emergency preparedness processes at the airport. While

commercial service airports have specific IROPS plan requirements, all airports should plan for irregular operations. This planning should include input from airport planning, environmental, engineering and maintenance staff, as appropriate to the airport. While typical severe weather can be managed and addressed with relative ease through existing practices, unusual weather events, catastrophes or even unusual human impacts on airport operations warrant a risk assessment by airport staff. Based on the likelihood of specific events and the severity of potential impacts, the findings of such assessments should be incorporated into the short- and mid-range airport capital improvement programs (i.e., design considerations, structural rigidity considerations, security features, etc.). A similar approach should be made to evaluate the soft resiliency of the airport operations and develop recommendations on how to address organizational vulnerabilities, such as staff sharing the airport sponsor's resources, mutual aid organization participation and IROPS planning and exercises.

When it comes to long-range resiliency planning, the potential impacts from climate change should also be considered. Climate change research indicates that airports will be subjected to a broad range of potential effects, which span impacts on physical infrastructure, increased security demands and impacts on business opportunities and airport finances. When planning for hard and soft resiliency due to climate change impacts, airports should consider the various elements of potential impacts (e.g., sea-level rise) and examine the forecasts of projected impacts. Long-range planning should be incorporated as a part of the fundamental airport master planning process, as well as the airport asset management and maintenance practices. Best practices and tools are available to help airports identify their vulnerabilities and facility elements that will be affected, such as *ACRP Synthesis 33: Airport Climate Adaptation and Resilience* and *ACRP Report 147*.

## Post-Event Recovery

The ability of the airport to effectively recover from an event of any nature or magnitude goes beyond the fiscal impacts of irregular operations. The study that resulted in *ACRP Synthesis 60: Airport Emergency Post-Event Recovery Practices* indicates that even the perceived level of success or failure of an airport's recovery affects the airport's public image and standing in the community. Because negative public image and goodwill affect a broad range of airport matters, effective, efficient and successful recovery is critical to the airport manager's success. More importantly, the key "metric" of perceived successful airport recovery is the speed of the airport's return to normal operations, because no industry-wide accepted metrics exist to quantify the success otherwise.

*ACRP Synthesis 60* found the following three key qualities of a successful recovery:

- Awareness: This quality covers situational awareness, such as inclusive and transparent communication of emergency conditions to all of the critical players, as well as the knowledge of and utilization of all available emergency response systems (e.g., NIMS/ICS) and resources (municipal or county emergency operations center).
- Planning: Planning for a successful recovery, through developing either continuity-of-operations plans or hazard- or incident-recovery plans as a part of the overall airport emergency plan or a combination thereof, strengthens the airport's soft resiliency and promotes a speedy recovery.
- Flexibility: No plan fully survives its first application to a real-world event; flexibility and recovery alternatives are the last, but likely most important, key qualities of a successful recovery. Developing that flexibility and operational redundancy comes in many forms, such as cross-training staff to handle different areas of recovery. Flexibility is ultimately based on clear communications and established relationships between the various stakeholders and a clear understanding of desired final outcomes.

Establishing mutual aid relationships and using standardized approaches such as NIMS/ICS during the recovery phase of the emergency response are essential elements of effective response. In addition, *ACRP Synthesis 60* found that developing, training with and implementing a real-world, comprehensive crisis communication plan is indispensable during the response and recovery stages. The synthesis contains additional valuable information and suggested best practices that will assist airport managers in developing or fine-tuning their airports' post-event recovery plans.

Post-disaster resiliency should focus on identifying critical players for post-disaster recovery; participating in airport-specific, mutual aid organizations (e.g., Southeast Airport Disaster Operations Group); and identifying recovery priorities (i.e., which facility elements must be brought back online first). Incorporating resiliency into the post-event and post-disaster recovery should focus primarily on soft resiliency measures, because the key goals of the post-event time frame will be on airport safety, a return to normal airport operations, the preservation of compromised infrastructure and recording lessons learned for eventual debriefing.

Because post-disaster recovery is frequently hampered because people who work at the facility are affected by the disaster, qualified staff that will be available to assist at the airport should be identified through mutual aid agreements, and critical facility information (e.g., location of electrical vaults, access information) should be centralized, but protected. These steps give airport management the leeway to release their regular staff to tend to family and household disaster recovery, while relying on mutual aid airport staff from areas unaffected by the disaster to help.

Additionally, airports can voluntarily identify certain critical pieces of equipment and material, such as lighted Xs, generators, sand bags, etc., to be loaned to other facilities following a disaster. This type of information should be available in an electronic database and protected from unauthorized access, but made readily available to responders with authorized access. In the event that staff at the affected facility are unavailable to respond and provide the needed information access, state aeronautics agencies or local governments can serve as a centralized resource for such information.

## Integrating a Geographic Information System into Airport Emergency Management

With so many areas of emergency management dependent on the availability, quality and timeliness of information, GIS can serve as an effective measure of improving the accessibility and accuracy of information for facility emergency preparedness, resiliency assessments and post-disaster recovery.

The availability of data and the ability to identify various elements of the airport's infrastructure can be helpful in creating maps for response and exercises and in conducting life-cycle or post-disaster infrastructure evaluations with a GIS-based moving map. The use of GIS as a common platform also improves the ability of the airport to coordinate emergency management functions with the state and local emergency operations and response teams. Coordination with the airport sponsor's GIS resource staff or with state and local emergency management authorities should serve as a starting point in the assessment of potential data needs and integration benefits.

*ACRP Report 88: Guidebook on Integrating GIS in Emergency Management at Airports* provides a general overview of the various uses of GIS in emergency management, with an emphasis on best practices. The report also offers guided best practices for developing a GIS emergency management initiative, while providing an in-depth look at the fundamentals of GIS for airport operations and emergency management staff.

## 4.4 Fueling Operations

### Key Insights

*Fueling operations at airports can be conducted by a private entity, via an agreement with the airport owner, or by the airport owner and may be full service or self-service.*

*The public entity owning the airport has the right to elect to be the exclusive fuel provider; however, consideration must be given to existing contracts as well as the costs and projected income from fuel sales, before exercising such rights.*

*Fuel sales are typically a major source of income at an airport.*

*The FAA is in the process of developing a replacement fuel for 100 octane low-lead (100LL) aviation gasoline, used by piston-powered aircraft.*

*The proper condition and operation of fuel storage and delivery equipment are critical to the safe operation of aircraft.*

### Key Definitions

**Avgas**: Aviation gasoline used by piston-powered aircraft.

**Fixed-base operator (FBO)**: A commercial business granted the right by the airport sponsor to operate at an airport and provide aeronautical services, such as fueling, hangaring, tie-down and parking, aircraft rental, aircraft maintenance, flight instrument, etc.

**Fuel flowage fee**: A fixed fee added to each gallon of fuel pumped or percentage added to fuel purchased at the airport to support airport operations, which is generally collected from a private entity that provides the fueling services and remitted to the airport owner.

**Into plane fee (ITP)**: The fee charged to the fuel recipient for providing the fueling service when the recipient has prepurchased the fuel.

**Jet A**: A type of aviation fuel used in aircraft powered by gas-turbine engines.

**Mogas**: Automotive fuel that is used in some aircraft with the proper FAA certifications.

**Split load**: The term applied to the purchase and delivery of less than a full tanker of fuel.

### Fueling Options

There are three types of aircraft fueling:

- Full service: The entity selling the fuel also delivers it into the aircraft by refueling the aircraft.
- Self-service: An entity offers fuel for sale at an airport, but the pilot purchasing the fuel refuels the aircraft.
- Self-fuel: The aircraft operator provides the fuel and refuels the aircraft with its own employees.

Some airports also offer assisted/self-service, for which assistance is available while the airport or FBO is attended, and self-service is available during the remaining hours. Historically, most fuel offered for sale at airports was full service, either from a truck that delivered the fuel to the aircraft or from a pump that the aircraft parked adjacent to. More recently, self-service systems are becoming more common at airports, especially smaller airports.

As described in FAA Order 5190.6, Chapter 11: Self-Service, under FAA Grant Assurance 22, Economic Nondiscrimination, an airport sponsor "will not grant any right or privilege which

operates to prevent any person, firm or corporation operating aircraft on the airport from performing any services on its own aircraft with its own employees (including but not limited to maintenance, repair and fueling) that it may choose to perform." Thus, an aircraft owner has a right to self-fuel with its own employees, including bringing fuel to the airport, providing it is in conformance with the airport's rules and regulations.

## Fueling Equipment

While historically aviation fuel sales were provided by private entities, as it has become more difficult for small airports to support the operations of a full-service FBO, more small airports are undertaking fueling operations. These small airports conduct fueling to better control customer service levels, to directly receive the revenue from the sales to support airport operations or to ensure fuel is available for purchase. There are also some small airports that own the fueling equipment and lease it to a private entity for its operation. *ACRP Synthesis 63: Overview of Airport Fueling Operations* provides additional information on common fueling practices at airports. FAA Advisory Circular 150/5230-4: Aircraft Fuel Storage, Handling, Training and Dispensing on Airports contains specifications and guidance for fueling operations at airports and is the acceptable means of compliance for Part 139 airports. In addition to the operational requirements, small airports that consider undertaking fueling operations with their staff also need to be sure they consider the resulting training, insurance and budgetary requirements.

### *Storage Tank Size*

The type and size of the equipment for storage and delivery should be based on the type of aircraft using the airport, the number of operations and the amount of fuel consumption. A key factor in the size of the fuel storage system is the ability to receive the delivery of a full load of fuel. Fuel tankers usually carry about 8,800 gallons, so the installation of a 10,000- to 12,000-gallon tank is required to allow the fuel to be delivered prior to the tank being empty. While many suppliers will deliver split loads for avgas, split loads typically cost more per gallon. Thus, if the budget permits, a 10,000-gallon avgas storage tank should be considered. Suppliers typically cannot deliver split loads of Jet A because of the configuration of the delivery vehicle.

Above-ground and underground fuel tanks are available in 10,000- to 12,000-gallon sizes. Many airports replacing fuel systems are transitioning to above-ground fuel tanks. While there are environmental regulations for both types of systems, if space is available, an above-ground tank with appropriate containment is preferable, because it reduces direct exposure of contaminants to the ground. It also places more of the system in view to allow its condition to be monitored.

Some aircraft are certificated to use mogas. Therefore, the installation of a tank to dispense this type of fuel may be considered. It is important that the fuel vendor considering the sale of mogas ensures its fuel insurance covers the sale of mogas so as not to jeopardize its insurance coverage for avgas and Jet A. Mogas is generally less expensive than avgas, so it can be an attractive option for certain aircraft operators.

As new unleaded aviation fuel options are entering the market, airport managers may consider installing tanks to offer this product. The potential demand for the product, especially by based users, should be assessed as part of the process as well as the return on the investment. As long as volumes are adequate, certain fuel vendors will offer airports the entire fuel system and build the cost into the per-gallon price being charged.

When contemplating a fuel storage installation, coordinate with the local fire marshal early in the process.

### *Tank Siting Considerations*

Fire code considerations will dictate the areas available for the tank location and the delivery vehicle staging areas. Fire code requirements vary from state to state and even from county

to county. It is essential to know the local requirements for your airport. Typical fire code considerations include the following:

- Location: Distance from buildings and the airport property boundary should be specified in the local fire codes and must be considered when identifying available sites. Proper location regarding the airfield, safety areas and movement areas should also be considered.
- Availability of a permanent power supply: Locating the fuel system as close as possible to an existing power supply can reduce installation costs. Consideration may also be given to providing an emergency power supply to ensure fuel availability during power outages.
- Proper grounding/bonding: The area selected for the fuel system should be tested to make sure it is conducive to proper grounding.
- Fire extinguishers: Fire extinguishers of the size and type specified by the fire code will need to be available at the site of the fuel system.
- UL approval: All electrical systems must conform to UL requirements for fuel storage installations.
- Proper venting: Tanks must be vented in a manner so as to not allow water intrusion.
- Separation between tanks: If more than one tank will be installed, the separation required by the fire code must be observed. If only one tank will be installed, consideration should still be given to identifying an area that is suitable for the installation of more than one tank, with proper separation provisions to allow for future growth.
- Signs: The product type must be labeled on each tank, and NO SMOKING signs should be located on each side of the containment fencing of the storage area. Also, all fuel piping must be properly labeled.
- Emergency shut-off: Emergency shut-off must be accessible and installed in compliance with National Fire Protection Association (NFPA) 30 and NFPA 407.

There are also numerous environmental and permitting considerations related to fuel tank equipment:

- Secondary containment: The secondary containment volume of a single storage tank must be at least 110 percent of the tank's capacity. Facilities with more than one tank must have secondary containment of at least 150 percent of the largest tank's volume, or 10 percent of the total volume of all containers, whichever is greater. Secondary containment may also need to be provided for fuel delivery vehicles when not in use. Provisions may also be needed to provide secondary containment when the fuel is being delivered into the tank from the supplier, such as a diked delivery area.
- Guard post protection: Steel bollards of at least a 4-inch diameter, spaced at 4-foot intervals and set 3 feet in concrete, are necessary to prevent inadvertent damage to the storage tanks and dispensing equipment and must be installed and spaced at acceptable intervals.
- Leak detection devices: Installation of an approved leak detection device is required for underground tank installations where underground tanks are allowed. While leak detection devices have an upfront cost, they can save the operator money by identifying the need for repairs before excessive fuel loss is experienced and costly spill cleanup is required. The Environmental Protection Agency (EPA) provides resources about underground storage tanks.
- Disposal of sump fuel: An approved container for disposal should be located at the storage site. The container should be checked during site inspections to ensure the waste is discarded before the container is full. Arrangements should be made with an approved environmental contractor for the disposal of all waste fluids. Containers should also be provided for aircraft owners who sump their aircraft during the preflight inspection.
- Spill Prevention, Control and Countermeasure (SPCC) plan: An SPCC plan is required by the EPA (40 CFR §112.7) for any facility with above-ground oil-storage capacity of greater than 1,320 gallons or a buried oil-storage capacity greater than 42,000 gallons with a

reasonable potential for discharge into or on navigable waters of the United States. Preparation of this plan allows the operator to proactively consider how spills will be contained and managed.

## On-Airport Delivery Vehicles

### *Vehicles*

Delivery vehicles used on the airport come in a variety of sizes, depending on the type of fuel delivered. When determining the size for a vehicle, consider the amount of fuel being pumped and the type of aircraft using the fuel. For example, if fuel delivery is primarily to small, single-engine aircraft, a 250- or 500-gallon tanker may suffice. If larger corporate aircraft are regularly serviced, the delivery vehicle will likely need to be larger. Separate vehicles are needed for avgas and Jet A and must be clearly identified. Vehicles can be purchased or leased in new or refurbished condition. The cost of the vehicle will increase with the gallon capacity of the vehicle.

### *Self-Service*

Self-service fueling may also be considered. A trend in aviation fuel sales is the increasing availability of self-service fuel, especially for avgas, with automated card readers. These self-service systems not only reduce staffing and delivery vehicle costs, they also enable small airports to make fuel service available all the time. At some small airports, self-service fuel may be the only fuel available. At busier small airports, an FBO may offer self-service and full-service options. Jet A self-service may also be considered but is typically not cost effective, because jet operators usually desire a higher level of service.

## Employee Training

All line service personnel should take line service certification courses. Most aviation fuel suppliers and the National Air Transportation Association (NATA) provide online classes for line service personnel. Personnel should also receive on-the-job training from a certified line service supervisor prior to servicing aircraft unsupervised. In 2015, the EPA established minimum training requirements for underground storage tank operators. States may have additional or more restrictive training requirements.

Line service personnel should be familiar with the following fuel delivery methods:

- Overwing and single-point: There are two basic methods of delivering fuel to aircraft: over-the-wing and single-point. Overwing fueling, often referred to as gravity fueling, is very much like refueling an automobile, in that a refueling port is opened and the fuel is delivered manually through a nozzle. Single-point refueling, sometimes called pressure refueling, is accomplished by attaching a single-point nozzle to the aircraft and controlling the flow from the delivery vehicle.
- Defueling: Sometimes defueling of an aircraft is necessary. The most common reasons to defuel an aircraft include fuel contamination and maintenance requirements. Line service personnel should be familiar with this operation.
- Bottom loading: This is the preferred method of offloading the delivery vehicle from the supplier to the fuel storage tanks. The fuel is dispensed from the bottom of the delivery fuel truck tank and pumped through a hose into the storage tanks.

A fuel delivery instruction checklist for overwing and single-point refueling, defueling and bottom loading is in *ACRP WebResource 6*.

## Fuel System Inspections

If an aircraft incident occurs where it has been fueled, a fuel sample should be immediately taken from the appropriate storage tank and the fuel delivery vehicle.

Airports that conduct the fueling operations should conduct a daily inspection on aircraft fueling facilities, including the fuel storage area and, if applicable, the fuel delivery vehicles. A fuel system inspection checklist template that can be adapted for airport-specific use is contained in *ACRP WebResource 6*. Airports on which another entity provides fueling operations should still conduct a daily inspection of the fueling systems as part of the airport inspection, to identify any potentially emerging issues.

### *Fuel Storage Inspections*

Areas that should be inspected on the fuel storage area include the following:

- Tank and filter sumps: Drain and check for the presence of water and contaminants. If water is found, the sump should continue to be drained until no water is detected in the sample.
- Hoses and fittings: Check for leaks, damage and excessive wear.
- Nozzles and couplings: Check for leaks, proper connection and damage.
- Bonding/grounding cables: Ensure proper operation.
- Entire storage area for leaks: Visually check the for indications of leaks.
- Fire extinguishers: Ensure the proper size and inspection date is within tolerance.
- Transaction equipment: If so equipped, check for the proper operation of automated equipment.
- Sump storage container: Inspect for leaks and check the level to see if it needs to be emptied.
- Security: Ensure the area is secured to prevent tampering or theft.
- Fuel level: Check to ensure adequate fuel for sale. Identify a range in which additional fuel needs to be ordered to allow an opportunity to monitor for the best price before the order is placed.

### *Fuel Delivery Inspections*

Fuel delivery vehicle inspections include the following:

- General vehicle condition: Inspect for obvious damage that could hamper the safe operation of the vehicle.
- Filter sumps and tank sumps: Drain and check for water and contaminants.
- Filter pressure differential: Check to make sure it is within tolerance.
- Deadman controls: Check for proper operation.
- Brake interlocks: Ensure the brakes must be locked before the power takeoff can be engaged to initiate delivery.
- Nozzles and hoses: Inspect for proper operation and excessive wear and tear. With a self-service system, check any automated retractable hose system for proper operation.
- Tank covers: Inspect for proper seal to prevent water intrusion.
- Ground reels, cables and clamps: Check for damage and proper operation.
- Fire extinguishers: Check for proper size and inspection date is within tolerance.
- Tanker—bottom loading: Check for proper operation.
- Air tanks (if air-brake equipped): Check for damage and ensure they are holding air.
- Spill kit: Inspect to ensure all required equipment is contained within the kit.
- Visual leak check: Conduct a visual check for leaks.

### *Oversight of Privately Operated Systems*

Fuel systems owned or operated by private entities should also be inspected daily by the airport operator. This inspection should, at a minimum, concentrate on a quick inspection for the most common problems concerning compliance with local fire safety codes at fuel storage

areas and with mobile fueling vehicles. During the daily inspection of aircraft fueling operations, the inspector should verify the following:

- Proper procedures: Determine if the fueling operator is permitting any unsafe fueling practices or is in violation of local fire code, such as failing to bond aircraft with the mobile fuelers during fueling operations, allowing fueling personnel to smoke while fueling aircraft or failing to have required fire extinguishers.
- Fuel farm control: Check to ensure that the appropriate signs for the fuel farm are installed and that all gates are locked, except when the facility is occupied by an authorized user. Also verify that security, fire protection, general housekeeping and fuel-dispensing procedures are being followed.

The airport owner should report and monitor any unsafe fueling practices and violations of local fire codes. *ACRP Legal Research Digest 28: Operational and Legal Issues with Fuel Farms* provides guidance on the operational issues of fuel farms that provide the storage and dispensing of aviation fuels to airport users.


At Part 139 airports, this function should include reporting any noncompliance with fuel fire safety procedures specified in the FAA-approved airport certification manual.

## 4.5 Security

### Key Insights

*The level of security will vary with the size and complexity of the airport, but since the events of September 11, 2001, airport security is an issue that needs to be addressed by management for all airports.*

*The airport security plan/program should be a protected document. A list of those entities with a "need to know" should be maintained by airport management.*

### Key Definitions

**Aircraft operations area or air operations area (AOA)**: Any area of the airport used or intended to be used for the landing, takeoff or surface maneuvering of aircraft, including runways, taxiways and, in some cases, ramp areas.

**Stakeholder**: A person, group or organization that has interests or concerns in the airport and can affect or be affected by the airport's actions, objectives and policies, examples of which are employees, tenants, first responders and airport traffic control tower personnel.

**Transportation Security Administration (TSA)**: An agency of the U.S. Department of Homeland Security responsible for protecting the U.S. transportation systems and the traveling public.

**Transportation security regulations**: Regulations issued by the Transportation Security Administration in 49 CFR Parts 1500 to 1699.

### Airport Security Program Requirements

With the creation of the TSA after the events of September 11, 2001, the airport security requirements moved from CFR Title 14 to Title 49 parts referred to as the 1500 series.

While most of the security regulations apply only to commercial aircraft operations and the airports they serve, some security regulations are applicable to operations at GA airports. The aircraft operator security programs fall into one of five categories: full, partial, all-cargo, private charter or 12-5 rule (aircraft weighing more than 12,500 pounds).

The full security program applies to aircraft operators with aircraft having 61 or more seats. Airport security related to commercial passenger operations is described in Section 7.1: Transitioning to Commercial Air Service. Some individual states have adopted specific regulations that pertain to and may exceed the minimum federal airport security criteria outlined in 49 CFR Parts 1540 through 1562. Due diligence should be exercised in ensuring that the airport sponsor complies with the criteria established and administered by the state aeronautics agency.

While no security regulations are in place for airports without commercial service, the Aircraft Owners and Pilots Association (AOPA) created an Airport Watch Program and national hotline (866-GA SECURE) to report suspicious activity. Also in 2017, the TSA published an updated Security Guidelines for General Aviation Airport Operators and Users to provide options, ideas and support for airport owners and operators and tenants of GA airports. In summary, these guidelines recommend the following:

- Tighter identification of passengers that fly on private planes (passengers must be known or identified by the pilot, along with the baggage or cargo)

**49 CFR 1500 SERIES SECURITY REGULATIONS**

Part 1500 – Applicability, Terms and Abbreviations
Part 1503 – Investigative and Enforcement Procedures
Part 1520 – Protection of Sensitive Security Information
Part 1540 – Civil Aviation Security: General Rules
Part 1542 – Airport Security
Part 1544 – Aircraft Operator Security
Part 1546 – Foreign Air Carrier Security
Part 1548 – Indirect Air Carrier Security
Part 1550 – Aircraft Security Under General Operating and Flight Rules (12-5 Rule)
Part 1552 – Flight Schools
Part 1562 – Operations in the Washington, D.C., Metropolitan Area

- Closer monitoring of student pilots and improved airport surveillance (controlled access to aircraft)
- Establishing procedures to identify transient pilots and their aircraft, such as sign-in/sign-out
- Use of multiple locking systems to keep unauthorized persons from gaining access to aircraft
- Fencing, locks, lighting, video cameras and other steps to control access onto aircraft ramps, parking, hangar and fuel storage areas (controlling access to the airfield)
- Control of keys and key codes
- Developing communications procedures for law enforcement officers and airport users in an emergency (familiarizing local law enforcement with the airport and operations)
- Use of airport watch programs and security awareness training
- Security precautions for agricultural aircraft operators

These recommendations can be incorporated by small airports through several security-related actions that can also improve the overall safe operation of the airport.

## Security Plan Development

A security plan should be prepared for each airport regardless of size, number of based aircraft, the type of aircraft utilizing the airport or operational count. Although the terrorists used large commercial service aircraft during the events of September 11, 2001 (commonly known as 9/11), corporate jet aircraft are large enough and carry enough fuel (a Gulfstream 550 corporate jet has a fuel capacity of more than 6,000 gallons) to be used to cause harm.

While small airports may not be as desirable a target for terrorists, having and maintaining a security plan has other benefits. Implementing a security program can help guard against theft and vandalism, and airport access restrictions can be very valuable in preventing runway incidents and incursions. *ACRP Synthesis 3: General Aviation Safety and Security Practices* provides insights on, and examples of, security practices at GA airports. The New York State Department of Transportation has specific security requirements for GA airports, which include an airport security plan template. The Ohio Department of Transportation sample general aviation airport security plan provides an editable outline to help an airport develop a security plan.

A security plan will range from simple to complex for small airports with commercial service. Even for the smallest airports, planning for the control of access to the airfield, aircraft and facilities—and an awareness of whom to contact if something out of the ordinary is identified—aids in the provision of a safe and secure facility for users. As the value and size of the aircraft based at a small airport increase, so should the access control and security measures.

Development of a comprehensive security plan should include all stakeholders and include hard and soft security needs. Typically, stakeholder involvement is accomplished by forming a security committee. Not every tenant at the airport needs to be included in the planning, but their interests should be represented.

### *Airport Security Committee*

The establishment of an airport safety or security committee is essential to the success of the airport safety and security programs. These committees can be organized separately or in combination to assist with the development and promotion of the programs.

Establishing the committee at the initial stages of the security program planning process will help ensure that critical areas of the program do not result in unintended consequences, such as unnecessarily restricting access to areas not intended to be restricted; proper consideration is given to access points; adequate access controls are developed; areas for security fencing are detailed; and access control and identification system requirements are determined.

**Common Airport Security Committee Members**

- Airport staff member responsible for risk management
- Airport staff member responsible for maintenance/operations/security
- FBO representative
- Hangar tenant representative(s)
- ATCT representative
- Other tenant representatives

Involving airport tenants in the development of the security program is important and aids in its implementation. If airport tenants view the program as restricting their movement on the airport or those of the sub-tenants or customers, then they can be critical of the program. Commercial tenants may also view the program as adding tasks for their employees, who may be asked to implement or observe portions of the security plan. Involving stakeholders early in the process and providing an opportunity for their input in developing the plan promote ownership in the plan, aiding in the implementation and execution of the resulting security program.

### *First Responders*

Fire rescue and local, county and state police should also be included in the planning stage. These first responders will need access to the airport if there is an emergency. If this access is not considered in the planning stages, response to emergencies may become difficult, if not impossible. Mutual aid agreements with off-site first responders should be developed to ensure everyone is aware of their authority and responsibilities in emergency and standard situations. *ACRP Synthesis 45: Model Mutual Aid Agreements for Airports* addresses the development of mutual aid agreements.

## Security Best Practices

### *TSA General Aviation Security Recommendations*

TSA has published Security Guidelines for General Aviation Airport Operators and Users. These guidelines are recommendations and are not regulatory. This document addresses the types of threats as well as best practice recommendations for security measures.

**Examples of Security Best Practices**

- Ensuring street-side gates and doors are closed and locked at all times
- Closing and locking hangar doors when those areas are unattended
- Securing all key storage areas
- Confirming the identity and authority of each passenger, vendor and visitor prior to allowing access to facilities or aircraft
- Escorting all visitors on the ramp and in the hangar areas
- Requiring a government-issued photo ID to verify identity of any visitor or vendor
- Being aware of your surroundings and not being complacent—challenging strangers
- Actively controlling airfield access to tenants and operationally required individuals only

### *Airport Watch Program*

Every person at the airport is responsible for the security of the airport. Therefore, establishing an airport watch program is a basic first step every small airport should take. The cooperation and involvement of all individuals working at the airport is essential to the program's success, because airport workers can generally recognize someone or something that is unfamiliar. This cooperation and involvement may be accomplished through comprehensive training programs or by sending a notice to each tenant explaining the components and benefits of the program.

## Security Program Elements

The elements of the security program should be tailored to the needs of the individual airport. The various components can be prioritized

"If you see something, say something"—while this phrase may be seen as overused, its practical application can provide invaluable results.

and installed in phases as needed and as budget considerations allow. The technology and equipment available to accomplish the goals of the security program vary greatly.

### *Security Fencing*

Chain link fencing typically is used to secure the AOA or airport perimeter. This can be accomplished in a variety of ways, including installing fencing that is 6 to 10 feet high and may be topped with three strands of barbed wire. For added security, razor wire can be considered but is not typically used, except at larger commercial service airports. The installation of the security fencing can be coupled with wildlife fencing to provide an added level of safety at the airport. When determining the path the security fencing will follow, consideration should be given to remaining clear of runway and taxiway safety and OFAs, staying below the 14 CFR Part 77 surfaces and being cognizant of the terrain, to avoid gaps under the fence. When additional perimeter security is desired or required, the installation of security cameras, fence sensors or electrification of the fence should be considered.

### *Vehicle Gates*

With security fencing providing a controlled perimeter, gates can be installed to control access at entry points. Vehicle gates can be as straightforward as single- or double-swing, manually operated or electrically operated. There are a variety of types of electric gates, such as swing, track-mounted or cantilevered slide gates or vertical lift. When deciding on the type of gate, several factors should be considered. For instance: When considering the size of the gate opening, what types of vehicles will traverse the access point, and what will be the required turning clearance? For the clearance of the gate opening, is there sufficient room for the gate to open unobstructed or without creating an obstruction?

Weather can also affect the operation of the gate. In areas with heavy rainfalls, cantilevered gate rollers can slip and, therefore, a track-mounted, chain-operated gate may be a better choice. Areas with heavy snowfalls may wish to consider a vertical lift gate. If a gate is going to be installed at an unpaved access point, trenching and pouring concrete under the gate can control digging under the gate. This is especially desirable when wildlife fencing is installed. If tailgating through the gate is anticipated to be a problem, penalty boxes may be considered. A penalty box comprises any additional installation that prevents a vehicle from continuing on its desired route until the electric gate has closed behind it. Penalty boxes can increase the cost of the gate installation and may affect the type of gate installation.

### *Security Technology*

Ranging from the very simple to the very complex, a wide variety of measures can provide access to the airfield at access points, such as vehicle or pedestrian gates or doors. Padlocks are on the simple end of the spectrum and are cost effective. Padlocks can work well in areas where only limited access is required, such as construction gates or access points for use only by airport personnel. While inexpensive, padlocks are inefficient where numerous persons require access, because either airport personnel are continually locking and unlocking the access point or numerous keys have to be made and issued to airport tenants. Keeping track of keys and prohibiting people from loaning them to others are almost impossible. However, smart keys have been helpful in securing low-volume access points that are padlocked and accessed by numerous approved personnel.

Keypads at the access point will provide an acceptable level of security in many cases, but for airports with a strict access policy, they may not provide the level desired. The primary challenge with keypads is that the codes can be given to anyone.

Another means of allowing gate access is remote control. Similar to a garage door opener, these remotes usually contain more code points than the typical garage opener. Remotes are available on the open market, and the codes can be copied and applied to the additional unit. Remote openers work well for off-airport first responders, where the remote can be kept in vehicles designated for response.

Badging (card reader) systems are on the upper level of the security spectrum and, unfortunately, the cost curve. Badging systems can be generic, where they are programed in advance to allow access through designated or all access points. More advanced badging systems require the airport operator to issue the cards, usually with a photograph of the card holder. These cards can allow access to all or specific access points. The more advanced types of these systems are programmable, using a chip or strip code that is specific to the card. The access point can be programmed at the gate or door through a laptop, or a computer in the airport office can be linked to the access reader via telephone lines or fiber-optic cable. Card reader systems can also provide a record of access.

Biometric readers are the most secure, because they are specific to the user. The biometric identifiers can be a fingerprint or an eye scan programmed at the site. Dual requirements through a combination of access controls may be the most secure method, because two forms of access identification are needed to activate the opener, and the user's biometric characteristics cannot be copied. The most widely used combination for dual access control is the airport-issued identification and a biometric.

Closed-circuit television (CCTV) is commonly used to provide a record of actions that occur at the airport. CCTV cameras can be used in a variety of areas such as at access points, in high-risk areas like fuel farms, on specific fence locations and at strategic points on the airport to monitor and record aircraft operations, including incidents. Camera types vary depending on the desired application. Fixed-mount cameras, as the name implies, are mounted and fixed at a desired location. Pan–tilt–zoom cameras are adjustable within the design capabilities of the camera. Adjustments of these cameras are made from a remote source, usually a computer. The more sophisticated models can also be viewed and sometimes adjusted through smartphone applications. Motion-activated cameras can be monitored at all times but will only record when motion is detected. Pan–tilt–zoom and fixed cameras can be purchased with motion activation. The camera's motion activation results in less storage space being required.

Video can be stored through the use of DVRs or in the cloud. Cloud storage has become relatively inexpensive and is virtually unlimited. Depending on the access control used for gates and storage requirement for the video, some method of connectivity will be needed. Connectivity can be accomplished through the use of telephone lines, the installation of fiber-optic cables or, in cases where the line of sight from the device to the storage unit or transmitter is unavailable, wireless applications.

## Establishing Accountability

Regardless of the level of security chosen for the airport, the security committee should consider enforcing the security program through accountability and a penalty program. The accountability element of the security program must be communicated to make sure all elements are known and that the program is fairly and equally administered.

Each person entrusted with any portion of the security program must be accountable for violations, such as failing to report lost or stolen identification cards and gate-access controls, loaning access-entry devices or identification cards to unauthorized persons, allowing

unauthorized access to any portion of the airport covered by the program, disabling or disarming security devices or failure to perform the assigned duties, as specified in the plan.

Penalties for violations of the program can be progressive, depending on the severity of the infraction, and could include charges for replacement of a lost or stolen identification card or gate-access controls; reimbursement for damage to any security device, including cameras, gates and access controls; and denial of access for a predetermined period, up to and including permanent.

## Other Security Requirements Applicable at Small Airports

Three of the 49 CFR 1500 series regulations apply to small airports without commercial service:

- Part 1550: Aircraft Security Under General Operating and Flight Rules, which applies to aircraft operations conducted in aircraft with a maximum takeoff weight of 12,500 pounds
- Part 1552: Flight Schools, which describes the procedures a flight school must follow before providing flight training
- Part 1562: Operations in the Washington, D.C., Metropolitan Area, which specifies regulations for the Maryland Three Program (three GA airports within the Washington, D.C.-restricted zone: College Park Airport, Potomac Airfield and Washington Executive Airpark/Hyde Field) and special requirements for GA aircraft wishing to use Ronald Reagan Washington National Airport

While the managers of small airports may not be directly responsible for implementing these regulations, the managers should be aware of the regulations.

## 4.6 Staff Training

### Key Insights

*Regardless of the airport size, all personnel operating at an airport should be trained to understand the airport environment. The level of training should fit the complexity of the airport.*

*Operation and maintenance of the airport in a safe and efficient manner is critical to the success of the airport organization, because it:*

- *Reduces the airport's capital requirements by finding and correcting deficiencies before they become failures.*
- *Reduces the airport's liability in case of an incident.*
- *Can reduce the airport insurance costs through a credit for a properly operated and maintained airport.*

### Key Definitions

**Aircraft operations area or air operations area (AOA)**: Any area of an airport used or intended to be used for landing, takeoff or surface maneuvering of aircraft, including runways, taxiways and, in some cases, ramp areas.

**Federal Aviation Regulation (FAR) Part 139: Certification of Airports**: Federal regulations that pertain to airports that agree to meet certain operational and safety standards as prescribed in 14 CFR Part 139, also referred to as FAR Part 139, to accommodate scheduled and unscheduled air carrier aircraft and that are issued an operating certificate by the FAA.

**Foreign object damage and foreign object debris (FOD)**: Foreign object debris is a substance, debris or article alien to an aircraft or aircraft system that could potentially damage the aircraft. Foreign object damage is any damage attributed to a foreign object that can be expressed in physical or economic terms and may or may not degrade the aircraft's required safety or performance characteristics.

**Runway holding position (hold line)**: The purpose of holding-position markings are to prevent aircraft and vehicles from entering critical areas associated with a runway or navigational aids or to control traffic at the intersection of taxiways.

**Runway incursion**: A top FAA safety concern, runway incursions are defined by the FAA as "any occurrence at an aerodrome involving the incorrect presence of an aircraft, vehicle or person on the protected area of a surface designated for the landing and takeoff of aircraft." Runway incursions can be caused by pilot deviations, air traffic controller operational incidents and ground vehicle deviations.

### Establishing a Training Program

Establishing a staff training program is crucial to the effective and safe operation of the airport and in preventing injury to people or damage to property. Regardless of the airport's size, all personnel operating at an airport should be trained so they understand the specific requirements and operating procedures of the aviation environment. The staff training program should be established to align with the complexity of your airport. At a small airport without an ATCT, everyone operating at an airport should understand how pilots communicate, where to look for landing aircraft based on winds and how to avoid creating a runway incursion. At larger airports,

this training will include communicating with air traffic control and more detailed information on movement and nonmovement areas, among other topics. As detailed in *ACRP Synthesis 49: Helping New Maintenance Hires Adapt to the Airport Operating Environment*, the most common training program for small airports is on-the-job training conducted by the airport manager. To assist the manager in the training, several training tools are provided in *ACRP WebResource 6*.

### *Personnel*

Personnel are the most important part of any staffing and training program. The airport sponsor (owner) needs a sufficient number of qualified personnel to ensure that the airport's self-inspection and maintenance programs can be performed on a basis consistent with the schedules established for the airport. These personnel also must be equipped with the resources necessary to carry out their assigned functions. This equipment ranges from the vehicles used to access the inspection areas, to the tools needed to conduct preventive maintenance and minor repairs, to the replacement parts required.

All personnel who access movement areas and safety areas and perform duties on the airfield must be properly trained to safely and effectively perform their duties without creating a safety hazard to themselves or the flying public. There are a number of components that should be part of a comprehensive training program. Key areas are described in the following sections.

## Comprehensive Training Topics

### *Self-Inspection Programs*

Each airport, regardless of size and operational counts, should establish a self-inspection program. Although the FAA only requires a self-inspection program for Part 139 airports, many states have established procedures for inspections at airports and a time frame for those inspections. It is strongly recommended that all airports adopt an inspection checklist similar to the Part 139 inspection checklist, as included in *ACRP WebResource 6*, that is comprehensive and, in almost all cases, will exceed the state requirements. While not required at many small airports, the Part 139 inspection checklist provides a comprehensive starting point that can be adapted to fit your airport.

### *Driver Training*

Runway incursions are one of the FAA's "hot button" issues. To reduce the likelihood of a runway incursion and to promote a safe operating environment for aircraft, a comprehensive driver training program should be developed for the airport, or commercially available training should be used. The training should include, at a minimum:

- **Purpose of the training program**: An explanation of why driver training is required. Airport driver training programs are intended to prepare employees for operating safely on the airport's surface. Reasons for the training include risk and liability reduction and reducing the likelihood of an incident resulting in property loss, injury or death.
- **Vehicle requirements for operating on the airport**: Minimum requirements for any vehicle operating on the airport include operating headlights, operating taillights, rotating or flashing yellow beacon, two-way aircraft transceiver and a properly inspected fire extinguisher.
- **Airport familiarization**: This should include, at a minimum, a visual of the airport delineating the runways, taxiways, ramp or

For airports operating with a UNICOM, the best practice for vehicle operations prior to entering the AOA should be as follows:

- Announce intentions on UNICOM (specify correct frequency)
- Wait for reply
- Visually check for aircraft in the traffic pattern or on approach
- Announce intentions a second time
- If no reply, proceed onto the AOA
- Continue to monitor UNICOM and maintain visual surveillance for aircraft

apron areas, lighting systems, electrical vault location, safety areas and communication requirements. At most small airports, UNICOM (universal communications), which is an air–ground communication facility operated by an entity that is not air traffic control, is used to provide advisory service at uncontrolled airports. The same frequency is also used by pilots for communications between aircraft at the airport as the primary means of communications.

- **Phonetic alphabet**: The phonetic alphabet is a list of words that are used in aviation with the intent to reduce the possibility of a misunderstanding. As an example, Taxiway A would be announced over the UNICOM as Taxiway Alpha.
- **Safety while driving on the airport**: The safety considerations for operating a vehicle in an airport environment are numerous and include reviewing the airfield diagram on a regular basis, using access roads when available, being familiar with signage and markings, always being aware of the operating environment and avoiding distracted driving.
- **Practical experience**: Upon completion of the driver training presentation, each trainee at an airport with an ATCT should operate at the airport with an experienced driver, until the trainer feels that the trainee is comfortable operating at the airport and communicating with ATCT. Airports with operating ATCT should conduct the training with minor modifications to the UNICOM requirements. A visit to the ATCT facility should also be scheduled to provide an extra layer of understanding for those operations. For airports without an operating ATCT, the level of practical experience should be designed to meet the level of complexity of the airport and the availability of staff.

The presentation Airport Drivers Training, available in *ACRP WebResource 6*, can be customized for individual airports. *ACRP Report 101: Best Practices Manual for Working in or near Airport Movement Areas* offers a database of best practices, training tools and aids. There also is a video, "Staying Safe on the Airfield," to introduce new staff to the airport driving environment.

**AVIATION PHONETIC ALPHABET**

A – Alpha
B – Bravo
C – Charlie
D – Delta
E – Echo
F – Foxtrot
G – Golf
H – Hotel
I – India
J – Juliet
K – Kilo
L – Lima
M – Mike
N – November
O – Oscar
P – Papa
Q – Quebec
R – Romeo
S – Sierra
T – Tango
U – Uniform
V – Victor
W – Whiskey
X – X-ray
Y – Yankee
Z – Zulu

### *Driver Training of ARFF Personnel or Police*

Most city or county police and fire departments have little or no experience driving in the airport environment. When responding to an emergency at the airport, their first thought is to get to the scene as soon as possible. This may lead to those responders creating an unsafe condition by crossing active runways or taxiways. An important part of emergency planning is familiarizing first responders with the airport.

Therefore, all first responders with the responsibility of responding to airport incidents or accidents should attend the airport's driver training course.

### *Airport Condition Reporting*

Any situation that has the potential to create a hazardous operating condition at the airport should be reported via the FAA's Notice to Airmen (NOTAM) system. A hazardous condition could be any discrepancy noted in the airfield self-inspection or an off-airport condition, such as an obstruction in the approach. A consistent presence of wildlife, such as flocking birds, would also be a hazard. Reporting a known hazardous operating condition appropriately via a NOTAM is important to managing the liability of the airport sponsor. Therefore, it is important that staff responsible for issuing NOTAMs are appropriately training on the system used by the airport. The FAA is encouraging that all NOTAMs be filed electronically.

### *Airport Advisories*

At nontowered airports, staff may provide advisories to pilots regarding wind, traffic and runways in use. *ACRP Synthesis 75: Airport Advisories at Nontowered Airports* provides a summary and case studies of practices used at nontowered airports with at least 50,000 annual operations.

### *Preventive Maintenance Program*

Preventive maintenance is designed to identify and correct deficiencies before failures occur, thus preventing costly repairs or replacements. A preventative maintenance program can and should be established in small increments, starting with the most critical infrastructure or facilities and ending with the least critical. A preventive maintenance program is an important part of asset management by extending the useful life of existing assets.

### *Wildlife Hazard Management*

As identified in FAA Advisory Circular 150/5200-32: Reporting Aircraft Wildlife Strikes, each year in the United States, wildlife strikes to U.S. civil aircraft cause $718 million in damage to aircraft and about 567,000 hours of civil aircraft downtime. The FAA maintains a comprehensive program to address wildlife hazards, with valuable information on the Wildlife Hazard Mitigation page of its website. Wildlife can, in almost every case, present a risk that can cause damage ranging from minor to complete loss and bodily injury of a minor to critical nature, or even death. Staff should be trained on the identification and elimination of wildlife attractants in order to substantially reduce this risk. Chapter 7 of *ACRP Report 32: Guidebook for Addressing Aircraft/Wildlife Hazards at General Aviation Airports* provides guidance about wildlife hazard management training for GA personnel. Section 4.9: Wildlife Management of this document addresses wildlife management in more detail.

### *Basic First Aid and CPR*

Basic first aid and CPR training for airport staff can be very important to provide assistance to injured persons prior to the arrival of fire, rescue and emergency medical technician (EMT) or paramedic personnel, especially when those personnel are not located at the airport. The prompt response to an emergency is invaluable, in many cases, to reducing the severity of the injury or preventing death. There are several nonprofit organizations (American Heart Association, American Red Cross, etc.) that can provide basic first aid and CPR training on a low- or no-cost basis.

### *Handling and Storing of Hazardous Substances and Materials*

A hazardous material is any item or agent, including biologic, chemical, radiologic or physical, that has the potential to cause harm to humans, animals or the environment. Harm may be caused either by the agent or item or through interaction with outside factors. Many agents have the potential to cause harm at various levels by themselves and through outside factors. For example, fuels can cause skin irritation, eye damage and respiratory issues. When fuel is combined with the outside factor of fire, it presents another level of harm.

Hazardous materials that may be found at airports include, but are not limited to, aviation and vehicle fuels, paints, antifreeze, deicers and herbicides. Material safety data sheets (MSDS) are available from the manufacturers of most hazardous materials. If the MSDS are not included with the shipment of the chemical, they may be obtained from the manufacturer or located on its website. Hazardous materials handling and storage training can be found at the Occupational Safety and Health Administration Chemical Hazards and Toxic Substances web page or through the Institute of Hazardous Materials Management website.

### *Ramp/Apron Safety*

While apron safety is important at all airports, at airports with commercial service passenger operations, there are additional types of vehicles on the apron to service the aircraft. Also, at smaller commercial service airports, passengers may access the apron to board the aircraft. *ACRP Synthesis 29: Ramp Safety Practices* identifies current ground handling practices, safety measures and training.

## Professional Development and Continuing Education

Regardless of how comprehensive the airport's training program is, no program can be truly successful unless the training is continuous. At small airports with fewer training opportunities, outside opportunities should be sought for continued professional development and to stay current on industry issues and trends.

Opportunities for an employee's professional development can come from attendance at state, national and association aviation conferences and taking related coursework at a local community college, online or both. Some conferences offer recognized continuing education credits for attendance at sessions. Joining local chambers of commerce or service clubs (National Exchange Club, Kiwanis International, Lions Clubs International, etc.) helps get the word out about the airport as well as provides the opportunity to learn more about the area around the airport and the community the airport serves.

ACRP offers periodic webinars based on completed research projects. You can subscribe to the TRB's electronic newsletter (http://www.trb.org/Publications/PubsTRBENewsletter.aspx) to be notified about upcoming webinars. Also, some past ACRP webinars have been recorded. If a project has an available webinar, it is identified on the home page for the study products. ACRP webinars have typically been free for attendees.

There are also training programs available through state, federal and association programs, as discussed in *ACRP Synthesis 18: Aviation Workforce Development Practices*. Which training program works best for your airport will depend on the type and level of training required. *ACRP Report 75: Airport Leadership Development Program* can help existing and future airport leaders assess, obtain and refine airport-industry leadership skills. Most training can be located by an internet search for the desired training topic or content.

The Airports Council International (ACI) and the American Association of Airport Executives (AAAE) offer accreditation programs. ACI's accreditation is a joint effort with ICAO and geared toward larger international airports. Generally, smaller airports are more involved with AAAE, so it can be a better fit for small airport managers. AAAE has two levels of accreditation. Certified member (C.M.) is open to any member of AAAE. To obtain C.M. credentials, the candidate studies the materials provided as part of registering for the program and must pass a 180-question, multiple-choice test about the material. The second level of accreditation, accredited airport executive (AAE), is only open to persons working in airport management at an airport. The first step toward the AAE accreditation is the C.M. accreditation. A candidate must have at least 1 year of full-time work experience at a public-use airport and a 4-year college degree or 8 years of airport civil management experience to start the AAE accreditation program. The candidate must complete a research paper, case study, proctored exam or advanced degree, and pass an oral exam with a panel of AAEs. The candidate must have at least 3 years of full-time management experience at a public-use airport prior to the oral exam. Managers at small airports that pursue the AAE accreditation may find it helpful to have a mentor at a larger airport with commercial service to provide exposure to larger airport operations.

In addition to its accreditation program, AAAE offers other training opportunities. The Airport Certified Employee (ACE) programs cover airfield operations, airfield lighting maintenance, security, communications and airport trusted agent. These programs are designed to provide up-to-date certification within these areas. AAE, C.M. and ACE are recognized credentials within airport management. AAAE and the Aircraft Rescue Firefighting Working Group, collectively known as the ARFF Training Alliance, offer the Airport Master Firefighter and Airport Fire Officer programs. These are designed to enhance the knowledge of aircraft rescue firefighters, regardless of rank, and are self-study programs structured to provide ARFF personnel with an enhanced knowledge of ARFF operations as well as airport operations and administration. Some airlines

offer free aircraft familiarization tools. One such tool is the American Airlines ARFF Guide for iPad or eReader made available to familiarize responders with the aircraft that American Airlines flies. Reach out to airlines that serve the airport to see what training resources may be available.

AAAE also offers an online Airport Security Coordinator Certification (ASC) program. Title 49 CFR Part 1542 requires that an airport security coordinator and a designated alternate attend ASC training (TSR 1542.3). This program is one way to fulfill that requirement. Additional information on all AAAE training and certification programs can be found on the AAAE website.

The Airport Consultants Council (ACC) is another association that offers conferences and webinars to further one's aviation knowledge. Many of the aviation associations also publish magazines. The articles provide an opportunity to read about current issues and how airports have approached the issues. Additionally a number of nonassociation industry magazines are free to airport managers and can be found by doing a web search on airport or aviation magazines. Some of the publishers also have free daily news briefs to which an airport manager can subscribe.

### *Record Keeping*

A detailed record of training should be created and retained for each person receiving training. At a minimum, the type of training received, the date of the training and the date a refresher, or retraining, is due should be documented. Record-keeping requirements are discussed in more detail in Section 4.8: Record Keeping.

## 4.7 Equipment Management

### Key Insights

*At small airports, maintaining equipment is essential, because funding new equipment is a challenge.*

*Snow removal equipment is eligible for FAA Airport Improvement Program funding, and aircraft rescue and firefighting equipment is eligible for Airport Improvement Program funding at Part 139 airports. Maintenance equipment is never Airport Improvement Program grant eligible.*

### Key Definitions

**Aircraft rescue and firefighting (ARFF)**: A special category of firefighting that involves the response, hazard mitigation, evacuation and rescue of passengers and crew of an aircraft involved in an airport ground emergency.

**Equipment maintenance**: A broad term used to describe the various processes that are used to keep equipment in proper working order.

**Equipment maintenance management program (EMMP)**: A systematic approach to keeping equipment in proper working order.

**Snow removal equipment (SRE)**: Equipment, typically trucks and tractors, used at an airport to remove snow.

### Establishing an Equipment Maintenance Management Program

The idea behind any maintenance program is to ensure that the items being maintained are in compliance with any safety regulations that may apply, as well as remain capable of producing the desired output. Developing and adhering to a maintenance program will reduce capital expenditures for new equipment by extending the useful life of existing equipment. An EMMP is a systematic approach to addressing routine and more extensive maintenance and, ultimately, the replacement of equipment. An EMMP is part of an overall plan to manage existing assets, as addressed in Section 5.1.

#### *Equipment Maintenance*

The steps used in any equipment maintenance plan will vary, depending on the type of equipment involved. In some cases, the maintenance schedule is simple and may require nothing more than periodic checks of filters or other removable components, coupled with more comprehensive checks of key components at specific points throughout the year. At other times, the maintenance process may require daily inspection of certain components as a means of identifying potential issues so that equipment downtime will not represent any serious impact on productivity.

Records of inspections and component replacements should be created and maintained. These records will provide information on the intervals of parts replacement and the associated costs. These records are valuable in budgeting for the parts and supplies needed for the maintenance program and will help develop equipment replacement schedules.

The inspections and servicing of vehicles should be scheduled during periods of inactivity, when possible.

- ARFF equipment should be inspected and serviced during times when air carriers are not scheduled for operations. Preferably, the inspections should occur before the first operations

of the day. If more than one ARFF vehicle is available at the airport, only one vehicle at a time should be removed from service for inspection or maintenance. Taking any ARFF vehicles offline for an extended period of time should be done only after a careful consideration of potential impacts to the airport certification index.
- SRE should be thoroughly inspected after the last event of the season, but no later than prior to the first snow event, and at intervals between snow events. This may result in the equipment being inspected more often but will help prevent failures during times of need. Inspecting the equipment as soon as possible before the first event will assist in obtaining replacement parts that may be required before the equipment is needed.

### *Equipment Replacement*

Equipment purchases must be planned, because equipment has a major budget impact on most small airports. The development of an EMMP will help determine when these purchases will be required and will assist in making budget decisions. Maintaining good EMMP records will help estimate the life of equipment by monitoring changes in maintenance requirements.

Even when a piece of equipment is still meeting its function, replacement of that equipment may be driven by parts that are no longer available. As equipment ages, it is possible that replacement parts may become unavailable, require longer-than-acceptable lead times to receive the part or require replacement more often than is financially feasible. Also, as more efficient equipment is developed, it may be cost effective to consider replacement.

## Equipment Grant Funding Eligibility

### *Snow Removal Equipment*

SRE is grant eligible. The amount and size of equipment must be evaluated for each airport. The FAA Minneapolis ADO has published guidance for justifying the purchase of SRE. To summarize that guidance:

- Generally, commercial service airports justify more SRE than GA airports.
- Areas with average annual snowfalls above 30 inches per year receive a higher priority than those with averages below 30 inches.
- More equipment is justified for airports with more activity.
- The number of runways, taxiways and apron areas that are critical for aircraft operations are used to justify SRE. Typically, crosswind runways and supporting taxiways are not considered critical and are not included for SRE justification. These areas are identified in the airport's snow and ice control plan.
- The larger the equipment is, the fewer pieces of equipment that are needed; therefore, fewer are justified.
- A request for SRE should include a description of the proposed equipment and estimated cost. If it is a replacement, an explanation for the replacement should be included, along with the planned disposition of the old vehicle.

### *Airport Rescue and Firefighting Equipment (Part 139 Airports Only)*


ARFF equipment generally carries a high priority when the need is properly justified. An FAA Part 139 inspector's recommendation is helpful in the justification and prioritization of replacing equipment or adding new ARFF equipment when the airport's index changes. An FAA guide for specifying ARFF equipment is located in FAA Advisory Circular 150/5220-10: Guide Specification for Aircraft Rescue and Fire Fighting (ARFF) Vehicles.

## Procurement Requirements and Options

New replacement equipment may be purchased through the public bid process. Specifications must be compiled and the bid advertised as regulations require. An entity may be able to "piggyback" (term used when a state has set bid prices that local governments can use for purchases) on a state procurement or the acquisition of an identical piece of equipment bid on and acquired by another governmental agency.

Used equipment may be acquired through online auctions for governmental entities. Military surplus equipment may also be acquired through the General Services Administration (GSA). The GSA provides an online guide to acquiring military surplus property. This equipment is generally free; however, the acquiring agency will be responsible for transporting the items from the donation site to the airport.

Used equipment may be acquired from within an interagency governmental entity, such as the public works department. Acquiring used or surplus property should be undertaken with great care to ensure the equipment is serviceable or can be made serviceable with minimal cost.

FAA Advisory Circular 150/5210-5: Painting, Marking and Lighting of Vehicles Used on an Airport provides guidance on the painting, marking and lighting of ground vehicles that will operate in an air operations area. The appropriate painting, marking and lighting allow a vehicle to be more conspicuous from the air and the ground.

During any equipment acquisition process, coordinate with the grant provision agency (federal, state, local) to ensure all grant assurances and procurement requirements are met.

## 4.8 Record Keeping

### Key Insights

*Acceptance of FAA grants has associated record-keeping responsibilities.*

*Record keeping for training and condition assessments is prescribed by the FAA for FAR Part 139-certificated airports, but good record keeping is a best practice for all small airports.*

### Key Definitions

**Airport Improvement Program (AIP)**: A program that provides financial grants to primarily public agencies for the planning and development of public-use airports that are included in the National Plan of Integrated Airport Systems.

**Airport sponsor**: Typically a public agency or tax-supported organization that is authorized to own and operate an airport, obtain funds and property interests, and be legally, financially and otherwise able to meet all applicable requirements of laws and regulations. Occasionally, it is a private entity.

**Disadvantaged Business Enterprise (DBE) Program**: A federal program developed to ensure qualified firms owned and controlled by minorities may take part in contracts supported with federal funds.

**Federal Aviation Regulation (FAR) Part 139: Certification of Airports**: Airports that agree to meet certain operational and safety standards as prescribed in 14 CFR Part 139, also referred to as FAR Part 139, to accommodate scheduled and unscheduled air carrier aircraft and that are issued an operating certificate by the FAA.

### Record Retention


Two types of records are required to be retained by FAR Part 139-certificated airports. The first is the retention of training, NOTAM issuance and cancellation, and inspection and correction records required by the FAA for Part 139 airports to be retained, as described in Section 4.16: Operating Certificate Compliance. The retention of these types of records as generated by other small airports is, regardless of size, a best management practice. Records of airfield inspections, fueling inspections, ARFF equipment and vehicles, airport operations vehicles and training can be invaluable if there are legal proceedings against airport sponsors and their staff. These records can also provide beneficial documentation for insurance companies, providing quotes for airport liability insurance.

The other type is the financial records that need to be maintained by any airport receiving FAA AIP grants. In addition, airports receiving state grants should be aware of the associated record-keeping requirements. Maintaining the associated financial records, aside from being a best practice, is necessary to receive grants and be prepared in the event of an audit. The FAA can conduct audits for grant-funded projects, but state financial agencies may also conduct audits of public entities that include publicly owned airports.

### Grant Records

By accepting an AIP grant agreement, an airport sponsor agrees to maintain pertinent project accounts and records that fully support all project transactions and fully disclose the disposition of all grant proceeds. Sponsors must maintain accounts and records in accordance with an accounting system that will facilitate an effective audit that conforms to the Single Audit Act of

1984 and Office of Management and Budget Circular A-133. Sponsors accept this obligation, as outlined in Grant Assurance 13: Accounting System, Audit and Record-Keeping Requirements, whenever they accept an AIP grant offer. This grant assurance requires airport sponsors to retain the required records and make them available to the secretary and comptroller of the United States or any of their duly authorized representatives for the purpose of conducting an audit and examination.

The grant records that need to be maintained fall into four categories: financial, procurement, administrative and project records. For details, see the sidebar.

## Grant Record Retention

Grant records shall be retained for a period of 3 years. Generally, this 3-year period commences on the date of the final reimbursement, as specified in 49 CFR §18.42(c). For situations such as potential litigation or audit investigation, the sponsor may be required to retain the grant records beyond the 3-year period. Also, because grant agreements impose obligations that extend beyond the 3-year time frame, the FAA strongly recommends sponsors indefinitely retain the grant agreement and documents directly related to the grant agreement (Exhibit "A" property map, certificate of title, etc.).

The record-keeping requirements for equipment and real property acquisitions also extend beyond the 3-year time frame. For equipment, the 3-year period for record retention commences on the day the equipment is disposed of or replaced, subject to FAA concurrence. For real property, the 3-year period commences on the day the land is formally transferred, as approved by the FAA.

## DBE Program Reporting

The U.S. DOT has a Disadvantaged Business Enterprise (DBE) Program for recipients of U.S. DOT federal financial assistance, which includes AIP grants. Therefore, the FAA has an Airport Disadvantaged Business Enterprise Program. Airport sponsors must establish an overall DBE participation goal covering a 3-year fiscal period, if anticipating awarding FAA-funded prime contracts with a cumulative total value that exceeds $250,000 during any one or more of the fiscal years within the 3-year goal period. The airport sponsors are also required to annually submit the Uniform Report of DBE Commitments/Awards and Payments associated with contract award during that fiscal year. These reports are due December 1 for the prior fiscal year. The DBE Office Online Reporting System is used for the reporting.

## FAA Form 5010

An airport must ensure its FAA Form 5010: Airport Master Record is up to date. An airport can find its published 5010 data at Airport IQ™ 5010, which is maintained by a contractor to the FAA. The FAA Form 5010 is used to collect physical and operational information about an airport that is maintained on file with the FAA. Updates to Form 5010 commonly occur through the airport inspection process. Prior to an inspection, the airport operator should review the form and make note of any items that need to be updated. These updates should be passed on to the FAA in order for the records to be brought up to date. Between inspections, updates to the Form 5010 may also be necessary. For changes to the airfield, such as changes in runway length, an FAA Form 7480 must be filed. Other changes, especially temporary changes, are issued through NOTAMs. The entity that conducts the airport inspection can be contacted with other updates, such as obstructions that have been removed.

### RECORDS TO KEEP

**FINANCIAL RECORDS**
- Invoices and billing statements
- Vouchers
- Canceled checks
- Receipts
- Final contractor payment request

**PROCUREMENT RECORDS**
- Professional services contract
- Selection documentation
- Construction contract and associated documents
- Rationalefor contract type
- Basis for contract price (cost and price analysis)
- Purchase orders (if applicable)
- Contract instruments (change orders, notice to proceed, etc.)
- Record of negotiations
- Audit certification of consultant overhead rates

**ADMINSTRATIVE RECORDS**
- Grant agreement and amendments
- Sponsor certifications
- Project application
- Title VI certification (nondiscrimination)
- Drug-free workplace certification
- Exhibit "A" property map
- Certification of title (real property)
- Sponsor correspondence letters

**PROJECT RECORDS**
- Final project report
- Record drawings
- Buy American documentation
- DBE documentation
- Summary of test results
- Daily records and reports of construction
- Final inspection report
- Summary of pay factor applications

Source: FAA Central Region Airport Obligations: Record Keeping, accessed July 3, 2017.

## 4.9 Wildlife Management

### Key Insights

*Airports are required to address airport hazards, including wildlife, by a number of regulations and federal and state obligations. They may be required to conduct a wildlife hazard assessment and generally need to develop a wildlife management plan to address identified hazards.*

*Habitat management techniques will vary greatly from environment to environment but may include airfield turf selection and upkeep; landscaping and agriculture management; improvements to airport structures to minimize perching, nesting or denning behaviors; and stormwater resource management.*

*Be sure that all appropriate state and local permits are obtained for any taking (capture and release, or killing) of wildlife.*

### Key Definitions

**Hazardous wildlife**: Any species of wildlife, both feral animals and domesticated animals not under control, that are associated with aircraft strike problems, are capable of causing structural damage to airport facilities or act as attractants to other wildlife that pose a strike hazard.

**Wildlife attractants**: Any human-made structure, land-use practice or human-made or natural geographic feature that can attract or sustain hazardous wildlife within the landing or departure airspace, apron areas or aircraft parking areas of an airport.

**Wildlife hazard assessment (WHA)**: An evaluation of wildlife-related attractants and potential hazards to aircraft operations, often mandated by the FAA following a hazardous event or new potential threat.

**Wildlife hazard management plan (WHMP)**: A document that identifies measures to alleviate or eliminate wildlife hazards, as identified in a wildlife hazard assessment.

### Wildlife Hazards

Wildlife hazards present a substantial safety risk for aircraft operations. When left unaddressed, the hazards may result in tragic consequences on the airport that reach far beyond the fiscal impacts caused by a wildlife-related aircraft accident or incident. While many non-Part 139 airports are not required to conduct a WHA or develop a WHMP, consulting FAA Advisory Circular 150/5200-33: Hazardous Wildlife Attractants on or Near Airports is recommended because there may be low-cost measures the airport operator can implement to benefit users. The FAA also has available Wildlife Hazard Management at Airports: A Manual for Airport Personnel. *ACRP Legal Research Digest 20: Airport Responsibility for Wildlife Management* examines the issue from a legal perspective.

#### *Wildlife Hazard Assessment*

The first step in managing wildlife is to identify the species or wildlife attractants that are of concern to the airport, because a wide variety of mammal and bird species have been sighted on airports around the country. This assessment is accomplished by having a qualified wildlife biologist, with experience conducting airport assessments, perform a WHA. The FAA requires

operators of Part 139-certificated airports to conduct a WHA when these wildlife-triggering events occur:

- Multiple wildlife strikes are experienced by an air carrier.
- An air carrier aircraft sustains substantial damage from striking wildlife.
- An air carrier aircraft experiences an engine ingestion of wildlife.
- Wildlife of size and type capable of causing the events just described is observed to have access to the aircraft movement area or airport traffic pattern.

At a Part 139 airport, repeated wildlife strikes necessitate a WHA, as defined in FAR §139.337. Repeated wildlife strikes at a non-Part 139 airport may also necessitate a WHA. Even if a WHA is not requested by the FAA, small airport managers should consider conducting a WHA from a safety risk management (SRM) perspective if aircraft using their airport have experienced multiple wildlife strikes, substantial damage from a strike or wildlife engine ingestion.

When an airport operator wants a WHA for the airport, a qualified wildlife biologist must be retained to conduct the assessment. The biologist must meet the qualification standards set per FAA Advisory Circular 150/5200-36: Qualifications for Wildlife Biologist Conducting Wildlife Hazard Assessments and Training Curriculums for Airport Personnel Involved in Controlling Wildlife Hazards on Airports. These qualifications include meeting the credentials of a GS-0486 series wildlife biologist (as defined by the U.S. Office of Personnel Management) **or** being designated a certified wildlife biologist by The Wildlife Society, **and** having passed an airport wildlife hazard management training course accepted by the FAA **and** having conducted at least one WHA while working under the supervision of a qualified airport wildlife biologist.

A WHA may be initiated because of a triggering event. If there is a triggering event, the WHA will evaluate what caused the event and when and where it happened so immediate corrective action can be taken. In addition, the WHA will include a yearlong assessment of wildlife activity at and around the airport. The WHA examines the nature of wildlife species that have access to the airport, including their seasonal or movement patterns and protection statuses. It also identifies and evaluates the location of features that attract wildlife. Each of the species should be evaluated by the biologist for the degree of hazard presented to aircraft. The analysis must include a prioritized list of recommendations to address the hazards through the mitigation of wildlife attractants. More information on WHA development and requirements is contained in Chapter 5 of *ACRP Report 32: Guidebook for Addressing Aircraft/Wildlife Hazards at General Aviation Airports*.

### *Wildlife Hazard Management Plan*

Based upon the findings of the WHA, an airport may be required to prepare a WHMP to manage the wildlife hazards identified in the assessment. At a Part 139 airport, the WHMP must be prepared to meet the requirements of FAR §139.337.

The WHMP identifies personnel responsible for plan implementation, identifies and describes wildlife attractants at or near the airport, identifies appropriate wildlife management techniques and prioritizes appropriate management measures, such as habitat modification and land-use changes. The plan must also recommend necessary equipment and supplies. In addition, it establishes training requirements for identified personnel, as well as the WHMP review and update procedures. Because plan implementation is contingent on the commitment of airport resources to hazard management strategies, the interests of airport stakeholders must be considered part of the process. If federally listed or proposed endangered or threatened species or critical habitats are present on the airport preparing a WHMP, a biological assessment must be prepared and submitted along with the draft plan to the FAA for review and approval.

## Wildlife Strikes

All strikes at all airports, regardless of the measure of aircraft damage (or lack thereof), should be recorded. Strike records should then be correlated to types of species that have caused the strike and severity (actual or potential) of strike damage. Airport operators should be aware that the number of reported strikes is likely to increase after the initial implementation of the WHMP because of program implementation and increased wildlife education and awareness of airport staff and users. Wildlife strike records can be used within the framework of a safety management system (SMS) and for SRM purposes, as discussed in Section 4.11: Safety Management System of this guidebook. More information on SMS in wildlife hazard management can be found in *ACRP Report 145: Applying an SMS Approach to Wildlife Hazard Management*.

## Best Practices to Deter Wildlife or Implement Wildlife Management

In addition to the measures and methods identified as a part of the airport WHA or WHMP, airports are advised to evaluate and implement the best practices in habitat management, airport design and airport operational implementation in order to further reduce wildlife hazard impact potential. These strategies may include the following:

- Identifying, reducing or removing on-airport wildlife attractants, such as food sources and natural habitats
- Designing on-site wet stormwater ponds in accordance with FAA guidance to reduce attraction of wading birds
- Installing wildlife management fencing
- Identifying and managing mowing height to deter wildlife
- Seeking to control, by the means of land use and zoning measures, the location of wildlife attractants, such as sanitary landfills or transfer stations that handle putrescible waste
- Conducting regular fence checks and removing any animal carcasses off airport property to deter scavengers
- Engaging with the airport's U.S. Department of Agriculture Animal and Plant Health Inspection Service office to obtain valuable expert technical assistance for wildlife management

Federal funding may be available to implement some of the best practices for wildlife hazard management; however, in certain cases (such as funding for wildlife fencing), the FAA requires a wildlife management plan to be in place. Additional ACRP research to assist airports with wildlife management is available in the following:

- *ACRP Synthesis 23: Bird Harassment, Repellent and Deterrent Techniques for Use on and near Airports*
- *ACRP Synthesis 39: Airport Wildlife Population Management*
- *ACRP Synthesis 52: Habitat Management to Deter Wildlife at Airports*

Wildlife management needs to be an ongoing process. In addition to birds and mammals, insects can also be an issue, especially for the staff maintaining the airport. In the south, fire ants are attracted to electrical systems. Wasps can also be attracted to electrical equipment, especially the housing, and bees that build nests in the ground can be found near equipment and buildings. While these insects generally do not pose a direct threat to aircraft, they can attract larger species that could have an impact on aircraft.

## 4.10 Airport Obstruction Management

### Key Insights

*The airspace around each facility and the critical obstruction surfaces that must be protected are unique to each facility, influenced by the facility design, operational procedures and instrument approach types.*

*While FAR Part 77 is the most prominent and familiar set of obstruction evaluation criteria, it serves only as the initial means of obstruction identification and evaluation. A final hazard determination will consider many additional factors and impacts on standards and criteria.*

*Local zoning can help enforce federal regulations that do not have any enforcement authority and provide practical protection for an airport and its airspace. Comprehensive local zoning ordinances for the protection of airport landing areas is a best practice.*

### Key Definitions

**Airspace hazard**: An airspace obstruction that has been studied and determined to have a substantial adverse effect, affecting a significant volume of aeronautical activity.

**Airspace obstruction**: An object, structure or element of terrain that exceeds federal obstruction standards, as defined in FAR Part 77.

**Substantial adverse aeronautical effect**: An impact on navigable airspace that necessitates a change to an instrument approach procedure, an approach minimum, or an element of an airport or a navigational aid, or a change in a vectoring altitude, so as to meet minimum procedure or facility design standards. The impact has to affect at least one daily operation (or a similar cumulative annual number of operations) in order to be considered significant.

**U.S. terminal instrument procedures (TERPS)**: Procedures for instrument approach and departure of aircraft to and from civil and military airports.

### Navigable Airspace Standards

U.S. Code Title 49 §40103 establishes and affirms that the United States government has exclusive sovereignty of airspace of the United States, and directs the administrator of the FAA to develop plans and policies for the use of navigable airspace. While recent court cases have attempted to challenge the aforementioned provisions of the law at altitudes below 500 feet, the FAA continues to analyze and issue determinations regarding the impacts that structures and vegetation have on the navigable airspace. This process is carried out with the goal of protecting people's safety in the air and on the ground, the operational safety of the nation's aviation facilities and the public investment therein.

While the FAA Obstruction Evaluation/Airport Airspace Analysis (OE/AAA) process examines the impacts of proposed or existing obstructions on navigable airspace and results in the FAA's issuance of hazard determinations for structures and vegetation, **the protection of airport airspace from encroachment is contingent upon local government authorities**. The FAA does not have, nor does it exercise, a local enforcement authority. While the FAA will work to ensure aviation safety through all available means, such as the cancellation of an approach, an increase in minimums, a runway threshold displacement or procedure limitations, only the local government zoning entities possess leverage to enforce height or use limitations within their jurisdictional limits. Airspace protection by the federal government is not wholly possible without coordinated

and vested collaboration between the FAA, the airport sponsors, the airport users and the local communities.

## Obstruction Evaluation

The FAA Air Traffic Organization utilizes the expertise of the FAA obstruction evaluation specialists and technicians to determine the nature and magnitude of airspace impacts by natural or man-made objects on navigable airspace. Off-airport analysis is accomplished through the FAA OE/AAA process, under the auspices of 14 CFR Part 77: Safe, Efficient Use and Preservation of the Navigable Airspace, also referred to as FAR Part 77. FAA Standard Operating Procedure 9: FAA Aeronautical Study, Coordination and Evaluation establishes the process for these airspace studies. The purpose of the process is to examine those objects that exceed the Part 77 notice criteria, establish whether the objects exceed any of the imaginary surfaces prescribed by Part 77 and determine whether the objects cause a substantial adverse impact that affects a significant volume of aeronautical activity. *ACRP Report 38: Understanding Airspace, Objects and Their Effects on Airports* contains a broad range of valuable information and resources related to Part 77 and the FAA evaluation process.

The criteria and the actual imaginary surfaces identified in Part 77 serve as an initial means to identify potential adverse impacts on navigable airspace and establish the potential presence or absence of an adverse aeronautical effect. These criteria, contained in FAR §77.17: Obstruction Standards include objects and traverse ways as follows:

(a) An existing object, including a mobile object, is, and a future object would be, an obstruction to air navigation if it is of greater height than any of the following heights or surfaces:
  (1) A height of 499 feet AGL [above ground level] at the site of the object.
  (2) A height that is 200 feet AGL, or above the established airport elevation, whichever is higher, within 3 nautical miles of the established reference point of an airport, excluding heliports, with its longest runway more than 3,200 feet in actual length, and that height increases in the proportion of 100 feet for each additional nautical mile from the airport up to a maximum of 499 feet.
  (3) A height within a terminal obstacle clearance area, including an initial approach segment, a departure area, and a circling approach area, which would result in the vertical distance between any point on the object and an established minimum instrument flight altitude within that area or segment to be less than the required obstacle clearance.
  (4) A height within an en route obstacle clearance area, including turn and termination areas, of a Federal Airway or approved off-airway route, that would increase the minimum obstacle clearance altitude.
  (5) The surface of a takeoff and landing area of an airport or any imaginary surface established under [FAR] §77.19, §77.21, or §77.23. However, no part of the takeoff or landing area itself will be considered an obstruction.

(b) Except for traverse ways on or near an airport with an operative ground traffic control service furnished by an airport traffic control tower or by the airport management and coordinated with the air traffic control service, the standards of paragraph (a) of this section apply to traverse ways used or to be used for the passage of mobile objects only after the heights of these traverse ways are increased by:
  (1) 17 feet for an Interstate Highway that is part of the National System of Military and Interstate Highways where overcrossings are designed for a minimum of 17 feet vertical distance.
  (2) 15 feet for any other public roadway.
  (3) 10 feet or the height of the highest mobile object that would normally traverse the road, whichever is greater, for a private road.
  (4) 23 feet for a railroad.
  (5) For a waterway or any other traverse way not previously mentioned, an amount equal to the height of the highest mobile object that would normally traverse it.

## FAR Part 77 Surfaces

The surfaces outlined in FAR §77.19, §77.21 or §77.23 include the following:

- **Primary surface**: A surface longitudinally centered on a runway. When the runway has a specially prepared hard surface, the primary surface extends 200 feet beyond each end of

that runway; but when the runway has no specially prepared hard surface, the primary surface ends at each end of that runway. The elevation of any point on the primary surface is the same as the elevation of the nearest point on the runway centerline. The surface width varies from 250 feet to 1,000 feet, based on the runway category and approach type.

- **Approach surface**: A surface longitudinally centered on the extended runway centerline and extending outward and upward from each end of the primary surface. An approach surface is applied to each end of each runway based on the type of approach available or planned for that runway end.
- **Transitional surface**: Surfaces that extend outward and upward at right angles to the runway centerline, and the runway centerline is extended at a slope of 7 to 1 from the sides of the primary surface and from the sides of the approach surfaces. Transitional surfaces for those portions of the precision approach surface, which project through and beyond the limits of the conical surface, extend a distance of 5,000 feet measured horizontally from the edge of the approach surface and at right angles to the runway centerline.
- **Horizontal surface**: A horizontal plane 150 feet above the established airport elevation, the perimeter of which is constructed by swinging arcs of a specified radii from the center of each end of the primary surface of each runway of each airport and connecting the adjacent arcs by lines tangent to those arcs. The radii of the arcs are 5,000 or 10,000 feet, depending on runway category or approach type.
- **Conical surface**: A surface extending outward and upward from the periphery of the horizontal surface at a slope of 20 to 1 for a horizontal distance of 4,000 feet.

The complex geometrical shape that combines the various imaginary surfaces is unique to each airport. A sample graphic of surfaces is shown in Figure 9. It is recommended that an airport sponsor develop and keep current a graphic of airport-specific imaginary surfaces for the purposes of communicating obstruction management concerns to elected officials, zoning and planning officials, and members of the public.

The standards contained in Part 77 do not serve as the ultimate indicator of a particular object being a hazard to air navigation. These criteria serve as an indicator that further evaluation and review of an airport's aeronautical activities are needed to make a determination of an object's impact on air navigation. In the process of that evaluation, the FAA considers additional standards and criteria. Those criteria and critical surfaces—which include the airport design criteria defined by FAA Advisory Circular 150/5300-13: Airport Design, instrument approach procedure design criteria defined by FAA Order 8260.3D: United States Standard for Terminal Instrument Procedures (TERPS) and considerations of impacts on air navigation facilities—form the basis for the FAA's ultimate determination of an obstruction's impact on air navigation.

## Critical Airspace Surfaces and Their Impacts

FAA Order 8260.3D defines critical surfaces and criteria utilized to design instrument procedures at an airport. Because of the specifics of the approach procedure design based on facility conditions and critical aircraft, the precise dimensions of individual surfaces is unique to the facility and particular approach. The surfaces include the following:

- **Visual area surface**: The 20:1 visual area surface is defined within Section 3.3.2.c of the TERPS order. The surface has a vertical slope of 20:1, extending from the runway's threshold elevation to the decision altitude of the specific approach. It begins 200 feet prior to the runway threshold and is intended to protect aircraft during the last stages of an approach, which follows the transition from instruments to visual guidance. All objects that penetrate the surface must be lowered or lighted to allow pilots to maintain visual separation. If they cannot be lowered or lighted, the visibility minimums associated with the approach will likely be increased, or use of the procedure at night will likely be disallowed to maintain safety.

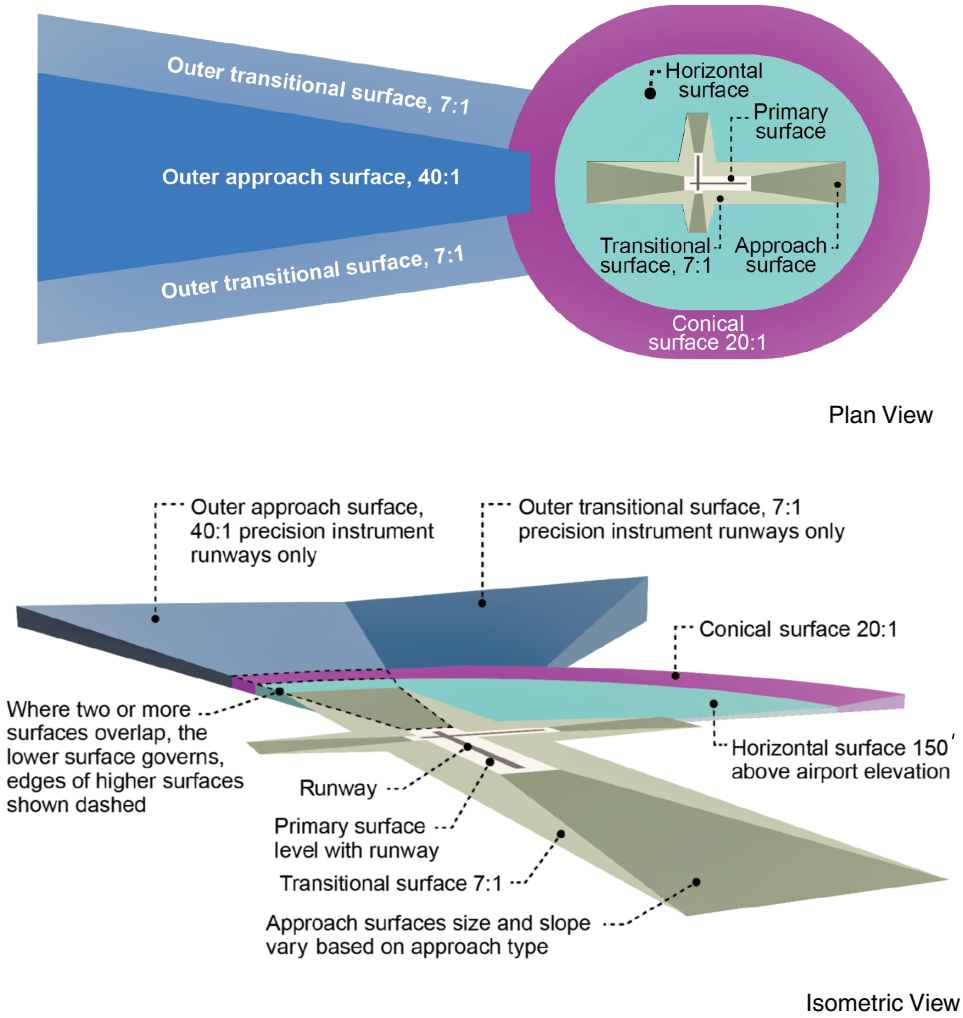



***Figure 9. FAR Part 77 surfaces.***

- **Final approach segment**: This is the segment of an approach procedure in which alignment and descent for landing are accomplished. The segment begins at the final approach fix and ends at the missed approach point or decision altitude, and the dimensional criteria/slope vary based on airport conditions and approach type. All objects that penetrate this segment must be lowered or removed; otherwise, the approach minimums will likely be increased, or the approach may be deactivated to maintain flight safety.
- **Missed approach segment**: The segment of the approach procedure, which protects the safety of aircraft executing a missed approach procedure. Although (like the final approach segment) the dimensional criteria for this surface will vary from procedure to procedure, the area considered for obstacles generally will have a width equal to that of the final approach segment at the missed approach (or decision altitude point) and will expand uniformly to the width of the initial approach segment at a point 15 nautical miles from the missed approach point.
- **Departure obstacle clearance surface**: A 40:1 surface originating at the location and elevation of the departure end of the runway, which is used to evaluate required climb performance from a particular departure runway end to the nearest (shortest distance) obstacle in the segment. Impacts to this surface may result in the addition of required climb gradient restrictions to the departure end of the runway.

The FAA Advisory Circular 150/5300-13 approach and departure design standards define the dimensions and slopes of the surfaces used to guide planning and development of the facility:

- **Vertical guidance surface (VGS), formerly referred to as the glide path qualification surface**: An imaginary 30:1 surface, applicable to precision approach or approaches with vertical guidance, extending from the runway threshold along the runway centerline to the decision altitude point. Impacts on the VGS may require nonstandard glide path angles or even approach discontinuation.
- **Threshold siting standards**: Runway threshold siting criteria, based on runway approach type and airplane design group. FAA design standards require the runway threshold to be positioned so that there are no obstacle penetrations to the appropriate approach surface. Impacts on the threshold siting surfaces may result in threshold displacements or the implementation of declared distances on the runway, reducing runway utility.

These standards generally align more closely with TERPS standards than FAR Part 77 to account for the new instrument approach capability using a global positioning system.

## Technical Resources Available to Airport Sponsors

While there are a number of proprietary or custom software solutions available for procurement by airport sponsors wishing to conduct airspace analysis and obstruction evaluations on the airport's behalf, the FAA offers a number of free resources that should be referenced and used regularly by the airport sponsors, managers or staff.

When an airport sets up an account for the FAA's Airport GIS website, the FAA Surface Analysis and Visualization Tool analyzes object penetrations to the visual area surface of instrument approaches using a risk-based approach. The tool allows the FAA and airport owners and sponsors to discover, verify and mitigate objects identified as penetrations to the 20:1 visual area surface. It assesses surface penetrations against the requirements of TERPS and FAA advisory circulars and evaluates the effects of existing and proposed object penetrations, based on Part 77. It is important to note that although the tool can be used to evaluate a majority of the visual surface areas for most straight-in approaches, it does not evaluate all possible conditions pertaining to certain visual segments of instrument approaches.

The FAA Notice Criteria Tool assists users in determining the applicability of Part 77 notice criteria to a specific object or structure. It utilizes the coordinates, site elevation and object height supplied by the user to establish whether a Form 7460-1: Notice of Proposed Construction or Alteration must be filed with the FAA Air Traffic Organization or FAA ADO.

Lastly, the FAA OE/AAA website contains a number of resources that allow airport sponsors and managers to search for proposed or existing obstructions within specified ranges of their facility, subscribe to alerts notifying them of proposals filed with the FAA and reference other resources related to obstruction marking and lighting, wind turbine installations, etc.

## Establishing a Proactive Obstruction Management Program

Proactive airport obstruction monitoring and mitigation serve to protect the safety and utility of the airport and its elements. The process will vary from airport to airport, based on state and local conditions and regulatory requirements. However, some of the basic steps and best practices remain the same. To establish and implement an effective obstruction management program, the following should be undertaken:

- Step out of your office. Be attentive to the development around your airport. Watch for new structures, cranes, lights, traffic signals and even landscaping that may affect your airport's airspace.

- At a minimum, conduct an annual review of existing instrument approaches. Do not be caught by surprise if a new approach changes the dimensions and criteria of critical surfaces applicable to your facility.
- Identify and utilize all available regulatory measures for obstruction mitigation or removal. The FAA relies on local zoning controls for obstruction management at the local government level. Determine if state airport protection zoning regulations exist, and work toward establishing local zoning to protect your airport approaches from encroachment.
- Identify the critical surfaces specific to your airport's airspace, i.e., where an impact would result in a substantial adverse effect. While Part 77 surfaces are generally sufficient for the majority of small airports, airports that have approaches with vertical guidance, are located in rapidly developing areas or have historically been subject to airspace encroachment should seek to base their obstruction management criteria on surfaces defined by threshold siting criteria and TERPS.
- Conduct a thorough obstruction survey and analysis, identifying all penetrations to the surfaces that would result in operational impacts, such as the loss of an approach procedure, increase in minimums or loss of night approaches. Following collection and analysis of obstruction survey data, promptly develop an action plan aimed at removing or reducing the height of all objects that penetrate the critical surfaces. This should be carried out to the maximum extent possible prior to the submittal of survey data to the FAA through Airports GIS, in order to avoid adverse impacts on the airport procedures.
- Create and implement a plan of vegetation removal or hazard mitigation, which is practicable and legally defensible. Create and implement a vegetation maintenance and growth management plan that addresses imminent impacts to critical airport surfaces. Use federal requirements and state and local regulations (if applicable) to create an obstacle action plan that establishes mitigation or removal actions for each structure or object penetrating a critical surface.
- Create and codify (through land use or zoning controls) a composite map of critical surfaces, supported by obstruction mitigation and removal requirements. Airports that have access to GIS resources should consider developing a composite map of surfaces, which combines all critical surfaces for the particular airport and allows airport staff to analyze existing or potential airspace impacts to the lowest, most critical surface at any given point around the facility.
- Educate your local planning and zoning officials. They can be the airport's first line of defense when a potential airspace obstruction is proposed.
- Create a set of offset critical surfaces to account for vegetation growth for the period of the next 6 to 10 years. As an addition to the composite map, a second map can be created with surface offsets, which can be used to carry out hypothetical analyses of vegetation growth over the next 6 to 10 years.

As previously mentioned, airport sponsors should verify the existence of airport protection zoning regulations at the state level and use those regulations to protect the facility. Depending on your state's regulatory framework, airport or airspace protection zoning may be available as an airspace obstruction prevention or mitigation measure. Airspace protection zoning may include the following:

- A requirement to notify the airport sponsor and the FAA of any proposed construction or alteration exceeding federal obstruction notice criteria
- A requirement that the tall-structure proponent submit Form 7460-1: Notice of Proposed Construction or Alteration to the FAA for review and airspace analysis
- A requirement that any tall structure that exceeds Part 77 standards undergoes local or state permitting or zoning variance process
- A requirement that all structures that exceed Part 77 standards be marked and lighted in accordance with FAA Advisory Circular 70/7460-1: Obstruction Marking and Lighting

- Vegetation removal and control regulations
- Provisions for the enforcement of said requirements, appellate and judicial process conditions, and available remedies

Coordinate the development and implementation of airport protection zoning regulations with your state DOT or aviation (or aeronautics) office and seek the implementation of local regulations through a stakeholder-driven process, with a focus on protecting the airport safety and public investment in transportation resources. More detailed information on matters related to airport land-use compatibility and airspace protection can be found in *ACRP Report 27: Enhancing Airport Land-Use Compatibility* and *ACRP Report 38*. Section 5.6: Land-Use Compatibility and Zoning includes information on airspace zoning ordinances.

Lastly, be mindful that obstruction management is the responsibility of the airport and its sponsor. It is also an obligation under the federal grant assurances. The airport is responsible for notifying the FAA of any obstruction data discrepancies or inconsistencies, reviewing the visual area impacts using the tools provided by the FAA and protecting the facility and airspace from encroachment. The bottom line is that if detrimental obstructions promulgate at your airport, the FAA will seek to maintain flight safety by changing operations at your airport, such as increasing minimums or discontinuing instrument approach procedures, requiring threshold displacements that will limit usable runway length, etc.

## 4.11 Safety Management System

### Key Insights

*The FAA's proposed rulemaking published July 12, 2016, would require a safety management system to be developed and implemented at any Part 139 small airport designated by U.S. Customs and Border Protection as a port of entry, including designated international airports, landing-rights airports or user-fee airports or a Part 139 airport with more than 10,000 annual operations (takeoffs and landings).*

*Per the proposed rule (which has not been finalized), airports that are required to develop a safety management system will have 24 months to implement a safety management system, with an implementation plan required within 12 months.*

*Since June 2001, FAA Airports staff have used the formal safety risk management component of safety analysis to support their approval decisions on airport planning, development and standards proposals.*

### Key Definitions

**Hazard**: A condition, object or activity with the potential to cause damage, loss or injury.

**Modification to standards (MOS)**: Any approved nonconformance to FAA standards to airport design, construction or equipment procurement. MOSs are issued by the FAA on a case-by-case basis while maintaining an acceptable level of safety.

**Risk**: The chance of loss or injury measured in terms of severity and probability.

**Safety management system (SMS)**: A top-down, organization-wide approach to managing safety risk and assuring the effectiveness of safety risk controls. It includes systematic procedures, practices and policies for managing safety risk.

**Safety risk assessment (SRA)**: Assessment of a system or component, often by a panel of system subject matter experts and stakeholders, to compare an achieved risk level with the tolerable risk level.

**Safety risk management (SRM)**: A standard set of processes to identify and document hazards, analyze and assess potential risks and develop appropriate mitigation strategies.

### Safety Management System

There are inherent risks associated with aviation and airports. The goal is to minimize the risk through the mitigation of hazards. The purpose of an SMS is to proactively, nonpunitively identify and address potential safety hazards, with a goal to eliminate or avoid accidents or incidents before they occur. It is a tool for an airport operator to translate concern for safety into actions to mitigate hazards and seek continual improvement. Per *ACRP Report 1: Safety Management Systems for Airports, Volume 1: Overview* and *Volume 2: Guidebook*, an SMS includes a management commitment to safety, proactive identification of hazards, actions taken to manage risks and an evaluation of safety actions. This management commitment is essential to the implementation of an SMS, because only through management commitment will there also be the necessary financial commitment. *ACRP Legal Research Digest 19: Legal Issues Related to Developing Safety Management Systems and Safety Risk Management at U.S. Airports* addresses the implementation of an SMS at airports from a legal perspective.

An SMS may benefit your airport by enabling lower insurance premiums. To identify if there is a benefit, contact your airport's insurer. In addition, a reduction in incidents is always a benefit.

There are four components, or pillars, of an SMS, as described in FAA Advisory Circular 150/5200-37: Introduction to Safety Management Systems for Airport Operators.

**Safety policy** defines the airport organization's approach to managing safety, including management's commitment to safety and the overall safety vision. The safety policy of an SMS should include the commitment of senior management to implement an SMS, a commitment to continual improvement, the encouragement of employees to report safety issues without fear of reprisal, a commitment to provide the necessary safety resources and a commitment to make safety the highest priority. Generally, it will also include the identification of an SMS champion, responsible for the SMS.

**SRM** is a systematic, explicit and comprehensive approach for managing risk at an airport. It is a formal process within an SMS that:

- Describes a system,
- Identifies the hazards,
- Determines the risk,
- Assesses and analyzes the risk and
- Treats the risk (mitigate, monitor and track).

*ACRP Report 131: A Guidebook for Safety Risk Management for Airports* provides guidance on using SRM in daily operations as well as conducting a safety risk assessment on a specific proposed action. *ACRP Synthesis 71: Airport Safety Risk Management Panel Activities and Outcomes* enhances *ACRP Report 131* with additional tools, templates and a quick reference guide.

**Safety assurance** is the process to ensure the organization is meeting safety requirements. Safety assurance will include performance monitoring, SMS assessment, internal safety assessment and management review. The safety assurance program should identify safety performance indicators; monitor compliance through self-auditing; allocate resources for safety oversight; review feedback from inspections, safety analysis and audits; and communicate findings to staff for implementation.

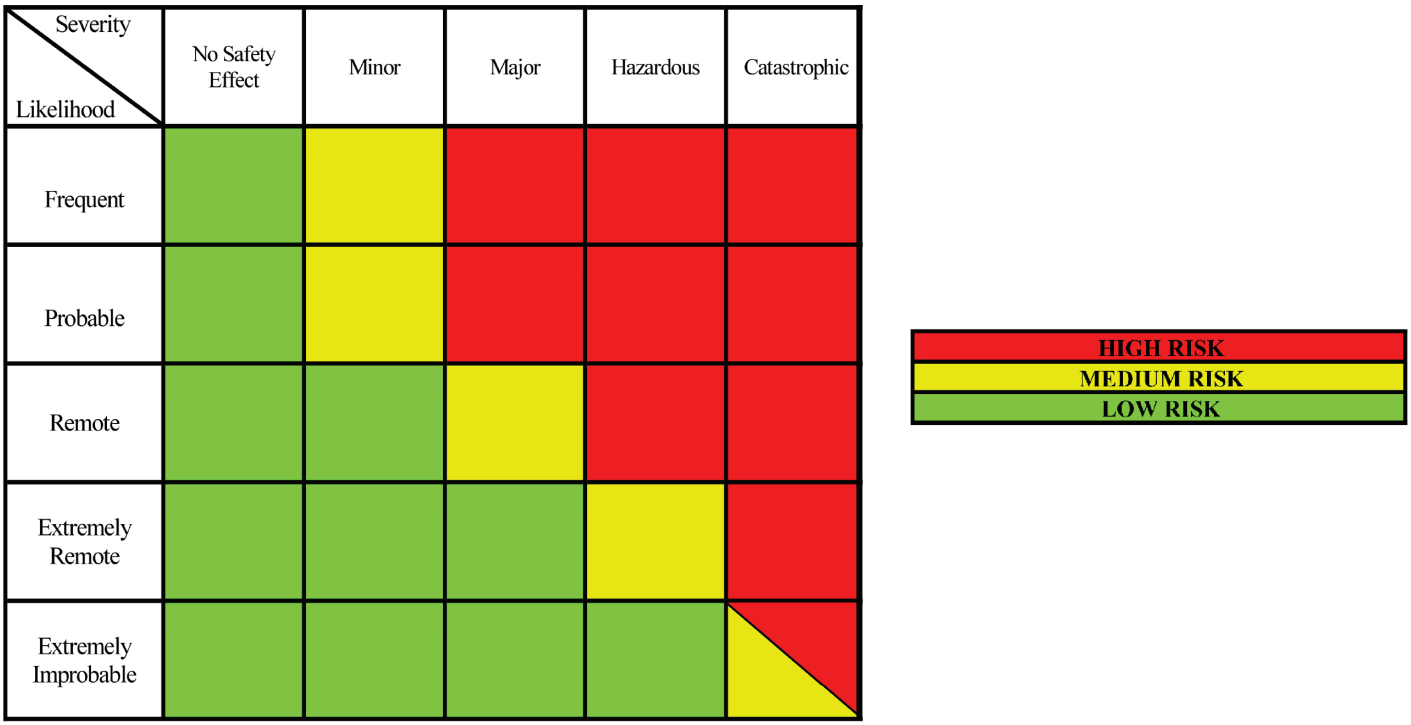
**Safety promotion** is the fostering of the safety culture through training and information sharing and continual improvement. The training related to safety promotion should include overall SMS indoctrination as well as specific job-related training. A process to document and validate the effectiveness of the training is important.

## Risk Levels

The goal of SRM is to mitigate risk to the lowest feasible level. SRM uses three levels of risk:

- High: Unacceptable level of risk. The proposal cannot be implemented or the activity continued unless hazards are further mitigated to reduce the risk to a medium or low level.
- Medium: Acceptable level of risk. Minimum acceptable safety objective. The proposal can be implemented or the activity can continue, but tracking and management are required. All medium-level risks should be assessed to determine if the level of risk can be further mitigated.
- Low: Target level of risk. Acceptable without restriction or limitation. The identified hazards are not required to be actively managed but are documented.

When hazards are evaluated, they are ranked according to severity and likelihood of their risks, as shown on the risk matrix in Figure 10. Even within a risk level, hazards should be ranked




Source: FAA Advisory Circular 150/5200-37, Figure 3-1, Feb. 28, 2007

***Figure 10. Predictive risk matrix.***

so that the hazard with the highest level of risk is addressed first. As part of developing an SMS, an airport should revise the risk matrix and define the likelihood and severity for the airport's operations.

## FAA Use of Safety Management Systems

While most small airports will not be required to have an SMS, they may still be involved in an SMS-related activity because FAA Airports has implemented an SMS for its operations.

The FAA implementation of an SMS for its lines of business is defined in FAA Order 8000.369: Safety Management System. The standards that FAA Airports uses for SRM are defined in the following:

- FAA Order 5200.11: FAA Airports (ARP) Safety Management System (SMS)
- FAA Office of Airports Safety Management System (SMS) Desk Reference
- FAA Standard Operating Procedure 4: Safety Risk Management (SRM) Under the FAA Office of Airports Safety Management System (SMS)

The FAA evaluates projects using the appropriate safety assessment screening form included in FAA Order 5200.11, Appendix D. This FAA Order also defines the process the FAA uses to determine the need to complete a safety assessment screening form. A small airport may be part of FAA-required SRM for projects such as the following:

- FAA review of a new or revised ALP
- Construction project coordination, review of approval, including construction safety and phasing plans
- Approach for project-specific request for modifications of standards
- Modification to design standards

## 4.12 Winter Operations

### Key Insights

*Notices for Airmen for airfield condition assessments should accurately reflect current conditions.*

*Requirements are more stringent for Part 139 airports, which necessitate a snow and ice control plan for airports where snow and icing conditions occur.*

*Non-Part 139 airports should consider the elements in a snow and ice control plan for planning their operations.*

*It is recommended that all airports train employees on equipment and practice operations, especially at night, and prior to the first typical snow event of each season.*

### Key Definitions

**Memorandum of agreement (MOA) or memorandum of understanding (MOU)**: A document outlining the cooperative agreement and the roles and responsibilities of each party to the agreement.

**Runway Condition Assessment Matrix (RCAM)**: Chart providing the criteria to assist airport operators in identifying the runway conditions during winter or rain events.

**Snow and ice control plan (SICP)**: A document describing the airport's approach to snow removal operations, including pre- and post-season subjects, as well as the procedures for addressing winter storms and notifying users of airfield conditions.

**Snow removal equipment (SRE)**: Equipment, typically trucks and tractors, used at an airport to remove snow.

**Takeoff and landing performance assessment (TALPA)**: A method to accurately and consistently determine the runway condition when a paved runway is not dry.

**Windrow**: A long line of piled snow.

### Airfield Clearing

In northern climates, winter operations during snow events present a unique set of challenges to maintain operating surfaces in "no worse than wet" conditions. Contaminants on a runway impede airplane acceleration by absorbing energy in compaction and displacement and by impinging on parts of the airplane after being kicked up by the tires. During deceleration, slush-, snow- and standing water-covered pavements—especially iced surfaces—hamper deceleration rates due to a reduction in the friction coefficient of the runway and the potential for hydroplaning. Thus, airports need a plan to remove snow and ice safely and efficiently from the airport's operational surfaces.

If a Part 139 airport is located where snow and icing conditions occur, a formal SICP is required as part of the airport certification manual (ACM); otherwise, it is noted that an SICP is not needed.

While not a requirement at non-Part 139 airports where snow and icing conditions typically occur, the process of preparing and using an SICP will help the airport identify the priority of areas to be cleaned, the equipment available and the personnel responsible for reporting the field conditions.

In a required SICP, two to three types of priority areas—based on the airport's safety requirements, aircraft operations and navigational aid facilities—will be identified. The sizing of the priority areas should take into account the airport's resource capabilities and the actual aircraft operational needs.

**Priority 1** areas are those that directly contribute to safety and the re-establishment of aircraft operations at a minimum acceptable level of service. The Priority 1 areas will generally consist of the primary runway(s) with taxiway turnoffs and associated taxiways leading to the terminal, portions of the terminal ramp, portions of the cargo ramp, ARFF station ramps and access roads, mutual aid access points (including gates), emergency service roads, access to essential NAVAIDs and centralized deicing facilities, as appropriate to each airport.

**Priority 2** areas are those not essential to re-establishing a minimum acceptable level of service for aircraft operations. Items in this category normally include crosswind or secondary runways and their supportive taxiways, terminal and cargo apron areas not cleared under Priority 1, commercial ramp areas, overnight parking, access roads to secondary facilities and airfield facilities not essential to flight operations or not used on a daily basis.

**Priority 3** areas, if included in the SICP, include all other areas not addressed under Priority 1 or 2. This typically includes the perimeter security road and service roads within the AOA.

### *Equipment Selection*

The goal is for airports to have sufficient equipment to clear within a "reasonable" time 1 inch of snow weighing 25 pounds per cubic foot. The guidance for a "reasonable" clearing time is based on the number of operations at a commercial or noncommercial service airport, as shown in Table 9. To meet these clearing time requirements, typically, only some portions of the terminal or cargo apron are included in the Priority 1 area. These clearing times are used to determine necessary equipment. Only the equipment deemed necessary in the FAA guidance is eligible for grant funding.

## Snow Removal Equipment

FAA Advisory Circular 150/5220-20: Airport Snow and Ice Control Equipment provides guidance to calculate the recommended minimum type and number of SRE, including snow plows, high-speed rotary plows (snow blowers), brooms and spreaders. The types of equipment an airport needs depend on the area to be cleared, the acceptable clearance time, the average annual snowfall amount and available budget. Typically, an airport has a mixture of SRE based on these factors. The following are common types of SRE used at airports:

- Snow plow: Typically used as the primary means of snow control and to windrow the snow. Plows are available in a variety of types and sizes.

**Table 9. Snow removal clearance times.**

| | Clearance Time (hours) | |
|---|---|---|
| **Annual Airplane Operations (includes cargo operations)** | **Commercial Service Airports** | **Noncommercial Service Airports** |
| 40,000 or more | 0.5 | 2.0 |
| 10,000 but fewer than 40,000 | 1.0 | 3.0 |
| 6,000 but fewer than 10,000 | 1.5 | 4.0 |
| Fewer than 6,000 | 2.0 | 6.0 |

Source: FAA Advisory Circular 150/5200-30D, Change 1, Tables 1-1 and 1-2, March 8, 2017

- High-speed rotary plow: The rotary plow, often referred to as a snow blower, relocates the snow from the windrows, over the lights and signs, to an area beyond the safety area and to an acceptable height.
- Broom: The broom has several uses in snow removal. Brooms can be used to remove light snowfalls or water accumulations left by melting snow.
- Spreader/sprayer: These pieces of equipment deploy sand or anti-icing agents (chemical deicers).
- Loader: The loader is critical for moving snow to either melting areas or into trucks for transport around or off the airport to a predetermined disposal location.
- Multifunction: More common at large airports, multifunction equipment is typically a vehicle that can accomplish multiple tasks in a single pass, such as plow, broom and spread.

At small airports, "multifunction" can also refer to equipment that can be outfitted to accomplish several snow removal functions. A loader can be configured to complete broom or plow operations. A dump truck can accomplish plowing, be used with a broom or, if equipped with a spreader, spread sand. In addition, some SRE may also be used for other airport maintenance functions during warm-weather seasons. Using multifunction equipment can have a positive impact on budget expenditures and staff-hour requirements.

## SRE Acquisition

At smaller airports, an available budget for SRE is a critical factor. SRE is eligible for AIP grants; however, it is generally a lower-priority project, so it is most likely funded with the airport's nonprimary AIP entitlement funds or state apportionment AIP funds. Some states may also provide grants separate from the FAA or as a partial match to the AIP grant.

AIP funding restrictions will apply when using AIP funding for equipment purchases. Although state grant restrictions vary, these will usually apply to those grants. The AIP funding restrictions include the following:

- Sole-source suppliers may not be used. (An airport cannot specify a preferred brand to match other equipment.)
- Local procurement preferences may not be used. (Purchases may not be restricted to a local vendor.)
- Nonstandard features beyond those allowed in the FAA advisory circulars may not be added using grants. If these are desired, they may be added using local funding.
- Limits on multipurpose use of AIP-acquired equipment may apply.

FAA Advisory Circular 150/5220-20 provides the guidance on equipment purchases; however, refer to SAE International publications as guidance for the detailed equipment specifications.

A common method for small airports to obtain SRE is to acquire used equipment from larger airports or other governmental entities. Some governmental units, including the armed forces, typically publish acquisition lists for the availability of surplus used equipment. This equipment may be available for free to other governments, except transportation charges, or it may be sold to the highest governmental entity bidder.

### *SRE Storage Building*

In addition to SRE being eligible for AIP funding, buildings to store the SRE when not in use are eligible for grants. FAA Advisory Circular 150/5220-18: Buildings for Storage and Maintenance of Airport Snow and Ice Control Equipment and Materials provides guidance for the site selection and design of buildings used to store and maintain airport snow and ice

control equipment, store approved materials and provide personnel areas required to support the requirements under the airport operator's winter storm management plan. Depending on the quantity, separate facilities may be needed for the storage of anti-icing and deicing chemicals and materials.

## Snow and Ice Control Plan

In addition to having SRE, an airport should have a plan for how to effectively use the equipment to clear the highest-priority areas first. Preparation of the SICP assists the airport with three major functions: (1) pre-season planning, (2) snow removal and notice activities and (3) post-season assessment. FAA Advisory Circular 150/5200-30: Airport Field Condition Assessments and Winter Operations Safety assists airport operators in developing an SICP. The pre-season planning and post-winter season assessments are used by the airport operator to plan for the upcoming or following winter seasons, respectively. This phase may include revising the SICP after the winter season ends. During snowfall season, the plan identifies the procedures and sequence of actions to be taken by the airport operator during winter storms. It also identifies the responsibilities and process for notifying airport users in a timely manner when less than satisfactory conditions exist at the airport, including the closure of runways.

An airport snow and ice control committee may be formed to assist with the planning and assessment of snow and ice control operations. The size and function of the committee will vary by airport size and geographical location. Common members of a snow and ice control committee include airport operations staff, airline station personnel, FBOs, ATCT personnel and other key users.


For Part 139 airports, as determined by the administrator, each certificate holder whose airport is located where snow and icing conditions occur must prepare, maintain and carry out a SICP in a manner authorized by the administrator. FAA advisory circulars contain methods and procedures for snow and ice control equipment, materials and removal that are acceptable to the administrator.

The SICP must include, at a minimum, instructions and procedures for the following:

- Prompt removal or control, as completely as practical, of snow, ice and slush on each movement area.
- Positioning snow off the movement area surfaces so all air carrier aircraft propellers, engine pods, rotors and wing tips will clear any snowdrift and snowbank as the aircraft's landing gear traverses any portion of the movement area.
- Selection and application of authorized materials for snow and ice control to ensure that they adhere to snow and ice sufficiently to minimize engine ingestion.
- Timely commencement of snow and ice control operations.
- Prompt notification (in accordance with FAR §139.339) of all air carriers using the airport when any portion of the movement area normally available to them is less-than-satisfactorily cleared for safe operation by their aircraft.

An editable template for the SICP based on the Part 139 SICP template is included in *ACRP WebResource 6*.

While most small airports where snow and icing conditions occur are not required to have an SICP, it is a best practice to consider all the items contained in the Part 139 plan and prepare a plan tailored to the level of activity at the airport. *ACRP Synthesis 67: Airside Snow Removal Practices for Small Airports with Limited Budgets* focuses on snow removal strategies, especially for small airports.

## Snow Removal Responsibilities

When planning snow removal operations, the airport manager should consider who is available to conduct the operations and any snow removal requirements included as part of a tenant's lease. All entities that will conduct snow removal should practice together before the season to be familiar with the airfield and equipment at all times, even in the dark. If an airport has an ATCT, all snow removal units operating in aircraft movement areas must maintain radio communication with the ATCT or be under the direct control of a designated supervisor, who in turn is in direct communication with the ATCT. If no tower exists, the common traffic advisory frequency (CTAF) or UNICOM should be monitored at all times.

Options for staffing snow removal operations include in-house staff, sponsoring governmental agency staff, contractors and tenants:

- **In-house staff**: Utilization of airport staff and airport-owned equipment for winter operations is the most effective way to ensure the clearing is completed in accordance with the SICP. Considerations for this include the availability of staff or additional staff to be added during the events and whether the budget is sufficient to pay additional staff or overtime for existing staff and to provide the equipment necessary to perform the operations.
- **Governmental agency staff**: Cities and counties in areas of snow are usually staffed and equipped to handle snow events. They may not, however, have sufficient staff and equipment to add the requirements of the airport SICP. If this method is chosen, an MOU or MOA should be utilized to document the expectations and responsibilities of both entities.
- **Contractors**: Private contractors may be used to perform or augment the airport's functions, as contained in the SICP. The written agreement with the contractor should include required response times, equipment requirements, staffing, training required, disposal requirements and damage responsibility.
- **Tenants**: All airport leases and agreements should be clear and specific and cover the duties and responsibilities of lessees to carry out their assigned snow and ice control duties.

When planning staffing for snow removal operations, remain aware of driver fatigue. Consideration should be given to monitoring the "windshield time" of drivers (length of shift) operating SRE, because operator fatigue could become a contributing factor for runway incursions. In response, some airport operators have implemented limits on driver-operating hours. Provisions for suitable areas to allow drivers to rest at the airport between shifts and on breaks should be considered. Feeding staff who are on duty or on standby is important to maintaining safety and morale. Remember that, during severe conditions, staff may not be able to report for duty or leave the airport for meals and rest. It is not uncommon to have low visibility or whiteout conditions during a snow event. It is important for equipment operators to maintain visual contact with their surroundings during snow-clearing operations, especially for operations in an echelon formation (a group of equipment operating together). The SICP should specify procedures to follow if visibility suddenly drops to near zero, or whiteout conditions exist while clearing operations are in progress.

## Takeoff and Landing Performance Assessment

In an effort to provide more consistent reporting of runway conditions, on October 1, 2016, the FAA initiated the use of takeoff and landing performance assessment (TALPA). The TALPA initiative aims to reduce the risk of runway overruns by providing airport operators with a method to accurately and consistently determine the runway condition when a paved runway is wet. This information will enable airplane operators, pilots and flight planners to more accurately determine the distance required to stop on a wet or contaminated paved runway.

**Snow Removal Best Practices**

***Runways:*** Focus runway snow-clearing operations on keeping the entire primary runway(s), as near as practicable, bare from snow accumulations or ice buildup. Use displacement plows, in tandem if more than one, to windrow snow into a single windrow that can be cast over the edge of runway lights by a rotary plow. Rotary plows should throw snow a sufficient distance from runways' and taxiways' edges so adequate clearance is available between airplane wings and engine nacelles and the cast snow banks.

***Taxiways:*** Much like runways, taxiways should be cleared to the extent that will allow the safe movement of aircraft transitioning from the runway to the terminal ramp.

***Aprons:*** A sufficient area of the apron should be cleared to allow for the parking of all aircraft expected to use the airport during the snow event.

***Airfield signs, lights and NAVAIDs:*** Keep these clean of contaminants to maintain the legibility of signage. Priority should be given to lights and signs associated with hold lines, direction and location signs and instrument-landing-system critical areas. Common methods to remove snow from signs include using a truck mounted with an air-blast unit, spraying the faces of signs with an approved liquid deicer or hand shoveling. LED lights are a challenge to find in a snow bank.

***Control of snowbanks***: Snow clearing should not allow snow banks, mounds or ridges exceeding 2 feet to be placed along the edges of the prescribed snow clearance areas. Snow banks should not be placed off the approach ends of runways.

***Controlling drifting snow***: Preventing snow from drifting onto operational areas at airports during severe winter storms reduces the duration and frequency of snow clearing.

- ***Snow fences***: Snow fences that are properly designed and located can reduce windblown snow across airfields. Prior to any snow fence installation in the vicinity of a NAVAID system, the airport operator must contact the local FAA technical operations staff for approval.
- ***Snow trenches***: Snow trenches that catch and store drifting snow may be considered by airports with heavy snowfalls. This approach is considered an expedient way to control snow from drifting after it has been cleared to the edge of the runway.

***Snow disposal***: In areas where large accumulations of snow and prolonged temperatures below freezing prevent snow from melting, consideration should be given to how and where the disposal of snow will be accomplished.

- ***Hauling***: Snow can be hauled to a remote area of the airport or to a predesignated area off the airport.
- ***Snow melting***: Snow melters or melting pits can be used to dispose of the accumulated snow. These should be located outside the Priority 1 area.

Federally obligated airports are required to use TALPA procedures to conduct runway assessments and to report those conditions in newly formatted field condition (FICON) NOTAMs. Runway conditions must be reported in one-third sections. Using NOTAM Manager, the electronic NOTAM filing will expedite the process and make it easier. As with all NOTAMs, a record of the dissemination (issuance and cancellation) of NOTAM information must be retained by the airport operator.

Reporting TALPA will allow pilots and flight planners to use the information, along with manufacturer's aircraft-specific data, to determine the runway length needed to safely stop an aircraft after an aborted takeoff or a landing. Additional information about TALPA and its use is available on the FAA's website.

## Runway Friction Measuring

With the use of TALPA, Mu values for runway friction can no longer be directly or informally reported. However, FAA-approved friction-measuring equipment may still be employed to help determine the effects of friction-enhancing treatments. This equipment can show the trend of a runway as to increasing or decreasing friction. Guidance on continuous friction-measuring equipment is in FAA Advisory Circular 150/5320-12: Measurement, Construction and Maintenance of Skid-Resistant Airport Pavement Surfaces. Also, Appendix D of FAA Advisory Circular 150/5200-30 contains a list of decelerometers that meet the FAA technical specifications.

Friction-measuring equipment needs to be calibrated. As the equipment operator, the airport staff is responsible for ensuring that the equipment is correctly calibrated in accordance with its operations manual.

Runway friction survey requires advance coordination because, while the tests are being conducted, the runway may be closed to airplane operations. As part of coordinating the friction surveys, an air traffic control clearance or communication on the CTAF or UNICOM when the tower is closed or there is no tower is essential for safety.

When using a decelerometer to obtain an accurate friction assessment, a minimum of three braking tests are conducted and averaged for each runway zone with a vehicle speed of 20 miles per hour.

After conducting friction-measuring tests, the Mu value can be used with the RCAM to identify runway conditions when contaminants are present. Using the runway condition description and Mu value, the airport operator can identify the "code" representing the runway condition to report via the NOTAM system.

## Budgeting for Snow Removal

Budgeting for winter events can be difficult, because annual snowfall accumulation predictions can be unreliable. Also, the timing of winter storms, whether they are during the workday or at night and weekends, will affect how much staff overtime is involved. The frequency of events and severity and whether ice is involved are factors that can greatly affect the overall equipment and staffing costs.

To better account for the variability of snow removal costs, an analysis of the budget expenditures of a select number of previous years should be used. The budgeting process should include a means to address overages resulting from higher-than-expected operations. Also, the budget calendar year should be considered if the snow season falls in more than one budget year. SRE maintenance and replacement should also be included in the annual budget process to

ensure that the equipment is operational throughout the snow season. Allocating budget funds to a reserve account for future acquisitions should also be considered.

## Aircraft Deicing/Anti-icing

An FBO or specialized aviation service operation may offer aircraft deicing or anti-icing services to its users, airports or tenants. Deicing operations are most common at large commercial service airports but may also be used at small airports with commercial service or transient corporate operations and can be utilized for any aircraft. It is also common for based-aircraft owners, especially corporate operators, to keep their aircraft in heated hangars.

Keeping an aircraft free of frozen precipitation is important to prevent the loss of lift. All surfaces cannot necessarily be cleaned and protected in the same conventional deicing or anti-icing manner as the control surfaces. Some areas require only a cleaning operation, while others may need protection against freezing. For example, the use of hot air may be required when deicing the landing gear or propellers.

Deicing is defined as the removal of snow, ice or frost from a surface. Anti-icing is applying chemicals that not only deice, but remain on a surface and continue to delay the reformation of ice for a certain period of time or prevent the adhesion of ice. The use and storage of deicing agents is subject to environmental regulations that usually require the capture of used fluids and their appropriate disposal, such as permitted discharge to a sanitary sewer. If deicing is occurring at an airport, it is essential that the entity conducting the deicing has obtained the appropriate permits and prepared the appropriate pollution prevention documents.

## 4.13 Special Events

### Key Insight

*Special events can be taxing on airport staff and operations but can provide benefits to the airport through awareness of the airport, its economic contributions to the community and development opportunities.*

### Key Definition

**Special event**: An activity that occurs for a limited or short duration, presented to a live audience.

### Benefits of Special Events

Special events can be aeronautical or nonaeronautical and, while they add to an airport operator's workload, can pay dividends, such as the following, in community relations:

- **Enhance public awareness of the airport**. Most people in the community are probably aware of the airport but do not understand the airport's role. The airport staff should join with businesses at the airport and take advantage of any special event to promote the benefits the airport brings to the community. Examples of benefits that might be promoted are Angel Flights, economic benefits, employment numbers and opportunities, and youth educational opportunities such as the Experimental Aircraft Association's (EAA) Young Eagles® flights or the United States Air Force's Civil Air Patrol Cadet Program.
- **Stimulate interest in and growth of the airport and aviation**. Take the opportunity during special events to promote land and buildings available for aeronautical and nonaeronautical lease, employment opportunities at the airport, businesses at the airport and educational classes offered at local colleges and high schools.
- **Foster community support**. Providing an overview of the benefits the airport contributes to the community will help generate community support.
- **Provide economic benefits**. Depending on the type and size, most special events provide an economic benefit to the community. Catering and participants/attendees making use of local restaurants, hotels and stores will bring additional revenue to the community, including sales tax revenues.
- **Generate revenue for the airport and charitable organizations**. Most special events are organized by charitable organizations as a fundraiser for the organization.

Special events may be sponsored by the airport or an outside entity, in which case an airport use agreement should be made. Airport staff should be involved in all phases of a special event in order to be aware of all plans for conducting the event.

#### *Aeronautical Special Events*

Aeronautical special events include air shows, fly-ins, airport open houses (if aircraft are on display) and EAA Young Eagles or Eagle Flights® events. Air shows involve aerobatic demonstrations and are especially complex, because detailed coordination with the FAA is required. These coordination activities include the application for waiver, FAA Form 7711-2, and in some cases the issuance of NOTAMs or temporary flight restrictions (TFRs). The FAA issuance of a waiver can be initiated online at the FAA's Flight Standards Information Management System website. The International Council of Air Shows website is an excellent source of information for air show organizers.

Aeronautical events that do not involve aerobatics are less complicated but still require a high degree of planning to ensure the safety of participants, guests and the flying public.

### *Nonaeronautical Special Events*

Nonaeronautical events can include car shows, distance runs, concerts, building dedications or the use of airport facilities for charitable events (dances, banquets, etc.). **An airport or any part of the AOA developed or improved with federal funds may not be closed for special, nonaeronautical outdoor events without prior FAA approval**. Nonaeronautical events on the landside may require FAA notification if they interfere with navigable airspace. Prior FAA approval is required by federal law and reflected in Grant Assurance 19: Operation and Maintenance. You should contact your FAA ADO several months before the event to initiate the process to obtain the appropriate approval for a special event. An FAA Southern Region newsletter provides a good summary of items to consider related to airport compliance and nonaeronautical events.

## Conducting Special Events

Similar preparation and execution are needed for aeronautical and nonaeronautical events. *ACRP Synthesis 41: Conducting Aeronautical Special Events at Airports* contains information about planning for aviation events. A video on the topic is available from an ACRP webinar on special events planning. The Wisconsin Bureau of Aeronautics has a nonaeronautical events reference document to assist its airports in meeting the requirements for such events. The following subsections summarize some of the information contained in *ACRP Synthesis 41*.

### *Planning Phase*

The planning phase should be initiated at least 12 months prior to the event date. During the initial planning phase, the following questions should be answered:

- What are our goals for holding the event?
- What are the reasons for holding the event?
- Who will be responsible for holding the event?
- What type of event will we have?
- What will be our event theme?
- When will the event be held?
- Where will the event be held?
- What will be the duration of the event?
- Should an events organization team be hired?

### *Organizing Phase*

The organization phase typically begins immediately after the planning phase, usually 11 months before the event. Numerous items must be considered and enacted during this phase that includes establishing committees to handle issues such as event promotion, sponsorships, volunteers, event setup and teardown, crowd containment and parking. Establishing a realistic budget during this phase is critical to the event's success.

### *Event Execution Phase*

This phase consists of putting into motion the planning and organization that have occurred over the previous year. The length of the event's execution will vary depending on the complexity of the event and will include all setup activities—including parking, crowd control, entrance and exit points and facilities such as tables, chairs and tents—and the event itself.

### *Return to Normal Operations and Event Analysis*

Often referred to as the cleanup phase, this phase is frequently overlooked and under-planned. The proper execution of this phase is critical for the airport's safe return to normal operations. Proper planning and execution must occur, or the event organizers may not be allowed to use the airport as a venue for the event in the future. Volunteers and adequate staffing must be scheduled for the timely execution of this phase. An event debriefing should be scheduled as soon as possible after the event to discuss what went right or wrong.

## Supporting Off-Airport Special Events

In addition to hosting special events, a small airport may be called on to support a special event in the community, such as a larger athletic competition, tradeshow or other significant gatherings, to which attendees will fly in. In some instances, the airport may be asked to help arrange a flyby for the event. This could occur during outdoor events and parades, or at any outdoor event where the national anthem is played. *ACRP Synthesis 57: Airport Response to Special Events* and the ACRP webinar on special events planning provide insights from other airports' experiences.

## 4.14 Americans with Disabilities Act

### Key Insights

*The Americans with Disabilities Act was adopted in 1990 and is codified in 42 U.S.C. Chapter 126.*

*The Americans with Disabilities Act prohibits discrimination against individuals with disabilities in all areas of public life, including jobs, schools, transportation and all public and private places that are open to the general public. As a public place open to the general public, small airports must meet Americans with Disabilities Act requirements.*

### Key Definitions

**Alteration**: A change to a facility, including but not limited to, remodeling, renovation, rehabilitation, reconstruction, historic restoration, and changes or rearrangement in structural parts and elements.

**Auxiliary aids**: Qualified interpreters, note takers, transcription services, writing materials, telephone headset amplifiers, assistive listening devices, assisted listening systems, telephones compatible with hearing aids, closed- and open-caption decoders, text telephones (telephone devices such as TTYs), videotext displays or other aural delivery devices, qualified readers, taped text audio recordings, Braille materials, large-print materials or other materials for visual delivery.

**Disability**: With respect to an individual, a physical or mental impairment that substantially limits one or more of the major life activities; a record of such an impairment; or being regarded as having such an impairment.

**Public accommodation**: A facility, operated by a private entity, with operations that affect commerce and provide one or more of the following: lodging, food and beverage service, exhibition or entertainment, places for public gathering, sales or rental of goods or services, public transportation, recreational services, educational services, social services and places for exercise or recreation.

**Public entity**: Any state or local government, or any department, entity, special district or other instrumentality thereof.

**Service animal**: A dog that has been trained to do work or perform tasks for an individual with a disability. The tasks performed by the dog must be directly related to the person's disability.

**Undue burden**: Significant difficulty or expense.

### Overview of the Americans with Disabilities Act of 1990

The Americans with Disabilities Act (ADA) is codified in 42 U.S.C. Chapter 126. The requirements of the act cover virtually all private and public entities. The ADA contains five titles:

- **Title I—Employment**: Reasonable accommodations must be made to allow an otherwise qualified disabled employee to perform the essential functions of the job or to enjoy the privileges and benefits afforded to other employees.
- **Title II—Public Services: State and Local Government**: Nondiscrimination on the basis of disability in state and local government services. The public entity's services, programs or activities, when viewed in their entirety, must be readily accessible to and usable by individuals

with disabilities. The standard applies to all existing facilities, but public entities are not necessarily required to make each of their existing facilities accessible.

- **Title III—Public Accommodations and Services Operated by Private Entities**: Provides for nondiscrimination on the basis of disability in full and equal enjoyment of goods, services, facilities, privileges, advantages or accommodations offered by a place of public accommodation.
- **Title IV—Telecommunications**: Requires telephone and internet companies to provide a nationwide system of interstate and intrastate telecommunication relay service that allows individuals with hearing and speech disabilities to communicate over the telephone.
- **Title V—Miscellaneous Provisions**: Provisions for relationships to other laws, state immunity, impact on insurance providers and benefits, prohibition against retaliation and coercion, illegal use of drugs, and attorneys' fees provisions. It also provides a list of certain conditions that are not to be considered as disabilities.

## Application to Small Airports

FAA Advisory Circular 150/5360-14: Access to Airports by Individuals with Disabilities provides systematic guidance specific to airport compliance with current laws and regulations regarding serving individuals with disabilities. ACRP also has several resources addressing accommodating travelers with disabilities, including *ACRP Synthesis 51: Impacts of Aging Travelers on Airports*, *ACRP Synthesis 90: Incorporating ADA and Functional Needs in Emergency Exercises*, and *ACRP Report 177: Enhancing Wayfinding for Aging Travelers and Person with Disabilities*.

### *Title I—Employment*

In employing staff at small airports, the airport operator must make reasonable accommodations for any qualified employee with a disability. If a position requires an employee to accomplish specific tasks, such as lifting, seeing, hearing or driving a vehicle, these must be included in the job description. While many small airports employ a small staff that must be able to accomplish multiple tasks, airport operators should consider whether all tasks are requirements of the position and what accommodations could be made. For example, if a position is office support, there may be more opportunities to make reasonable accommodations for a person with a disability than a position that involves frequently working on the airfield.

### *Title II—Public Services: State and Local Government*

Most publicly owned small airports are owned by a governmental entity. Therefore, the facility and services offered should be accessible. Therefore, small airports should consider how access to the facility can be provided, as well as customer service and accommodation of service animals. The ADA National Network provides a list of ADA customer service quick tips. ADA.gov provides answers to frequently asked questions about service animals and the ADA.

Barriers to access at a small airport should be modified. If barriers cannot be removed but can be improved, the improvement should be made. When making improvements, the first priority should be to provide access to the airport from public sidewalks, parking or transportation. These improvements would include measures such as installing an entrance ramp, widening entrances and providing accessible parking spaces.

Access to public meetings of the airport's governing body is important. If this access cannot be accommodated at the airport, the meetings

**Allowable Questions to Determine if a Dog is a Service Animal**

- Is the dog a service animal required because of a disability?
- What work or task has the dog been trained to perform?

Do not request documentation or a demonstration or inquire about the nature of the person's disability.

should be moved to an ADA-accessible location, typically another facility of the sponsoring governmental agency.

The second priority should be to take measures to provide access to the areas of the airport where goods and services are available to the public, such as adjusting the layout of display shelves, rearranging tables, providing Braille and raised-character signs, widening doors, providing visual alarms and installing ramps. The third priority should be to take measures to provide access to restroom facilities. These measures include items such as removing obstructions for a clear route to the facilities, widening doors, installing ramps, providing accessible signs, widening toilet stalls and installing grab bars. The fourth priority for an airport is any other measure necessary to provide access to the goods, services and facilities.

Where a small airport can demonstrate that barrier removal is not readily achievable, the public accommodation shall not fail to make its goods, services or accommodations available through alternative methods, such as providing curb service, retrieving merchandise from inaccessible shelves or relocating activities to accessible locations. If a small airport is developing a new facility that will be available to the public, all provisions of the ADA should be considered in its design and development.

### *Title III—Public Accommodations and Services Operated by Private Entities*

When private entities lease space from a public entity to provide public services (e.g., FBO or concessionaires), the services are subject to ADA requirements. Final responsibility for adherence with Title II and Title III requirements rests with the public entity, which must meet the requirements directly or through the agreements it executes with lessees and sublessees. The airport is obligated to ensure compliance, either through its own actions or through the lease conditions placed on the tenant.

### *Title IV—Telecommunications*

At small airports with commercial passenger service, a telecommunications company may install a telephone, known as a TTY (text telephone) or TDD (telecommunication device for the deaf), to allow persons with hearing or speech disabilities to communicate by sending text over the phone. The availability of mobile phones with text functions has greatly enhanced the communication opportunities for persons with hearing and speech disabilities.

## 4.15 Unmanned Aircraft Systems

### Key Insights

*The community may look to the airport manager, as an aviation professional, for information about operating unmanned aircraft systems. The FAA provides resources to assist in answering questions.*

*Unmanned aircraft systems have existed since the 1970s, primarily in the military and other governmental agencies. More recent technological innovations have enabled the rapid increase in small, more affordable unmanned aircraft systems that can be operated by nonpilots.*

*Because the FAA is charged with ensuring the safety of the National Airspace System, growth in the operating of small unmanned aircraft systems by individuals and organizations has challenged the FAA to respond in an effective and constructive manner.*

*FAR Part 107 contains the regulations for nonhobbyist small UAS operators. Part 107 does not apply to model aircraft, which is regulated under Section 336 of Public Law 112-95.*

### Key Definitions

**FAR Part 107: Small Unmanned Aircraft Systems**: Part 107 establishes the registration of airmen and the certification and operation of small (weighing less than 55 pounds) unmanned aircraft systems within the United States.

**National Airspace System (NAS)**: The airspace, navigation facilities and airports of the United States along with their associated information, services, rules, regulations, policies, procedures, personnel and equipment.

**Remote pilot airman certificate**: FAA authorization to operate an unmanned aircraft system for other-than-recreational purposes in the United States. This replaces the previous certificate of authorization under Section 333 of the FAA Modernization and Reform Act of 2012.

**Remote pilot in command with UAS rating**: A certified remote pilot airman responsible for the small unmanned aircraft systems operation.

**Section 333 exemption**: Part of the FAA Modernization and Reform Act of 2012 that predates FAR Part 107; a case-by-case approval process for commercial operations of unmanned aircraft systems in the National Airspace System that provides operators with a safe and legal entry into the National Airspace System, subject to certain requirements and restrictions.

**Small unmanned aircraft**: An unmanned aircraft weighing less than 55 pounds (25 kilograms), including everything that is onboard or otherwise attached to the aircraft.

**Small unmanned aircraft system(s) (sUAS)**: A small unmanned aircraft and its associated elements, including communication links and control components that are required for the safe and efficient operation of the small unmanned aircraft in the National Airspace System.

**Unmanned aircraft**: An aircraft operated without the possibility of direct human intervention from within or on the aircraft.

**Unmanned aircraft system(s) (UAS)**: An unmanned aircraft and its associated elements, including communication links and control components that are required for the safe and efficient operation of the unmanned aircraft in the National Airspace System.

**Visual line of sight**: Unaided (corrective lenses and/or sunglasses exempted) visual contact between a pilot in command or a visual observer and an unmanned aircraft system, sufficient to maintain safe operational control of the aircraft, know its location and be able to scan the airspace in which it is operating, to see and avoid other air traffic or objects aloft or on the ground.

**Visual observer**: A person designated by the remote pilot in command to help him or her and the person manipulating the flight controls of the small unmanned aircraft system to see and avoid other air traffic or objects aloft or on the ground.

## Managing UAS Operations at Small Airports

Because the UAS regulatory framework and industry are quickly evolving, best practices guidance is subject to being quickly outdated while the FAA continues to refine its UAS-related regulations. Thus, this section provides some basic background on UAS operating requirements and guidance for the first steps to develop individual airport approaches to manage UAS impacts on operations and local airspace:

- Know the regulations. Stay up to date on the evolving regulations related to UAS integration into the NAS and what operations are permitted, including where and at what altitude. *ACRP Legal Research Digest 32: Evolving Law on Airport Implications by Unmanned Aerial Systems* provides guidance to better understand the basic legal and operational issue by civil UAS.
- Engage with the local UAS community. This can be accomplished by reaching out to the local Academy of Model Aeronautics chapter, through hobby stores or local UAS hobby organizations. Even engaging with the local community to educate them about the airport, and the areas that should be kept clear around the airport, is beneficial.
- Engage with the state aeronautics agency. Seek technical assistance and guidance on state guidelines related to minimizing impacts from UAS operations on airport operations and airspace.
- Engage with the local planning or zoning authorities. Create a clear and enforceable zoning ordinance or policy that aims to minimize impacts by unauthorized UAS operations.

## UAS Regulations

Three federal regulations have been important to the evolution of UAS operations:

- **Section 333**: Part of the FAA Modernization and Reform Act of 2012 that grants the FAA the authority to determine and grant UAS operators the authorization to operate in the NAS, subject to certain restrictions and requirements. While superseded by Part 107, Section 333 is still applicable for some types of UAS operations, such as a UAS weighing more than 55 pounds.
- **FAR Part 107** (**Part 107**): Federal regulations that provide rules on remote pilot certification, aircraft registration and marking, aircraft airworthiness and the operation of sUAS in the NAS. Part 107 provides the means to obtain certification to operate as a remote pilot in command of an sUAS for commercial purposes.
- **Special Rule for Model Aircraft** (**Section 336 of Public Law 112-95**): Federal regulations that provide the means by which model aircraft can be operated safely in the NAS. It had been the basis for recreational operation of sUAS until the passage of the FAA Reauthorization Act of 2018.

Governmental entities such as law enforcement, public universities, state governments and local municipalities can operate sUAS under Part 107 or obtain a certificate of waiver or authorization. Because universities are developing degree programs in UAS, some small airports have

the opportunity to partner with these institutions to support the UAS operations with the appropriate approvals and agreements.

State regulations vary widely from state to state. Some states have been waiting for the federal regulations before promulgating their own rules, because the federal government has jurisdiction over the airspace. Other states have been more active in instituting restrictions on operations by certain types of sUAS through implementing notification requirements. States have also passed regulations to address privacy concerns related to the use of sUAS over private property or by law enforcement organizations. State aeronautics agencies are a good resource for up-to-date information on state regulations.

Local regulations, like state regulations, vary broadly. Your local government planning or zoning organization is a resource regarding any potential regulations that may exist. One of the common localized regulations is the designation of no-fly sUAS zones.

## Unmanned Aircraft Operations

There are two classes of UAS: small (weighing less than 55 pounds) and large UAS. Many sUAS are hand-launched or need limited space for takeoff and landing, allowing their operations to occur off airport. Within the large UAS class are more aircraft-like UAS that require airport facilities for their operations. *ACRP Report 144: Unmanned Aircraft Systems (UAS) at Airports: A Primer* focuses on large UAS and provides lessons learned from airports experienced in UAS operations; however, it was published in 2015 while the industry was rapidly changing and before Part 107. With the rapid proliferation of sUAS, most small airports will more frequently come in contact with, or field questions on, sUAS operations. The FAA's UAS website is a good resource for answers to frequently asked questions and other information on UAS operations. It also provides updates as requirements change, such as with the signing of the FAA Reauthorization Act of 2018 that establishes new conditions for recreational use of UASs, also referred to as drones.

### MODEL AIRCRAFT OPERATION (AC91-57A)

1. The aircraft is flown strictly for hobby or recreational use.
2. The aircraft operates in accordance with a community-based set of safety guidelines and within the programming of a nationwide, community-based organization.
3. The aircraft is limited to no more than 55 pounds, unless otherwise certified through a design, construction, inspection, flight test and operational safety program administered by the community-based organization.
4. The aircraft operates in a manner that does not interfere with, and gives way to, any manned aircraft.
5. When flown within 5 miles of an airport, the operator of the model aircraft provides prior notice of the operation to the airport operator and the airport traffic control tower (if one is located at the airport). Model aircraft operators flying from a permanent location within 5 miles of an airport should establish a mutually agreed-on operating procedure with the airport operator and tower.

There are two types of sUAS operations: recreational or hobby and nonrecreational (commercial) use. Table 10 summarizes the similarities and differences between the two types of operations. Until the passage of the FAA Reauthorization Act of 2018, only pilots in command

**Table 10. Commercial versus recreation sUAS flying.**

| Characteristic | Commercial | Recreational |
|---|---|---|
| Remain clear of nonparticipating personnel | ✓ | ✓ |
| Maintain visual line of sight | ✓ | ✓ |
| Airspace restrictions | ✓ | ✓ |
| 400 feet AGL maximum altitude | ✓ | ✓ |
| Units required to register with FAA (between 0.55 and 55 lbs.) | ✓ | ✓ |
| Pilot certification: Part 61 or remote pilot | ✓ | ✓* |
| Initial and recurring training | ✓ | ✓* |
| Use | Compensation of services or deliverables | Strictly for personal use |

*Requirement changed with FAA Authorization Act of 2018. New requirements being implemented.
Source: FAA UAS website, accessed December 1, 2018.

of nonrecreational operations were required to hold a remote pilot certificate. The purpose of the remote pilot certificate is to provide an understanding of the NAS, flight rules and other pertinent information to operators. This is necessary, because under Part 107, a remote pilot is no longer required to be a Part 61 licensed aircraft pilot. To be licensed as a Part 107 remote pilot, a person must pass an aeronautical knowledge test—or hold a Part 61 pilot certificate with a flight review within the last 24 months—and complete an FAA-provided sUAS online training course. The person also must be vetted by the TSA and be at least 16 years old. Unfortunately, there are many recreational operators of sUAS who are not well versed on those requirements.

When doing community outreach, look for opportunities to educate potential recreational sUAS operators on airport operations and the B4UFLY app.

With the passage of the FAA Reauthorization Act of 2018 that repealed use of the Special Rule for Model Aircraft for recreational drone operations, the FAA is evaluating the change in law and how implementation will proceed. Recreational drone operators are to follow all current policies and guidance and should monitor the FAA's UAS website for updates. Airport managers should look for opportunities to educate the recreational sUAS community about the potential safety hazards of operating UAS near airports. ACRP has released a draft guidebook about "Managing Unmanned Aerial Systems (UAS) in the Vicinity of Airports."

UASs over 0.55 pound are required to be registered with the FAA. sUASs (between 0.55 pound and 55 pounds) are registered through www.registermyuas.faa.gov. UASs of 55 pounds or heavier use a different registration process than sUASs. There are civil and criminal penalties for the UAS owner if the UAS meets requirements for registration but is not registered.

## UAS Opportunities and Challenges

UASs provide small airport managers with opportunities and challenges. There are opportunities to use this new technology to benefit the airport by gathering data or monitoring activity at and around the airport. For example, the UAS technology provides reduced-cost opportunities to gather aerial mapping data, especially for items such as approach surveys or for aiding construction observation with aerial photography. They may also provide an opportunity to generate revenue, if UAS operators desire to lease facilities. However, small airport managers should be familiar with Part 107 prior to engaging any of these services. When a UAS operator is selling services, he or she is considered a commercial operator and must meet the commercial operator regulations. If the airport operator is conducting the UAS operation for the benefit of the airport, it is not a recreational operation and should comply with Part 107 requirements. Local law enforcement and news agencies also frequently use sUAS.

sUAS may operate up to 400 feet AGL, or higher as long as the sUAS remains within 400 feet of a structure. Aircraft most commonly operate below 400 feet AGL when arriving and departing airports. Thus, sUAS operations around airports or around structures pose the greatest potential for conflict with aircraft. sUAS operations in Class B, C, D or E airspace are allowed with an appropriate waiver or authorization from the FAA and permission from the tower. Small UAS operations in Class G, uncontrolled airspace, are allowed without prior permission. An sUAS operator initiates a waiver request on the FAA's website. Thus, if a small airport has a tower, UAS pilots must contact the tower to obtain permission for their planned flights. If a small airport is surrounded by uncontrolled airspace at 400 feet or below, no permission is required. However, airport managers may be contacted by recreational operators of sUAS that operate under model aircraft standards, because they are required to notify the airport operator when flying an sUAS within 5 miles of an airport.

There are also flight restrictions for sUAS for security-sensitive airspace, airspace under TFR, restricted or special-use airspace, stadiums and sporting events (prohibited within 3 miles) and wildfires. The FAA has an app, B4UFLY, to make operators aware of where they should and

should not fly and where there may be conflicts. B4UFLY displays active TFRs. B4UFLY is geared toward recreational pilots, but commercial operators may also find it useful.

Under the Section 333 exemption, all sUAS operators were required to file a NOTAM before each flight. The Part 107 regulation does not address NOTAM filing. However, waivers or authorization granted for sUAS operations in Class B, C, D or E airspace typically include the requirement to file a NOTAM. While not required for flying in Class G airspace, especially at or near an airport, it is a best practice to file a NOTAM. Remote pilots can file a NOTAM through the Flight Service website or by calling (877) 487-6867. Other operations within the NAS should also file a NOTAM. This allows aircraft pilots to receive notices of UAS activity when obtaining a flight briefing. There are commercial apps under development that allow recreational sUAS pilots to digitally notify airports and gather airspace information.

As a small airport manager, remember that aircraft and UAS share the NAS and members of the community are likely to look to you for guidance, so use the tools available, especially through the FAA's UAS website, to stay up to date.

## 4.16 Operating Certificate Compliance

### Key Insights

*Although non-air carrier airports are not required to meet FAR Part 139 certification standards, many states have statutory provisions that require public-use airports to meet minimum licensing or certification criteria.*

*Part 139 airport certification criteria apply only to those airports certificated under FAR Part 139 to support scheduled or unscheduled air carrier operations. Those airports must meet the Part 139 certification requirements.*

*The Part 139 certification process was put in place to ensure safety in air transportation and involves an inspection of the airport for compliance with the certification requirements and the retention of required records.*

### Key Definitions

**Airport operating certificate (AOC)**: A certificate issued under FAR Part 139 for the operation of a Class I, II, III or IV airport.

**Scheduled operation**: Any common carriage passenger-carrying operation for compensation or hire conducted by an air carrier, for which the air carrier or its representatives offer in advance the departure location, departure time and arrival location.

**Unscheduled operation**: Any common carriage passenger-carrying operation for compensation or hire, using aircraft designed for at least 31 passenger seats, conducted by an air carrier for which the departure time, departure location and arrival location are specifically negotiated with the customer or the customer's representative.

### Airport Certification


Since state requirements vary, airport managers should closely coordinate compliance with their respective state aeronautics agencies.

The Part 139 AOC is a permit by the rules, for which an airport commits to meeting the established requirements without continuous oversight by the regulatory agency (FAA) in exchange for obtaining and keeping the certificate. An inspection is usually conducted annually to ensure the airport is in compliance with the certification requirements. When the inspection identifies a condition that needs correction, the airport is notified that corrective action must be taken to prevent loss of the AOC.

Although the nomenclature (certificate, license, etc.) may vary, most non-Part 139 airports, if required to be licensed, are licensed by their state aeronautics agencies per established state standards in order for the airports to be available for public use. State requirements usually address items such as minimum runway size, airfield marking and lighting requirements, maintenance of clear approaches and safety areas on or around the airport, fueling facility safety and airport security requirements. The inspection schedule for airports will again vary on a state-by-state basis.

Small airports that serve scheduled and unscheduled air carrier aircraft with more than 30 seats, or serve scheduled air carrier operations in aircraft with more than 9 seats but fewer than 31 seats, are certificated by the FAA under FAR Part 139: Certification of Airports. Additional Part 139 certification information is also on the FAA's airport certification web page.

## Part 139 Operating Certificate


The AOC is categorized into four airport certificate classes based on the type of air carrier operations anticipated at the airport. The certificated airports are categorized as:

- Class I airport: An airport certificated to serve scheduled operations of large air carrier aircraft (31 seats or more) that can also serve unscheduled passenger operations of large air carrier aircraft, scheduled operations of small air carrier aircraft or both.
- Class II airport: An airport certificated to serve scheduled operations of small air carrier aircraft (fewer than 31 seats) and the unscheduled passenger operations of large air carrier aircraft. A Class II airport cannot serve scheduled large air carrier aircraft.
- Class III airport: An airport certificated to serve scheduled operations of small air carrier aircraft. A Class III airport cannot serve scheduled or unscheduled large air carrier aircraft.
- Class IV airport: An airport certificated to serve unscheduled passenger operations of large air carrier aircraft. A Class IV airport cannot serve scheduled large or small air carrier aircraft.

## Part 139 Compliance Requirements


An AOC issued by the FAA in accordance with Part 139 is effective until the certificate holder surrenders the certificate or it is revoked by the FAA administrator. The certification process was put in place to ensure safety in air transportation and involves an inspection of the airport for compliance with the certification requirements and the retention of required records. The ACM details how the airport operator will comply with the requirements of Part 139 and is defined in 14 CFR §139.203. The airport operator prepares the ACM, and the FAA reviews and approves it. The ACM can be amended by the airport or upon request by the FAA.

An airport operator must demonstrate that its airport meets the standards of one of the Part 139 certification classes in order to be considered for Part 139 certification. If the FAA concurs that the operations at the airport require Part 139 certification, the airport operator must demonstrate the airport will meet the requirement through the preparation of the ACM and procedures outlined in that manual.

For Class I, II and III airports, the ACM contains 29 elements, as described in FAA Advisory Circular 150/5210-22: Airport Certification Manual:

1. Lines of succession of airport operational responsibility
2. Each current exemption from the requirements of Part 139 that has been issued to the airport
3. Any limitations imposed by the administrator
4. A grid map or other means of identifying locations and terrain features on and around the airport that are significant to emergency operations
5. The location of each obstruction required to be lighted or marked within the airport's area of authority
6. A description of each road and each movement area, including its safety areas, available for air carriers
7. Procedures for avoidance of interruption or failure during construction work of utilities serving facilities or NAVAIDs that support air carrier operations
8. A description of the system for maintaining records
9. A description of personnel training
10. Procedures for maintaining the paved areas
11. Procedures for maintaining the unpaved areas
12. Procedures for maintaining the safety areas

13. A plan showing the runway and taxiway identification system, including the location and inscription of signs, runway markings and holding-position markings
14. A description of, and procedures for maintaining, the marking, signs and lighting systems
15. A snow and ice control plan (or note that it is not required, as in a warm climate)
16. A description of the facilities, equipment, personnel and procedures for meeting the ARFF requirements
17. A description of any approved exemption to ARFF requirements
18. Procedures for protecting persons and property during the storing, dispensing and handling of fuel and other hazardous substances and materials
19. A description of, and procedures for maintaining, the traffic and wind direction indicators
20. An emergency plan
21. Procedures for conducting the self-inspection program
22. Procedures for controlling pedestrians and ground vehicles in movement areas and safety areas
23. Procedures for obstruction removal, marking or lighting
24. Procedures for protection of NAVAIDs
25. A description of public protection
26. Procedures for wildlife hazard management
27. Procedures for airport condition reporting
28. Procedures for identifying, marking and lighting construction and other unserviceable areas
29. Any other item that the administrator finds is necessary to ensure safety in air transportation

Class IV airports are exempt from some of the requirements.

An FAA certification inspector typically conducts an annual inspection to ensure the airport is complying with the ACM. The FAA can also make unannounced inspections. If the FAA identifies any issues during its inspection, it issues a corrective letter, and the airport must correct the situation.

Good record organization and retention assist in an efficient Part 139 inspection.

An important part of demonstrating compliance is for the airport to complete its self-inspection program as detailed in its ACM. Maintaining the appropriate records that show compliance with inspection, training, accidents or incidents, and condition assessment dissemination (e.g., NOTAMs) is equally important. Training records must be maintained for 24 consecutive calendar months from the completion date of the training. Daily inspection reports and corrective action reports must be maintained for 12 consecutive calendar months. NOTAMs issued and canceled should be maintained for 24 months. Fuel system and fuel delivery vehicle inspection reports must be retained for 36 months. Aviation organizations that support airport management offer training regarding accurate document management and other Part 139 certification requirements. An airport's FAA certification inspector can also be a helpful resource.

The annual inspection will include a physical inspection of the airfield, aircraft rescue and firefighting response as well as record inspections. The annual Part 139 inspection typically includes the following:

- Preinspection in-briefing with airport management. During this meeting, an inspection schedule and meetings with applicable airport personnel will be agreed on.
- Administrative inspection of airport files, paperwork, etc. This includes updating the Airport Master Record (FAA Form 5010) and review of the ACM; NOTAMs issued and cancelled; the airfield self-inspection forms, including corrective actions for discrepancies; and fuel facilities' quarterly inspection reports including training inspection records, such as for driver training or self-inspection.
- Movement area inspection: This will include a check of the approach slopes of each runway end; an inspection of the movement areas in order to ascertain the condition of pavement,

markings, lighting, signs, and abutting shoulders and safety areas; observation of ground vehicle operations; ensuring the public is protected against inadvertent entry and jet or propeller blast; a visual check for the presence of any wildlife; and inspection of the traffic and wind direction indicators.

- Aircraft rescue and firefighting inspection: A timed response drill will be conducted with a review of ARFF personnel training records, including the annual live-fire drill and documentation of basic emergency medical care training, as required. Equipment and protective clothing will be checked for operation, condition and availability.
- Fueling facilities inspection: This will consist of conducting an inspection of all fuel farm facilities and mobile fuelers, a check of airport files for documentation of quarterly inspections of the fueling facility and a review of certifications from each tenant fueling agent concerning completion of fire safety and line service training.
- Night inspection: Conducted to evaluate runway, taxiway and apron lighting, signage, pavement marking, airport beacon, wind-cone condition and lighting and obstruction lighting for compliance with FAR Part 139 and the ACM. A night inspection shall be conducted if air carrier operations are conducted or expected to be conducted at night or the airport has an instrument approach.
- Post-inspection briefing with airport management: At the end of the inspection, the inspector will meet with appropriate airport staff to discuss findings and provide any safety recommendations. The inspector will issue a letter of correction that notes any violations or discrepancies. If any are found, airport staff and the FAA will agree on a reasonable date for the correction of those discrepancies or violations.

## 4.17 Customs Service

### Key Insights

*Where present, the most common type of U.S. Customs and Border Protection service at small airports is user-fee service, in which user fees should be set to cover the cost of the service.*

*For aircraft entering the United States, if the destination airport does not offer customs service, the aircraft must first arrive at an airport with customs service and be cleared before continuing as a domestic flight to its final destination.*

*Ongoing, sufficient demand for customs service and customers willing to pay the fees is essential before investing the time, effort and money to pursue offering customs clearance services on a user-fee basis.*

### Key Definitions

**Port of entry**: An official location where U.S. Customs and Border Protection officers or employees are assigned to accept entries of merchandise and passengers, collect duties and enforce the provision of the U.S. Customs and Border Protection and related laws.

**U.S. Customs and Border Protection (CBP)**: A federal law enforcement agency that regulates and facilitates international trade, collecting import duties and enforcing U.S. regulations, including trade, customs and immigration.

**User-fee airports (UFAs)**: Small airports approved by a commissioner of the U.S. Customs and Border Protection to receive, for a fee, the service of a U.S. Customs and Border Protection officer for the processing of aircraft, their passengers and cargo entering the United States.

### Customs Service for International Arrivals

All international arriving passengers, whether on a commercial service aircraft, GA aircraft or using other modes of transportation, must go through customs at a United States port of entry. At the port of entry, any material brought into the United States is declared, personal identification is verified through the inspection of passports and luggage is inspected and searched, if appropriate. The aircraft is also inspected and must be cleared. Materials not permitted, especially agricultural products, are confiscated and disposed of according to regulations. Even trash from aircraft is disposed of as special waste.

At small airports with frequent international operations, typically by corporate operators, the airport may desire to make the U.S. customs service available to make the airport more attractive to aircraft operators and enhance the level of customer service at the airport. There are two types of CBP service: port of entry and UFAs, as detailed on the CBP website. The most frequently available CBP service at small airports is user fee based.

### UFA Qualifications

As detailed on the CBP website, four criteria must be met for UFA consideration:

- The volume or value of business at the airport is insufficient to justify the availability of inspection services at the airport on a nonreimbursable basis.
- The current governor of the state in which the airport is located supports the designation in writing to the CBP commissioner.

- The requestor (e.g., airport authority) agrees to reimburse CBP for all costs associated with the services, including the expenses of staffing a minimum of one full-time inspector.
- The requestor completes an agriculture compliance agreement with FBOs and garbage haulers for handling the international garbage.

If the volume or value of international business is insufficient to justify the availability of inspection services on a nonreimbursable basis, a small airport in need of customs service can apply to be considered for inclusion in the UFA program. When considering becoming a UFA, it is recommended the airport operator survey anticipated users to determine the anticipated demand for CBP services. While the provision of CBP services is typically undertaken as a customer service initiative, the airport operator is ultimately responsible for the cost, so it is important to find out if there is sufficient activity to cover at least most, or all, of the operating costs. It is typically also needed to justify the investment in an approved inspection facility for the CBP. If there is sufficient need for the UFA, the next step is to obtain support of the state's governor. The user survey data demonstrating the need for CBP services can help in making this request.

As further detailed on the CBP website, when the UFA application is being considered, the following will occur:

1. Receipt of letter from the state's governor supporting UFA designation
2. Initial site visit, during which a CBP official discusses workload and services
3. Development of facilities per CBP requirements (by the airport operator or designee)
4. A final site visit, during which the CBP official verifies that facilities are 85 percent complete and adequate for inspection services to be provided
5. A successful site visit, during which the CBP official discusses workload and services and verifies that facilities are adequate for inspection services to be provided
6. Completed MOA with CBP, which states the responsibilities, fees and hours of service

CBP must have available staff, or authorization and budget appropriation to hire additional staffing, before considering new ports of entry or UFAs. Generally, a UFA will pay a flat fee to CBP and be reimbursed by users. Overtime costs for arrivals outside normal CBP hours will incur, and additional costs passed along to the user should be in the set fee schedule.

The development of facilities to meet CBP requirements can be a significant cost and should be carefully considered before pursuing UFA designation. Some small airports that are already operating as a UFA are being required to upgrade their facilities. The airport operator must provide CBP with a suitable facility at no charge to the federal government. At a minimum, the primary elements in a UFA facility include space for passenger waiting (pre- and post-entry) and processing, an office, a computer/communications room, a storage room, an interview room, a search room, a hold room, an agricultural quarantine inspection area, public toilets and entry and exit vestibules. The number of passengers processed per hour is used to determine the size of elements for a CBP facility. There also must be a dedicated apron area appropriately marked to avoid unauthorized entries or contact with persons or objects. Within the elements of the CBP, there are very specific requirements for the types of materials used, such a specific types of finishes, windows, locks, hinges, etc.

While the airport operator is ultimately responsible for the CBP fees, UFAs generally establish a fee schedule for the users of the service to cover the CBP costs. The fee schedule is usually tied to aircraft size, with additional overtime charges, if applicable. After establishing the fees, a UFA needs to periodically review its fees against the CBP costs to the airport and activity levels. At small airports offering customs service, it is beneficial to publish the current UFA fee levels so that arriving aircraft know the costs in advance. This information can be included on the airport's website. The website can also include information regarding scheduling the customs service.

## 4.18 Joint-Use Airports

### Key Insights

*Joint use of an airport is when there are civilian and military operational components based at the airport.*

*The federal government has the right to use airport facilities without charge, except in cases of substantial use. When there is substantial use, the federal government can contribute a reasonable share of the cost of maintaining and operating the landing area in proportion to such use.*

### Key Definitions

**Airport joint-use agreement**: An agreement between a military unit and a civilian airport that delineates responsibility and outlines payment arrangements.

**Fair market value (FMV)**: An estimate of the market value of a property, based on what a knowledgeable, willing and unpressured buyer would probably pay to a knowledgeable, willing and unpressured seller in the market.

**Joint-use airport**: An airport owned by the Department of Defense, at which military and civilian aircraft make shared use of the airfield (FAR §139.5). This term may also be used to refer to the mixed military and civilian use of a civilian airport.

**Joint-use areas**: The areas of a civilian airport that are used by civilian and military aircraft. This is generally limited to runways and taxiways.

**Substantial use**: A situation in which a military unit has a significant enough impact on a civilian airport that reimbursement for operations and maintenance costs is warranted.

### Joint-Use Considerations

Joint-use airports can benefit the governmental entity and the civilian entity through more economical operations by sharing facilities. While the governmental entity is commonly a National Guard or Reserve unit, it can be any federal department or agency. When there is a military tenant on a civilian airport, the airport operator must be aware of any unique needs for protection of military assets, such as setbacks to facilities. These special requirements should be considered and included in all planning for the airport. This can be accomplished by including the military tenant as a key stakeholder in the planning process.

FAA Grant Assurance 27: Use by Government Aircraft requires an airport that has received federal funding to be available to the federal government for the landing and takeoff of aircraft at all times without charge, unless it is substantial use. Unless agreed to otherwise, substantial use is, as defined by Grant Assurance 27, as follows:

a) Five or more government aircraft are regularly based at the airport or on land adjacent thereto; or
b) The total number of movements (counting each landing as a movement) of government aircraft is 300 or more, or the gross accumulative weight of government aircraft using the airport (the total movement of government aircraft multiplied by gross weights of such aircraft) is in excess of 5 million pounds.

**Grant Assurance 27: Use by Government Aircraft**

[The airport sponsor] will make available all of the facilities of the airport developed with federal financial assistance and all those usable for landing and takeoff of aircraft to the United States for use by government aircraft in common with other aircraft at all times without charge, except, if the use by government aircraft is substantial, charge may be made for a reasonable share, proportional to such use, for the cost of operating and maintaining the facilities used.

The Surplus Property Act, under both the War Assets Administration Regulation 16 and Surplus Airport Property Instruments of Transfer (Public Law 80-289), also grants the United States the right to make nonexclusive use of the landing area of the airport without charge.

At joint-use airports, federal grant assurances do not apply to areas within exclusive Department of Defense control.

While the U.S. government is granted the right to use the landing area without charge, it can still be a tenant at the airport. Under the AIP, there is no requirement for free rent, except for specifically named federal government infrastructure, such as ATCT and NAVAIDs, and some other federal agencies, such as CBP. While FAA Grant Assurance 24: Fee and Rental Structure requires an airport to be as self-sustaining as possible and Grant Assurance 22: Economic Nondiscrimination requires the airport to be available for public use on reasonable terms without unjust discrimination, rental rates to the military do not need to be FMV, because they are considered part of the nation's defense system. While the military may not pay fair market value, its presence at an airport typically adds value to an airport or for the community. At some small airports, the military entity provides the ARFF or ATC services that, while focused on the military operations, also benefit civilian users.

In cases where the airport sponsor proposes to charge the federal government to use the airport under the joint-use provision, the sponsor must negotiate an airport joint-use agreement. The airport sponsor needs to negotiate directly with the federal government agency or agencies using the airport. The FAA does not act as a negotiator but only oversees compliance with Grant Assurance 27. FAA Order 5190.6: Airport Compliance Manual's Appendix J-1: Airport Joint-Use Agreement for Military Use of Civilian Airfields contains guidance for negotiating fair and reasonable charges to the government for the joint use of the public airport's flying facilities.

## Part 139 Certification


At joint-use airports owned by the U.S. government with civilian commercial or charter operations, the civilian entity must obtain a Part 139 certificate and comply with Part 139 requirements for all elements of the airport it is responsible for operating. The FAA's website on Part 139 certification at U.S. government-owned airports provides additional details on how Part 139 regulations are applied in these situations.

At joint-use airports, federal grant assurances do not apply to areas within exclusive Department of Defense control.

## Grants

### *Airport Improvement Program*

A civilian-owned airport with joint use is still eligible for AIP grants, as described in Section 3.10: Grant and Capital Improvement Funding. While military and federally owned aircraft may not be counted toward critical aircraft annual operations for AIP funding, for infrastructure used by the military unit, there may be opportunities to receive financial support from the military. This should be coordinated through the military tenant.

### *Military Airport Program*

The FAA also has a program to assist former military airports in transitioning to civilian ownership and use. These facilities may continue to have a military unit present at the airport, but the ownership of the airport transitions from the Department of Defense to a local civilian airport sponsor.

Within the AIP is a military airport set-aside. The purpose of this funding is to assist a civilian sponsor of a military airfield in the conversion and development of aviation facilities for the public. A maximum of 15 airports per fiscal year may participate in the AIP Military Airport Program. Each airport can participate for a maximum term of 5 years. The airports in the Military Airport Program can include up to three GA airports per year. Additional details are provided on the FAA's Military Airport Program web page.

CHAPTER 5

# Asset Management—Maintaining Current Assets and Planning Development for the Future

Icons are defined in Figure 1 of Section 1.1.

Practicing asset management is important for an airport to realize the full value of existing assets and to develop future assets in the most economical manner. This section addresses the process and analysis that can be used to maximize the value of existing assets. This philosophy aligns with the broad FAA goal to preserve the investment in existing infrastructure. Further, this section addresses the various tools an airport can use to plan for and pursue development to meet the future needs of its users.

## 5.1 Maintaining Existing Assets

### Key Insights

*There are three primary types of maintenance at small airports: operational, reactive and preventive.*

*After safety and security, the preservation of assets is the next highest priority in the FAA Airport Improvement Program funding priority system.*

*A local airport sponsor is required to properly maintain airport pavement assets after the FAA invests grant funds; the pavement management program is a key part of this requirement.*

*An important part of managing assets is knowing their expected useful life, which allows the airport to budget for maintenance and replacement costs.*

*A sound preventive maintenance program is critical for extending the useful life of airport facilities and to keep the airport operating as safely and efficiently as possible. Not employing a preventive maintenance program will almost certainly result in the premature failure of infrastructure and additional life-cycle costs.*

*While the FAA requires asset management programs for the civil infrastructure that it invests in, it is a best practice for airports of all sizes to implement a similar program for all of their other infrastructure.*

### Key Definitions

**Operational maintenance**: Activities performed to keep an airport operating due to weather or environmental conditions, such as snow and foreign object debris removal.

**Pavement management program**: Also referred to as pavement maintenance management program or pavement management system. Procedures for collecting, analyzing, maintaining

**AREAS TO BE MAINTAINED**

- Airfield electrical
  - Airfield signs
  - Airfield visual and navigational aids
  - Runway and taxiway lights
  - Apron lighting
  - Electrical vault
- Airfield pavements
  - Pavement condition
  - Markings
  - Safety areas
- Buildings
  - Hangars
  - Terminal/administration/office
  - Maintenance and storage buildings
- Fuel farm
- Deicing facilities
- Landside infrastructure
  - Roadways
  - Landscaping
  - Lighting
- Maintenance equipment and vehicles
  - Tractors and mowers
  - Fuel delivery vehicles
  - Ops and admin vehicles
- Fencing
- Cameras
- Access control
  - Fence
  - Gates
- Drainage systems
- Obstructions

and reporting pavement data to assist airport management in finding optimum strategies for maintaining pavements in a safe, serviceable condition over a given period of time for the least cost.

**Preventive maintenance**: Actions performed to detect, preclude or mitigate the failure of the infrastructure system or its components, including routine scheduled activities, to keep a system performing at its best.

**Reactive maintenance**: Fixing something after it breaks.

**Total cost of ownership**: Includes the cost to procure and construct a physical asset and the long-term cost to operate and maintain the asset.

## Asset Management

Asset management involves planning the maintenance of existing assets and planning for future development. This allows both maintenance and future development to be taken into account to maximize the life of the assets and plan investments in the assets. It is important for airport management to be familiar with the airport's infrastructure systems, their components, conditions and expected life spans before failure. Strong asset management supports fiscal sustainability by proactively addressing needs when they are generally more economical.

The first priority for an airport should be to maintain its assets to provide maximum safety and utility for its users. As identified in *ACRP Report 138: Preventive Maintenance at General Aviation Airports, Volume 1: Primer*, preventive maintenance benefits include the following:

- Maintaining safe operating conditions
- Reducing energy use by operating efficiently
- Increasing longevity of the system
- Meeting legal and regulatory requirements
- Controlling environmental impacts
- Providing a good first impression as a "front door" for the community

## Establishing a Preventive Maintenance Program

Use *ACRP Report 138, Volume 2: Guidebook* and *ACRP Report 159: Pavement Maintenance Guidelines for General Aviation Airport Management* to develop a program for preventive maintenance of airport assets.

As identified in *ACRP Report 138, Volume 1*, there are several steps to establish a preventive maintenance program. Before starting the process of implementing a preventive maintenance program, its goals—or guiding principles—should be identified. The next step is the inventory and assessment of the condition of the airport's infrastructure assets and systems. This step allows a preventive maintenance program to be established for each asset and system. The preventive maintenance program should identify the maintenance needed for each type of asset and system and develop a maintenance schedule. The final step is to implement the program.

As part of this program implementation, it may be necessary to prioritize the maintenance based on safety, operations, economics, contractual obligations, accessibility and the opportunity to extend facility useful life. This prioritization process should also consider obtaining the necessary resources, including funding, staffing, equipment tools and/or outside third-party contracts.

Multiple infrastructure systems at an airport must be maintained. Many of these infrastructure systems are the same ones that should be included on the airport inspection checklist. As part of program implementation, the infrastructure systems should be inspected on a regular basis to ensure the identified preventive maintenance is being accomplished and the condition of the system is as expected. Chapter 4 of *ACRP Report 138, Volume 2* provides safety considerations, airport inspection checklists and an infrastructure checklist for the major categories of infrastructure at GA airports.

Maintaining lighting systems requires special consideration due to the system's high voltage.

## Prioritizing Preventive Maintenance

All small airports operate on a budget, which typically requires that preventive maintenance activities be prioritized. As identified in *ACRP Report 138, Volume 1*, a recommended prioritization is as follows:

1. Safety: Always a top priority. Regular inspection and maintenance should ensure the airport infrastructure is safe for pilots and other users. When its condition is changed, it must be reported via a Notice to Airmen (NOTAM).
2. Operations: Focus on the most critical asset first. Prioritize the runway or primary runway before lesser-used pavements.
3. Economics: Evaluate the cost that may be incurred if preventive maintenance is delayed. Will delaying the item in question result in other damage?
4. Contractual obligation: Is there a lease requirement that must be met, such as repairing a door for access to a hangar, or a federal or state grant obligation that must be met for continued grant funding?
5. Accessibility: The access to the airport must be maintained to be usable. This would include access roads and car parking areas.
6. Other: Other considerations might include a higher operational priority access for a significant tenant that is a frequent operator. Are there excess pavements, such as unused aprons, that could be abandoned so that available funds can be focused on higher priorities?

## Resources for Preventive Maintenance

The most common resource for preventive maintenance, especially routine maintenance, is in-house staff. These staff members should be trained to become familiar with the airport infrastructure and its maintenance needs. They are also typically able to recognize when reactive maintenance is needed because of an immediate issue.

In addition to using in-house staff, using department skilled staff of the sponsoring governmental agency to assist with some of the preventive maintenance should also be explored. Because the sponsoring governmental agency is typically a larger organization, there may be skills available within its staff that are not available with the airport's in-house staff.

Some states also have funding programs that include operational and preventive maintenance activities, including pavement marking and maintenance. The state aeronautics agency should be contacted to determine what resources might be available in your state.

Finally, for nonhub primary airports and nonprimary airports, routine runway, taxiway or apron pavement maintenance is eligible for

### Grant Assurance 11: Pavement Preventive Maintenance

With respect to a project approved after January 1, 1995, for the replacement or reconstruction of pavement at the airport, [the airport sponsor] assures or certifies that it has implemented an effective airport pavement maintenance-management program and it assures that it will use such program for the useful life of any pavement constructed, reconstructed or repaired with federal financial assistance at the airport. It will provide such reports on pavement condition and pavement management programs as the Secretary determines may be useful.

AIP grants, as identified on Table 3-2 of FAA Order 5100.38: Airport Improvement Program Handbook. Typical pavement maintenance is defined as including clearing, filling and/or sealing of longitudinal and traverse cracks, grading pavement edges, maintaining pavement drainage systems, patching pavement and remarking areas. Pavement maintenance is discussed in more detail in Section 5.2: Pavement Maintenance.

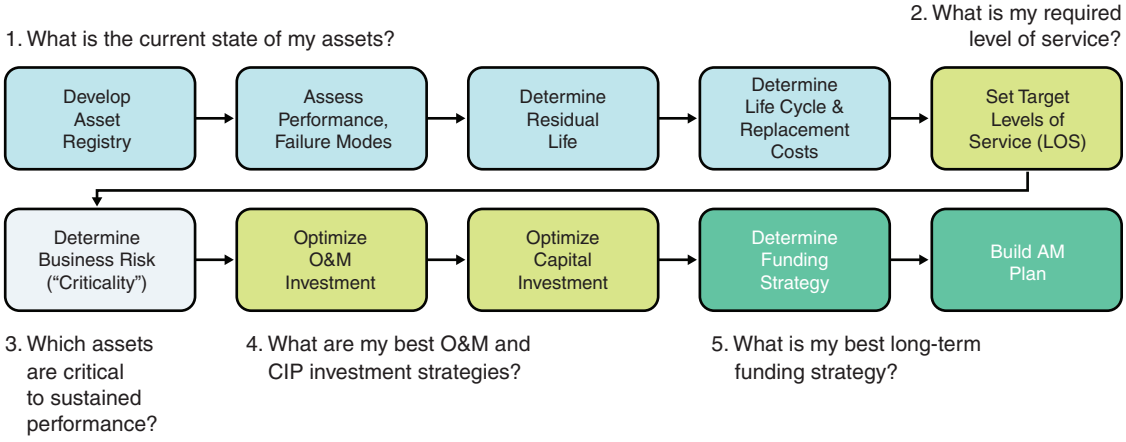
### *Records of Preventive Maintenance*

Maintaining records of preventive maintenance activities helps budget for such activities and justifies the budget for future preventive maintenance activities. These preventive maintenance records also help demonstrate efforts to preserve assets when requesting AIP grants. Of particular importance are records of pavement maintenance activities to demonstrate compliance with FAA Grant Assurance 11: Pavement Preventive Maintenance, which requires that the airport implement an effective pavement maintenance management program.

## Asset Management

The establishment and use of asset management tools take preventive maintenance programs a step further. Asset management programs or systems incorporate additional considerations of down-time risk and align the potential risk costs with enterprise goals when prioritizing preventive maintenance. Complex asset management systems are more commonly used by larger airports. *ACRP Report 69: Asset and Infrastructure Management for Airports—Primer and Guidebook* provides an overview of asset and infrastructure management and explores the benefits and costs of implementation. Also available with *ACRP Report 69* is a Microsoft PowerPoint presentation on the benefits of an asset management program.

A tool that may help small airports is the EPA's core asset management questions. These five questions frame the 10-step approach (Figure 11) to developing an asset management plan. The ultimate goal of asset management is to lower total ownership costs by making better proactive decisions.




O&M = operations and maintenance, CIP = capital improvement program, AM = asset management
Source: *ACRP Report 69: Asset and Infrastructure Management for Airports—Primer and Guidebook*, 2012

***Figure 11. EPA's core questions in a 10-step approach to developing asset management plans.***

## 5.2 Pavement Maintenance

### Key Insights

*Keeping water out of pavements is the key to maximizing their useful life.*

*Maintaining pavements not only extends their useful life but reduces the total ownership cost of pavements due to the slower degradation of the asset.*

*A pavement management program is a requirement for federally obligated airports (those that accept Airport Improvement Program grants) under Grant Assurance 11: Pavement Preventive Maintenance.*

### Key Definitions

**Aircraft classification number**: A number that expresses the relative effect of an aircraft at a given configuration on a pavement strut for a specified subgrade.

**Acceptable minimum level of service**: Minimum acceptable pavement condition index rating for a category of pavement, such as a general aviation runway.

**Full-depth reclamation (FDR)**: The full thickness of the asphalt pavement and a predetermined portion of the base, subbase and subgrade is uniformly pulverized and blended to provide a homogenous material.

**Pavement condition index (PCI)**: A numerical rating of the pavement condition based on a visual observation of distresses.

**Pavement classification number**: A number that expresses the load-carrying capacity of a pavement for unrestricted operations.

**Pavement management program**: Also referred to as pavement maintenance management program or pavement management system. Procedures for collecting, analyzing, maintaining and reporting pavement data to assist airport management in finding optimum strategies for maintaining pavements in a safe, serviceable condition over a given period of time for the least cost.

**Pavement reconstruction**: May be necessary in situations when there is no redeemable pavement life (rehabilitation is not a viable option), corrections are needed in the subgrade, there are changes to geometrics or there is an increase in traffic volume.

**Pavement rehabilitation**: Techniques include overlays and full-depth reclamation.

**Pavement routine maintenance**: Maintenance required to preserve the pavement to achieve the design life and that is planned and performed on a routine basis, such as yearly crack sealing and a regular inspection of the pavements.

**Grant Assurance 11: Pavement Preventive Maintenance**

With respect to a project approved after January 1, 1995, for the replacement or reconstruction of pavement at the airport, [the airport sponsor] assures or certifies that it has implemented an effective airport pavement maintenance-management program and it assures that it will use such program for the useful life of any pavement constructed, reconstructed or repaired with federal financial assistance at the airport. It will provide such reports on pavement condition and pavement management programs as the Secretary determines may be useful.

### Pavement Management Program

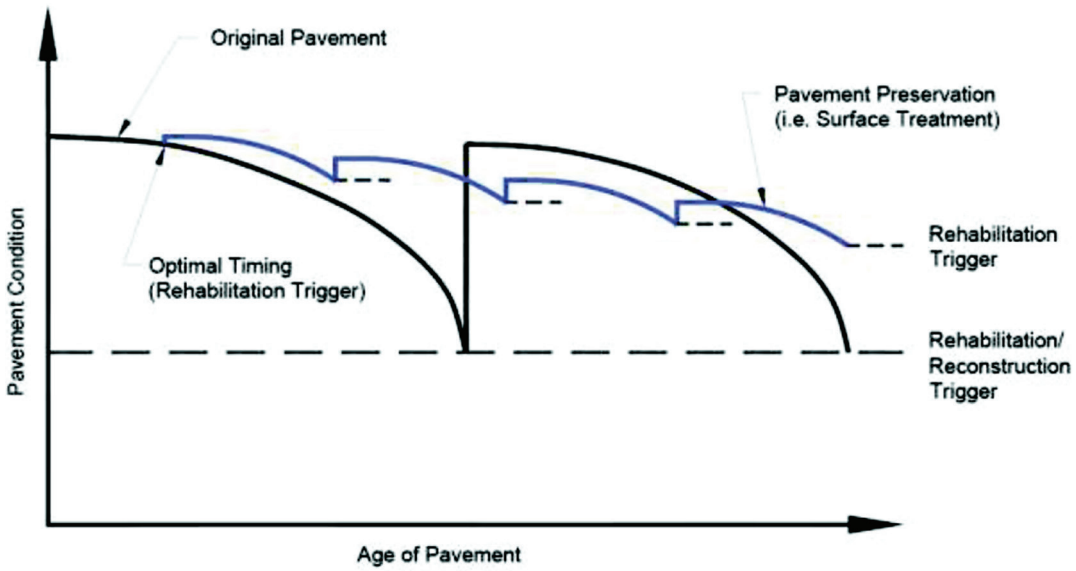
Any small airport that accepts an AIP grant from the FAA is required to implement an airport pavement maintenance or management program.

Some states conduct pavement condition studies at the nonprimary airports in the state system and prepare a management plan as part of that study. Contact your state aeronautics agency to determine if there is such a program in your state. FAA Advisory Circular 150/5380-7: Airport Pavement Management Program provides guidance on pavement management.

Preventive maintenance preserves the pavement at a higher overall condition over a longer period of time by applying maintenance and rehabilitation early in the pavement life, as shown in Figure 12. An effective pavement maintenance program addresses pavement needs while the pavements are still in good condition before serious damage occurs, thus extending their life. In addition, to be more economical throughout the pavement useful life, performing a series of periodic pavement preservation interventions is generally less disruptive to users than long closures for large reconstruction projects.

There are several common types of pavement distress in asphalt and concrete pavements. Some of the most common types of distresses in asphalt pavements at small airports are longitudinal and traverse cracking, edge cracking, alligator or fatigue cracking, block cracking, raveling and weathering, patching, roughness and joint reflection (in asphalt overlay of concrete pavement). In concrete pavements, the most common types of distresses are longitudinal and traverse cracks, spalling, corner breaks, pop-outs, joint sealant damage, patching, settlement and shattered slabs. While some distresses may be due to loads, most are influenced by environmental factors, such as the presence of water and freeze–thaw cycles in areas of the country where temperatures drop below freezing.

*ACRP Report 159: Pavement Maintenance Guidelines for General Aviation Airport Management* provides small airports a tool to help identify pavement distress and the appropriate pavement management or maintenance technique. This report also includes an airport pavement maintenance recommendation tool and field guide. The tool is interactive and allows an airport operator to evaluate potential maintenance options. The field guide is designed to be used with the tool for field identification. The field guide includes photographs to help identify the severity of distress. Appendix A of *ACRP Report 159* also includes pictures and distress information on asphalt pavement, and Appendix B addresses concrete pavements. Based on the distress, it




Source: FAA Advisory Circular 150/5380-7B, Airport Pavement Management Program, Figure 2, October 10, 2014.

***Figure 12. Pavement preservation concept.***

identifies acceptable and recommended maintenance activities. *ACRP Synthesis 22: Common Airport Pavement Maintenance Practices* provides a catalog of maintenance options.

For nonhub primary airports and nonprimary airports, pavement maintenance is one type of airport maintenance activity that is eligible for AIP grants, as identified in Table 3-2 of FAA Order 5100.38. The FAA Airports Central Region has a web page on pavement maintenance that includes a sample pavement maintenance program.

## Pavement Inspections

The goal of pavement maintenance is to keep water out of the pavement to prolong its useful life.

The airport operator should conduct routine pavement inspections to be familiar with the pavement's condition and to be able to identify any changes. Pavement conditions should always be assessed as part of regular inspections to identify any significant changes. However, the best time to conduct detailed pavement inspections is when there is a little moisture. After precipitation and as pavements are drying, defects such as cracks dry out after the other pavement sections, making them easier to see and identify. This allows defects to be identified sooner, so they can be addressed sooner, thus minimizing any damage to the overall pavement.

While surface distress is a critical indicator of pavement condition, there are other conditions that should be considered:

- Surface friction
- Roughness or ride quality
- Foreign object debris
- Structural integrity, especially if the pavement regularly experiences operations by larger aircraft

Good record keeping is important. In addition to helping with future budgeting, records of pavement inspection and pavement maintenance help an airport demonstrate compliance with Grant Assurance 11.

The recorder should include the following:

- Inspection date
- Location
- Distress types found
- Any maintenance performed or scheduled

## Pavement Condition Index

PCI is a frequently used method to evaluate pavement conditions. The pavements are divided into subareas, and the distress types and quantities are evaluated to correlate to a PCI rating. A PCI rating of 100 is associated with a new pavement; the ratings decrease as the pavement ages and distresses occur. As part of a pavement management program, airports or state aeronautics agencies may establish minimum acceptable PCI ratings. These typically differ by pavement type, with runways having higher minimum threshold levels than taxiways or aprons. PCI ratings may also be used to help document the need for a rehabilitation project or used by agencies to prioritize an airport rehabilitation project throughout the state. Table 11 shows the PCI ratings for airport pavements, the conditions they represent and the recommended types of treatments.

## Pavement Strength

Pavement strength, or the weight-bearing capacity of airport pavements, has historically been reported based on gross weight and main gear configuration, such as 12,500 pounds single wheel.

**Table 11. Pavement condition index for airport pavements.**

| PCI | Description | Applicable Pavement Preservation Treatments |
|---|---|---|
| 86–100 | Good – only minor distresses | Routine maintenance only |
| 71–85 | Satisfactory – low and medium distresses | Preventive maintenance |
| 56–70 | Fair – some distresses are severe | Corrective maintenance and rehabilitation |
| 41–55 | Poor – severity of some distresses can cause operational problems | Rehabilitation or reconstruction |
| 26–40 | Very poor – severe distresses cause operational restrictions | Rehabilitation and reconstruction |
| 11–25 | Serious – many severe distresses cause operational restrictions | Immediate repairs and reconstruction |
| 1–10 | Failed – pavement deterioration prevents safe aircraft operations | Reconstruction |

Source: *ACRP Synthesis 22: Common Airport Pavement Maintenance Practices*, Table 1, 2011

To align with ICAO standards, the FAA is also using the aircraft classification number–pavement classification number (ACN-PCN) method, as detailed in FAA Advisory Circular 150/5335-5: Standardized Method of Reporting Airport Pavement Strength – PCN. This advisory circular was published in August 2014, and the FAA required that within 1 year of publication, all public-use paved runways at Part 139 airports be assigned gross weight and PCN data. The FAA recommends using the PCN methods outlined in the advisory circular for reporting the pavement strength of all paved runways, taxiways and aprons at all airports. Also, upon completion of projects funded through the AIP or revenue for a PFC project, the airport will update the Form 5010 elements associated with gross weight and PCN.

## 5.3 Airport Planning

### Key Insights

*Airport planning is needed to establish the long-term vision for an airport, or a system of airports, and to provide a strategy for achieving that vision. Airport planning can include a wide variety of studies. The most common for small airports are the airport master plan and airport layout plan. An airport may also be part of a state or regional system plan.*

*A master plan or airport layout plan is a tool for the airport manager to guide development.*

*The complexity of the master plan or airport layout plan should always match the airport's needs.*

*The preparation of a master plan or airport layout plan, with a narrative report for new development, is eligible for AIP grant funding.*

*At a small airport, the operations by the critical aircraft, not the total operations, generally set the dimensional requirements for the airport.*

*At a National Plan of Integrated Airport Systems airport, grant assurances require the airport layout plan to be kept up to date.*

### Key Definitions

**Airports Geographic Information System (Airports GIS)**: The FAA's system of collecting and compiling airport and aeronautical data.

**Airport layout plan (ALP)**: A set of drawings that provide a graphic representation of the sponsor's long-term development plan for an airport, including property boundaries, existing and proposed airport facilities and structures and the location of existing and proposed nonaeronautical areas.

**Airport master plan (AMP)**: An assembly of appropriate documents and drawings covering the development of a specific airport from a physical, economic, social and political jurisdictional perspective by assessing current and projected demands. The master plan typically has a time frame of 20 years, with short-, intermediate- and long-term goals within that time frame. The airport layout plan is a part of this plan.

**Airport sponsor**: Typically a public agency or tax-supported organization that is authorized to own and operate an airport, obtain funds and property interests and be legally, financially and otherwise able to meet all applicable requirements of laws and regulations. Occasionally, it is a private entity.

**Airport system plan**: Identification of the general location and characteristics of airports within that system, such as a state or region, to meet the air transportation goals of the system under study.

**Critical aircraft**: The most demanding aircraft type or grouping of aircraft with similar characteristics that make regular use of the airport. "Regular use" is 500 annual operations, excluding touch-and-go operations. An operation is a takeoff or landing.

**Instrument flight rules (IFR)**: A set of regulations and procedures permitting qualified and current IFR pilots to penetrate clouds and low-visibility conditions. Aircraft must be equipped with radio and navigation instruments and operate under air traffic control flight plans and clearances. Flights are monitored and traffic is separated by air traffic control.

**Grant Assurance 29: Airport Layout Plan**

a. [The airport sponsor] will keep up to date at all times an airport layout plan of the airport showing
   1) boundaries of the airport and all proposed additions thereto, together with the boundaries of all offsite areas owned or controlled by the sponsor for airport purposes and proposed additions thereto;
   2) the location and nature of all existing and proposed airport facilities and structures (such as runways, taxiways, aprons, terminal buildings, hangars and roads), including all proposed extensions and reductions of existing airport facilities;
   3) the location of all existing and proposed nonaviation areas and of all existing improvements thereon; and
   4) all proposed and existing access points used to taxi aircraft across the airport's property boundary. Such airport layout plans, and each amendment, revision, or modification thereof, shall be subject to the approval of the Secretary which approval shall be evidenced by the signature of a duly authorized representative of the Secretary on the face of the airport layout plan. The sponsor will not make or permit any changes or alterations in the airport or any of its facilities which are not in conformity with the airport layout plan as approved by the Secretary and which might, in the opinion of the Secretary, adversely affect the safety, utility or efficiency of the airport.

b. If a change or alteration in the airport or the facilities is made which the Secretary determines adversely affects the safety, utility, or efficiency of any federally owned, leased, or funded property on or off the airport and which is not in conformity with the airport layout plan as approved by the Secretary, the owner or operator will, if requested by the Secretary, (1) eliminate such adverse effect in a manner approved by the Secretary; or (2) bear all costs of relocating such property (or replacement thereof) to a site acceptable to the Secretary and all costs of restoring such property (or replacement thereof) to the level of safety, utility, efficiency, and cost of operation existing before the unapproved change in the airport or its facilities except in the case of a relocation or replacement of an existing airport facility due to a change in the Secretary's design standards beyond the control of the airport sponsor.

**National Plan of Integrated Airport Systems** (**NPIAS**): Public-use airports considered necessary to provide a safe, efficient and integrated system of airports to meet the needs of United States civil aviation, national defense and the U.S. Postal Service.

## Overview

There are typically four stages to move an idea from a concept to an existing facility at an airport: planning, environmental review, project design and project construction. The first step in the process is planning. For an airport, it typically starts as a master plan. For small airports with less-complex operations, the master plan may take the form of an ALP and narrative report.

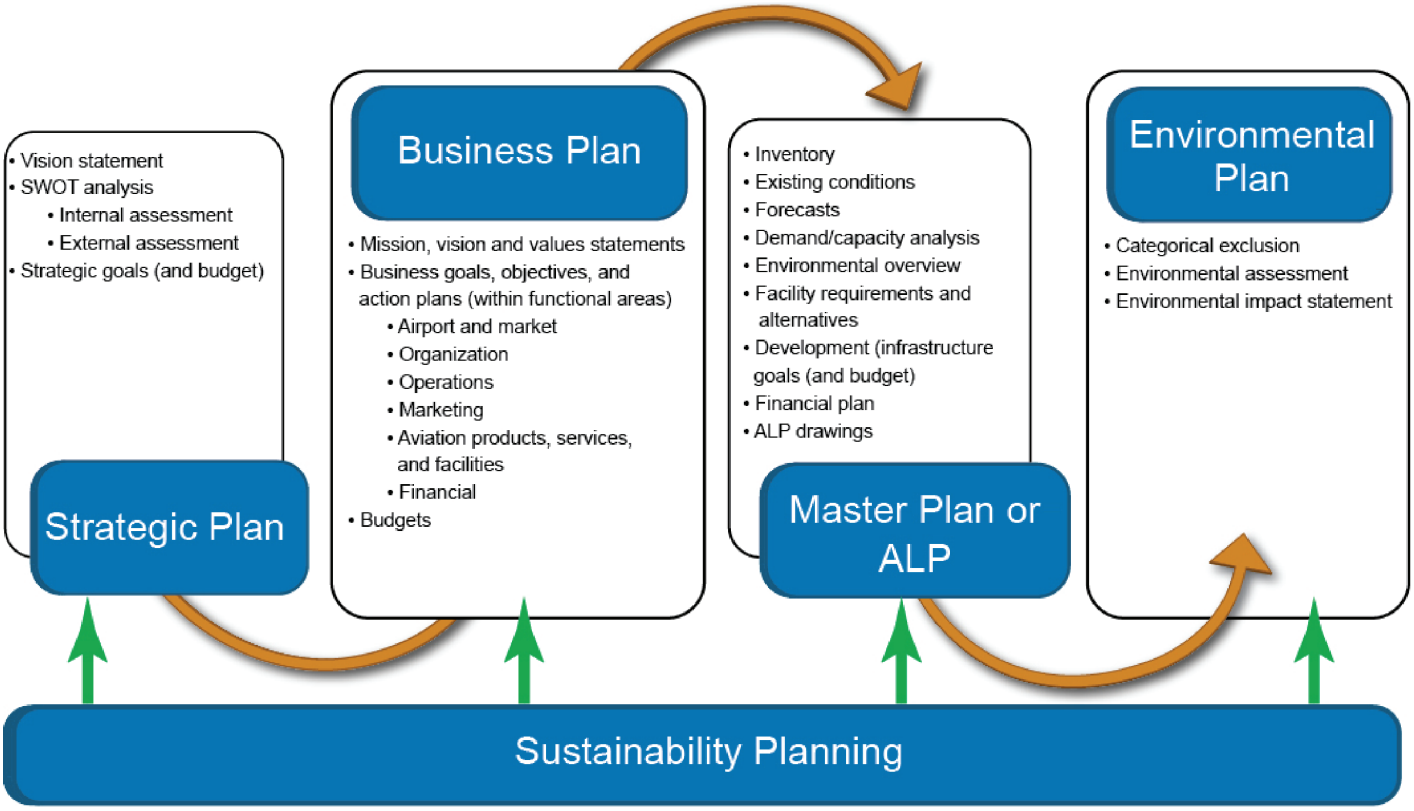



***Figure 13. Relationship of airport planning processes.***

While the AMP or ALP is the most common form of airport planning, it is part of a continuum of planning for airports, as shown in Figure 13. The master plan may be preceded by or may include strategic and business plans. The AMP incorporates, and is commonly followed by, the preparation of environmental documentation for the proposed development. Sustainability should be considered in airport planning. When preparing the master plan, state system plans and any applicable long-range state transportation plans should be taken into account.

## Airport Master Plan

The goal of an AMP or ALP is to establish the vision and provide guidelines for future airport development that will satisfy aviation demand in a financially feasible manner, while addressing the aviation, environmental and socioeconomic issues related to the airport. The master plan or ALP is a tool for the airport manager. The master plan can be used to justify the need for and provide a road map for future improvements. It also serves as a guide to the methodical development of aeronautical and nonaeronautical uses so the airport manager knows where new development can be located. This allows an airport manager to quickly respond when approached about development on the airport while protecting areas reserved for future airfield construction.

**When do you need to update your planning?** (If the answer to one or more of these questions is "yes," then an update is likely needed.)

- Have the types of aircraft using the airport changed since the last plan?
- Has the number of based aircraft or operations exceeded the last forecast?
- Does the current plan include space for future hangar and business development?
- Is a substantial amount of the proposed development on the last plan completed?
- Does the airport own property that will not be needed for aviation development?
- Is the plan more than 20 years old?
- Has the airport acquired additional property?

Most important, the ALP is a tool to obtain an FAA airspace determination and a finding on the safety, utility and efficiency of the proposed development. FAA Standard Operating Procedures 9: FAA Aeronautical Study Coordination and Evaluation identifies the FAA process for all aeronautical or airspace studies.

As identified in FAA Order 5100.38, Chapter 3, Section 5: Project on Airport Layout Plan, this determination is critical before a project can receive FAA grant funding, because a sponsor must demonstrate that an alteration or physical improvement to the airport will not adversely affect the safety, utility and efficiency of the airport. A sponsor can meet this requirement by obtaining an airspace determination and having the project depicted on an approved ALP.

Once the ALP is approved by the FAA, it becomes a "plan on file." All proposed developments submitted to the FAA for airspace review will be compared to the plan on file, including future development. This provides airspace protection for future runways. This airspace protection must also link to state or local zoning or land use controls to protect the airport from encroachment.

The completed master plan or ALP must be shared with the community planning organization. This allows the airport's plans to be integrated into community plans. The ALP can serve as a visual communication tool. During the planning for the airport, it is important to provide the opportunity for the community to participate in the development of the plan.

To protect and promote the airport, the airport's planning documents must be shared with the community and become part of the community's plans.

A master plan or master plan update is eligible for AIP grant funding or reimbursement at an NPIAS airport. An ALP update with a narrative report is grant eligible as a stand-alone planning project, only when new development is being considered—not to keep an ALP current. The update of an ALP after the completion of a construction project should be included as part of the construction project's professional services. On an AIP grant-eligible construction project, this ALP revision is also AIP grant eligible providing it is included in the initial scope of work.

The FAA needs to approve the planning scope of work for planning projects funded with AIP grants. The FAA has established SOPs for ALPs and inventory maps: FAA Standard Operating Procedure 2: FAA Review and Approval of Airport Layout Plans (ALPs) and FAA Standard Operating Procedure 3: FAA Review of Exhibit "A" Airport Property Inventory Maps. When preparing the scope of work for a planning project, these SOPs should be consulted, along with FAA Advisory Circular 150/5070-6: Airport Master Plans. Some states also have an ALP checklist that typically mirrors the FAA Standard Operating Procedure 2 requirements.

As identified in FAA Advisory Circular 150/5070-6, an AMP should meet the following objectives:

- Document the issues the proposed development will address
- Justify the proposed development through the technical, economic and environmental investigation of concepts and alternatives
- Provide effective graphic presentation of the development of the airport and anticipated land uses in the vicinity of the airport
- Establish a realistic schedule for the implementation of the development proposed in the plan, especially the short-term CIP
- Propose an achievable financial plan to support the implementation scheduled
- Provide sufficient project definitions and detail for subsequent environmental evaluation 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 decisions 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 as monitoring key conditions and permit changes in the plan recommendations, as required

The primary elements in a master plan are as follows:

- Pre-planning the initial needs, selecting a consultant and developing a scope-of-work fee and contract
- Public involvement to identify and document the key issues of stakeholders
- Environmental considerations to enable a clear understanding of the environmental requirements to move forward with each project in the recommended development program
- Existing conditions to provide an inventory of pertinent data upon which to base the planning
- Aviation forecasts for short-, medium- and long-term time frames
- Facility requirements to assess the ability of the airport to support the forecast demand
- Alternative development and evaluation to identify options to meet project facility requirements and alternatives for each major component of the airport
- ALP that provides a set of drawings with a graphic representation of the long-term development plan
- Facilities implementation plan to provide a summary of the recommended improvements and associated costs
- Financial feasibility analysis to identify a plan for how the sponsor will finance the project recommended in the master plan

An AMP must be tailored to the airport's needs. At many small airports, an ALP update with narrative report may meet the needs, at a lower cost to prepare. An ALP update is an alternative to a full master plan when the fundamental assumptions of the previous master plan have not changed or when a single development is being examined.

The narrative report accompanying the ALP update must address the following:

- Basic aeronautical forecasts
- Basis for proposed development
- Rationale for an unusual design feature or requests for modifications to FAA design standards
- Summary of the stages of airport development and layout of major items in each stage

The ALP set of drawings will contain, at a minimum, the following:

- Cover (title) sheet
- Data sheet
- ALP drawing (existing and future may be separate sheets, depending on the complexity of the proposed development)
- Terminal area plan
- Inner portion of approach surfaces drawings
- Runway departure surface drawings (unless runways are excluded from instrument departures)
- Airport airspace drawing (Part 77)
- Airport land-use drawing
- Airport property map/Exhibit "A" property map

As an airport becomes more complex, multiple sheets are needed to address each of the ALP drawing categories. Also at more complex airports, additional sheets may be added to the ALP, such as access plans, utility plans and tower line-of-sight drawings. Some states also recommend that airports include farm plans or the limits for various types of crops as part of the airport land-use drawing.

Keep the ALP updated to meet grant assurances—and keep the grant funding flowing.

Chapter 3 in *ACRP Report 113: Guidebook on General Aviation Facility Planning* provides a more detailed summary on airport planning as it relates to GA airports. For a master plan

or ALP, the proposed development should meet the design standards in FAA Advisory Circular 150/5300-13: Airport Design.

## Airports GIS

To support the NextGen navigation system, the FAA has instituted requirements to gather GIS data as part of planning and construction projects that execute changes to facilities. Per the FAA's Airports GIS Transition Policy for Non-Safety Critical Projects, the only airports exempt from preparing a planning project as an Airports GIS project are non-Part 139, nonprimary airports or nontowered, nonprimary airports. However, any survey or data gathering for a planning project will need to meet the survey and data standards for Airports GIS in the following advisory circulars:

- FAA Advisory Circular 150/5300-16: General Guidance and Specifications for Aeronautical Surveys: Establishment of Geodetic Control and Submission to the National Geodetic Survey
- FAA Advisory Circular 150/5300-17: Standards for Using Remote Sensing Technologies in Airport Surveys
- 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.

Even if not required, an airport may elect to prepare a planning project as an Airports GIS project to have the data available for other purposes, such as instrument approach development requests.

Table 2-1 of FAA Advisory Circular 150/5300-18 provides a matrix of survey requirements to help an airport determine the survey data that is required. At airports with a limited budget to build a GIS, building the Airports GIS database over time through grant-eligible projects will be the most cost-effective manner to obtain this data. In addition to delivering the Airports GIS data to the FAA, it should also be delivered to the local community agency that manages GIS.

In addition to sharing the airport's GIS data with the community, you should request to have access to the community's data. The Airports GIS program has specific accuracy requirements for submission. When using data other than that specifically gathered for the airport per the FAA advisory circulars, its accuracy must be checked. Even if community data cannot be submitted to the FAA, it can be useful to the local airport. You should also be familiar with other online mapping tools: community specific, such as property ownership records, and more global mapping or aerial photography information.

## Tracking and Forecasting Aviation Activity

When updating a master plan or ALP for a small airport, you must determine whether operations or critical aircraft, or a combination of both, will drive the planning. This helps indicate the level of effort and focus that will be needed on aviation forecasts as part of the planning process.

If an airport is capacity constrained, a more detailed operations forecast is needed. If the runway is not long enough or another facility is too small, good critical aircraft data and operations by these critical aircraft are needed. For commercial service and more complex small airports, a full forecast is generally needed to provide the driver for the proposed new facilities. For small airports without commercial service, the key forecasting items for planning purposes are based aircraft and operations, including peak-level activity operations. A forecast of instrument operations may also be prepared. *ACRP Synthesis 2: Airport Aviation Activity Forecasting* identifies different types of aviation activity forecasting methods.

### Based Aircraft

The airport sponsor is generally the best source for based-aircraft information, because usually, the management of hangars that house the based aircraft is within the airport sponsor's purview. Occasionally, an FBO or other private entity may own or manage the hangars, but usually the airport sponsor is still responsible for reporting the based aircraft to the FAA. The airport sponsor must keep the FAA's National Based Aircraft Inventory Program updated. This is particularly important when conducting a planning process, because the FAA will compare the forecast to the based-aircraft records contained in the inventory program. NPIAS commercial service, reliever and GA airports can do their updates online at the FAA's National Based Aircraft Inventory Program website. Non-NPIAS and primary airports should update their based-aircraft data via their airport inspectors.

### Operations

At small airports, it is common for the critical aircraft—not total operations—to drive the facility requirements. When total operations is not the driving factor, then deriving the operations forecast from FAA-published resources, including the Terminal Area Forecast (TAF) and national trends that are published in the FAA Aerospace Forecasts, may be an acceptable and more economical forecasting option. The TAF usually includes only a flat trend line future forecast for nontowered airports. Thus, applying projected growth trends from the FAA Aerospace Forecasts to the TAF historical records may be necessary to develop a more realistic forecast.

If detailed operations counts are needed at nontowered airports, *ACRP Report 129: Evaluating Methods for Counting Aircraft Operations at Nontowered Airports* identifies the different methods and their advantages or disadvantages to assist you in selecting the most appropriate method for your facility. *ACRP Report 129* built upon the findings of *ACRP Synthesis 4: Counting Aircraft Operations at Nontowered Airports*, which surveyed the small airport industry to identify frequently used methods.

For small airports with an ATCT, the tower count can be used, which is also recorded by the FAA and can be accessed at the FAA's Air Traffic Activity System (ATADS). If there are periods of time when the tower is closed, an estimate of the operations during this period should be added to the tower count. The operations during off-hours can be estimated by observing operations during the off-hours and using that to estimate a percentage of operations that occur during off-hours.

### Critical Aircraft

The critical aircraft is the most demanding aircraft type or group of aircraft with similar characteristics that make regular use of the airport. As identified in FAA Advisory Circular 150/5000-77: Critical Aircraft and Regular Use Determination, "regular use" is defined as 500 annual operations, either a takeoff or a landing, excluding touch-and-go operations. The critical aircraft sets the dimensional requirements on an airport for items such as safety areas, OFAs and separation between runways, taxiways and fixed or movable objects.

At nontowered airports, to help identify the critical aircraft, especially transient users, the FAA's Traffic Flow Management System Counts (TFMSC) can be used. The FAA's TFMSC data provides a record of IFR flights. Corporate aircraft, which are usually the majority of the critical aircraft operations at an airport, generally operate on an IFR flight plan. An IFR flight plan always includes the aircraft type. While the TFMSC data may not capture every operation by a critical aircraft at an airport, it captures the vast majority of the operations at no cost to the airport. The TFMSC records can be sorted by period of time as well as type of aircraft. There are also services from which you can purchase records of IFR operations. The use of IFR flight records allows the airport to identify local and transient operations.

Photographs of the critical aircraft using the airport are helpful to document the activity and support the need for the proposed requirements.

If locally based aircraft or regular transient users are critical aircraft operators, you should reach out to them to gather their operational data. The most helpful data users can provide is the number or estimated number of annual operations, as well as the aircraft operating requirements at your airport. Aircraft operating requirements will vary with temperature, elevation and the wet or dry condition of the runway. A sample user survey for aircraft operational data is included in *ACRP WebResource 6*. Additional types of user and benchmarking surveys are discussed in more detail in Section 5.13: Airport User Surveys, Benchmarking Studies and Peer Reviews.

User data is essential when justifying the need for larger facilities. You should start gathering data when a change in operations is noticed. At a minimum, the aircraft tail number should be noted. Other useful information, if the aircraft operator is willing to share, is aircraft operational requirements, frequency of operations and purpose of operations. Photographs of the critical aircraft using the airport are also useful to share with funding agencies when pursuing funding for improvements. Be aware that some companies are reluctant to share information regarding their operations. When this occurs, recording the aircraft type and the frequency they use the airport may be the best data that can be captured and then supplemented by IFR record data.

## Identifying the Design Standards for Airport Facilities

Airport design standards are identified by defining the airport reference code (ARC)—composed of the aircraft approach category and airplane design group—and taxiway design group (TDG). Table 12 defines the two components of ARC. In 2012, the FAA updated its design standards with the publication of FAA Advisory Circular 150/5300-13A. Taxiway design standards were one of the key changes in Advisory Circular 150/5300-13A that must be taken into account during planning. The FAA uses TDG, which is separate from ARC. The TDG is based on the wheel-span width and distance from nose to main gear. These new taxiway standards generally reduce taxiway width in straight sections but increase it at turning fillets. With more variation in taxiway width, airports may find the taxiway designed with the new standards to be more challenging to maintain, especially during snow removal operations.

### *Runway Protection Zone*

Land use in a runway protection zone (RPZ) is another element that is a focus of the FAA and further specified in FAA Advisory Circular 150/5300-13, because it solidified the FAA's guidance

**Table 12. Airport reference code.**

| Aircraft Approach Category | | |
|---|---|---|
| **Category** | **Approach Speed (knots)** | |
| A | <91 | |
| B | 91–121 | |
| C | 121–141 | |
| D | 141–166 | |
| E | >166 | |
| **Airplane Design Group** | | |
| **Design Group** | **Wingspan (feet)** | **Tail Height (feet)** |
| I | <49 | <20 |
| II | 49–78 | 20–<30 |
| III | 79–117 | 30–<45 |
| IV | 118–170 | 45–<60 |
| V | 171–213 | 60–<66 |
| VI | 214–262 | 66–<80 |

Source: FAA Advisory Circular 150/5300-13A, Change 1, February 26, 2014

on avoiding developed land uses where people gather within an RPZ. The FAA Interim Guidance on Land Uses Within a Runway Protection Zone lists the land uses that require coordination and approval from the FAA when it would enter the limits of the RPZ as a result of any of the following:

- An airfield project (runway extension or shift)
- A change in critical aircraft
- A new or revised instrument approach procedure that increases the size of the RPZ
- A local development proposal within the RPZ, including uses summarized in the text box

**New or Modified Land Uses in RPZ Requiring FAA Coordination**

- Buildings and structures
- Recreational land use
- Transportation facilities, including rails, public roads/highways and parking lots
- Fuel storage facilities
- Hazardous material storage
- Wastewater treatment facilities
- Above-ground utility infrastructure, including solar panels

Source: FAA Interim Guidance on Land Uses within a Runway Protection Zone, September 27, 2012

The FAA recommends that an airport have a property interest in the RPZ; fee simple is preferred, but at a minimum, an avigation easement is required. Ownership of the RPZ allows an airport to control the land use; however, this is not always feasible, as proposed new airfield development may move or increase the size of the RPZ—in which case, coordination with the FAA is required and can be included as part of the planning for the improvement. *ACRP Report 168: Runway Protection Zones (RPZs) Risk Assessment Tool Users' Guide* can help an airport sponsor assess the risk of an aircraft accident and the risk to people and property on the ground, based on the land use. This allows airport sponsors to assess alternatives and identify the highest priority for RPZ improvements to reduce the risk level.

At many small airports, farmland is used to protect the airport from incompatible development. Agricultural leases can be an important revenue generator and can reduce the amount of land the airport needs to mow or otherwise maintain. When leasing land for farming, the airport operator must be aware of limits on farming operation on the airport from a height and wildlife attractant perspective. This can be captured in a farming plan that is prepared as a part of an ALP.

## 5.4 Airport Business Planning

### Key Insights

*There are multiple tools that can be used for the planning and operations of the airport to help maximize the revenue and value to the community.*

*Because aviation is a fast-changing environment, airport management and its policy board must reset their mission and vision for the airport every 10 years or so.*

*The FAA has identified strategic and business planning as an important function for airports to move toward financial self-sufficiency.*

### Key Definitions

**Airport master plan (AMP)**: An assembly of appropriate documents and drawings covering the development of a specific airport from a physical, economic, social and political jurisdictional perspective by assessing current and projected demands. The master plan typically has a time frame of 20 years, with short-, intermediate- and long-term goals within that time frame. The airport layout plan is a part of this plan.

**Business plan**: A written plan defining how the airport will operate on a day-to-day basis to achieve established goals and objectives. A business plan translates longer-term goals into action plans. A business plan focuses on the short term.

**Strategic plan**: A written plan identifying the vision and long-term directional goals for an airport, typically having a time frame of 10 to 20 years.

**Grant Assurance 24: Fee and Rental Structure**

[The airport sponsor] will maintain a fee and rental structure for the facilities and services at the airport which will make the airport as self-sustaining as possible under the circumstances existing at the particular airport, taking into account such factors as the volume of traffic and economy of collection. No part of the federal share of an airport development, airport planning or noise compatibility project for which a grant is made under Title 49 of the United States Code, the Airport and Airway Improvement Act of 1982, the Federal Airport Act or the Airport and Airway Development Act of 1970 shall be included in the rate basis in establishing fees, rates, and charges for users of that airport.

### Airport Business Plans

FAA Grant Assurance 24 requires the airport to be as financially self-sustaining as possible. One way to demonstrate compliance with this goal is to develop an airport business plan. A business plan also demonstrates to the community that the airport is being a good steward of its resources by establishing goals and developing plans that are consistent with the mission and vision of the airport and airport policy board.

A strategic plan, business plan and AMP are the three primary planning tools. The content of these planning tools is interrelated and provides the road map, description and strategic focus for the airport going into the future.

Strategic plans are more vision, mission and goals oriented, with a focus on staffing and setting policies. *ACRP Report 20: Strategic Planning in the Airport Industry* describes strategic planning, the process, its benefits and the development of mission, vision and values statements. *ACRP Report 20* also includes case studies and has an associated workbook of tools to assist in implementing a strategic planning process.

If an airport is undertaking a business plan and does not have a strategic plan, some of the strategic planning elements should be included in the business plan because they provide the framework for the business plan. Business plans can include the more strategic elements described

above, but they are typically more focused on the inner workings of the airport as a business and usually focus on implementation goals that will render better safety and security, project delivery and customer service and improvements to operations, finances and the bottom line. Business plans should focus on best management practices, KPIs for all the above-mentioned segments and process improvement goals. A business plan typically has a short-term planning horizon, with initial actions being undertaken in the first year. The full implementation of all the elements may take up to about 5 years.

As noted, the airport master plan is typically a 20-year planning document that identifies the capital development required to support the strategic and business plans for the airport.

## Business Plan Content

As described in *ACRP Report 77: Guidebook for Developing General Aviation Airport Business Plans*, a business plan typically contains the following elements:

- Mission statement: conveys the purpose of the airport
- Vision statement: describes the aspirations for the airport
- Values statement: describes the belief of the airport organization
- Goals: identify the desired outcome that must be achieved to realize the mission and vision for the airport
- Objectives: define significant steps toward achieving a goal
- Action plans: identify who is going to do what, when, where, why and how to accomplish a specific objective
- Budget: forecasts the potential financial performance of the airport with the implementation of the plan

*ACRP Report 77* includes a series of presentations and worksheets for developing and implementing an airport business plan. The Florida DOT Aviation and Spaceports Office prepared the Florida General Aviation Airport Business Plan Guidebook to assist Florida airports in business planning. Also available is a primer that it prepared to provide an overview of airport business plans.

## Funding for Business Plans

Airport business plans are not covered specifically as "eligible" as noted in FAA Order 5100.38. However, some block grant states have provided funding for stand-alone business-planning activities. Business-planning activities can be funded under an enhanced financial plan as part of a traditional AMP. Also, sustainability master plans offer an opportunity to fund business-planning activity as a key portion of the economic sustainability pillar in these plans. These types of planning efforts generally are funded with the use of FAA entitlements but can be covered in a discretionary grant, if the nonbusiness plan work scope can compete well for a discretionary grant. Sustainability master plans can be good options for competing successfully for discretionary funding and including business/financial planning as an approved section.

Other potential funding sources are state or local economic development funds, city or general funds, airport-retained earnings and state airport development grants. If the airport is located near a college or university that has its students involved in immersive learning, the preparation of a business plan for a small airport may be a task for which the airport can receive student assistance.

If the airport has staff available to work on the business plan, ACRP Report 77 provides step-by-step guidance and business planning templates to use in the preparation of an airport business plan.

## Use of the Business Plan

An airport should use the business plan to formulate its action plan, implement the plan, check if the desired progress is being made and make changes, as needed.

In addition to being a tool for the airport, the business plan is a good tool to manage the community's expectations of the airport. By communicating the airport's business plan goals with the airport stakeholders and local community, expectations of the airport from the various parties can be aligned. Because the airport business plan is a tool for reaching beyond the airport, when undertaking an airport business plan, it is important for the airport management to have buy-in from its policymaking board.

Along with the goals, key performance indicators should be established to provide a way to measure progress. KPIs allow for implementation accountabilities. They can also be used to help the airport manage stakeholder and community expectations by providing concrete measures of progress. Community awareness of the airport's managing of all of its resources in a sustainable manner can improve the local airport brand and relationships with all its stakeholders.

## 5.5 NextGen Opportunities

### Key Insights

*For small airports, the greatest benefit of the Next Generation Air Transportation System is improved instrument approach access to airports, with minimal cost.*

*The new, improved instrument approach access has come with some increased approach protection requirements. If a new, vertically guided approach is established, there is an additional approach surface the airport needs to protect that may be lower than the existing approach surfaces.*

*In larger metropolitan areas, the Next Generation Air Transportation System is changing the standard arrival and departure routings to increase airspace efficiency. Some of these changes have created concerns in neighboring communities because of changes in flight paths and noise exposure.*

### Key Definitions

**Approach procedure with vertical guidance (APV)**: An instrument approach procedure providing vertical and lateral electronic guidance.

**Area navigation (RNAV)**: A method of navigation that allows an aircraft to choose any course within a network of navigation beacons, rather than navigating directly to and from the beacons. It includes lateral navigation providing horizontal alignment guidance to the pilot and can include lateral navigation or vertical navigation providing horizontal and vertical guidance to a pilot.

**Automatic dependent surveillance—broadcast (ADS-B)**: A technological application for pilots and air traffic controllers that uses global positioning system satellites to determine aircraft location, ground speed and other data, and provides traffic and weather information directly to the cockpits of properly equipped aircraft. ADS-B out equipment allows the aircraft to transmit its position. ADS-B in and out allows the aircraft to transmit its position and receive weather data and flight information services.

**Global positioning system (GPS)**: A satellite-based navigation system operated by the Department of Defense, providing accurate latitude and longitude positions, times and speeds to civilian and military users.

**Instrument approach procedure (IAP)**: A series of predetermined maneuvers for the orderly transfer of an aircraft under instrument flight conditions from the beginning of the approach to a landing, or to a point from which a landing may be completed with visual references.

**Instrument landing system (ILS)**: A precision instrument approach system utilizing radio transmitters at the runway ends that provides precise descent and course guidance to the runway, permitting aircraft to land during periods of low ceilings or poor visibility.

**National Airspace System (NAS)**: The airspace, navigation facilities and airports of the United States along with their associated information, services, rules, regulations, policies, procedures, personnel and equipment.

**Next Generation Air Transportation System (NextGen)**: A federal program to transform the national airspace system from a ground-based system to a satellite-based system.

**Performance-based navigation (PBN)**: The broad range of technologies that rely on the performance and capabilities of the equipment on board the aircraft.

**Precision instrument procedure**: A standard instrument procedure for an aircraft to approach an airport, in which a vertical and horizontal guidance is provided to the pilot using an instrument landing system, military precision approach radar or global positioning system, with visibility of ¾ mile or less or a ceiling less than 250 feet.

**Required navigation performance (RNP)**: A type of performance-based navigation that allows an aircraft to fly a specific path between two three-dimensional defined points in space.

**U.S. terminal instrument procedures (TERPS)**: Procedures for instrument approach and departure of aircraft to and from civil and military airports.

**Vertical guidance surface (VGS)**: An imaginary 30:1 trapezoidal surface applicable to approaches with vertical guidance, extending from the runway threshold along the runway centerline to 10,000 feet from the runway end. Formerly referred to as glide path qualification surface (GQS).

## NextGen Instrument Approach Opportunities and Requirements

The NextGen program, initiated by the FAA in 2003 and anticipated to continue through 2030, is being implemented to modernize the NAS. The goal is to use technology to make the NAS more efficient. The program is made up of a series of initiatives for all phases of flight. One of the most visible has been GPS-based navigation.

NextGen uses the satellite-based GPS data for instrument approaches and other functions within the NAS. The intent of NextGen is to replace the ground-based system of very high frequency omnidirectional ranges (VORs), nondirectional beacons (NDBs), ILS and radar. These replacement systems include GPS-based approach procedures and ADS-B systems with associated improvements. While NextGen is replacing the ground-based system, a skeletal system of VORs will be maintained as a backup. Other portions of the ground-based system, such as the NDBs, are being decommissioned through attrition as parts to repair the systems are no longer available.

*ACRP Report 150: NextGen for Airports* is a five-volume set that informs airport operators about NextGen programs and how the technologies will affect airports and their operations:

- Volume 1: Understanding the Airport's Role in Performance-Based Navigation: Resource Guide
- Volume 2: Engaging Airport Stakeholders: Guidebook
- Volume 3: Resources for Airports
- Volume 4: Leveraging NextGen Spatial Data to Benefit Airports: Guidebook
- Volume 5: Airport Planning and Development

*ACRP WebResource 5: Tools and Case Studies for NextGen for Airports* provides engagement materials and a public information toolkit.

As part of using NextGen to make the NAS more efficient, the FAA has a goal to increase efficiency in metroplexes, metropolitan areas with multiple airports and complex air traffic flows. Small airports located in or near a metroplex should stay aware of and participate in the process. Additional information is available on the FAA's Metroplex web page.

## Automatic Dependent Surveillance—Broadcast

A key element to the full implementation of the NextGen air traffic control modernization initiative is for aircraft to communicate their positions among themselves. This is being accomplished by equipping aircraft with ADS-B transponders while also providing weather and flight information services.

As part of the transition to NextGen as the primary navigation system, the FAA has established the requirement that all aircraft operating in controlled airspace be equipped with at least ADS-B out (equipment that transmits information about an aircraft's altitude, airspeed and position from GPS-derived data), by January 1, 2020, per FAR §91.225. In recent years, there have been advances in ADS-B technology that are reducing the equipment cost for the GA community.

While ADS-B out is required, aircraft should also be equipped for ADS-B in to take full advantage of the NextGen system. ADS-B in is the equipment that allows the aircraft to receive ADS-B information, including traffic information service—broadcast (TIS-B) and flight information service—broadcast (FIS-B).

To obtain the full benefit from NextGen system improvements, aircraft owners also must equip their aircraft to benefit from the NextGen improvements. For pilots who intend to operate under IFR, there are specific certification requirements for the GPS equipment. Visual flight rules (VFR)-only pilots have many cost-effective options that increase positional awareness during flight.

## NextGen Benefits for Small Airports

The greatest NextGen benefit to small airports has been the GPS-based instrument approach procedures that make improved approach capabilities available to small airports with a relatively minor investment. In many cases, these improvements have included vertical approach guidance capability that was previously only available with ILS precision instrument approach systems. Also, the NextGen PBN-based approaches have provided more flexibility in design that has allowed approaches to be designed and established, particularly in more congested airspace, where ground-based approaches were not feasible.

To obtain the maximum benefit of the PBN approach, the airports must meet the runway design and threshold siting surfaces criteria associated with the desired approach minimums. Airports may also need to be more vigilant about protecting the airspace in the airport vicinity and potentially reduce the height of obstacles under their runway approaches. The condition of the airspace surrounding the airport is used to establish safe approach-decision heights and visibility minimums, and, conversely, these minimums are used to establish the airport design criteria requirements for future airport development.

## Airport Design Standards for Instrument Approaches

Historically, approach types have been classified as visual, nonprecision and precision, with precision approaches (ILS) being the only approaches with vertical guidance. With NextGen implementation, vertical guidance is available to more types of approaches, even for small airports that were not designed and built to meet the design or obstruction standards for an ILS approach. Therefore, the FAA developed and established new design standards to enable small airports to establish vertically guided approaches. However, the NextGen vertically guided approaches may have higher ceiling and visibility minimums than an ILS approach to maintain an adequate margin of safety.

Airport design standard requirements become more demanding at less than a ¾-mile visibility; FAR Part 77 imaginary surface criteria change at ¾-mile visibility. Therefore, it is becoming more common for smaller airports to have approaches with ⅞-mile visibility and a 250-foot ceiling. These are the lowest minimums available through PBN without the need to meet the precision approach requirements of FAR Part 77. To obtain the lowest possible minimums at your airport, it is essential to maintain clear approaches, as well as TERPS and airport design surfaces, as discussed in Section 4.10: Airport Obstruction Management.

**Table 13. Standards for instrument approach procedures.**

| Visibility Minimums | < ¾ Statute Mile | ¾ to <1 Statute Mile | ≥1 Statute Mile Straight in | Circling |
|---|---|---|---|---|
| **Potential ceiling, actual dependent on obstacles** | <250 feet | ≥250 feet | ≥250 feet | ≥350 feet |
| **Minimum clear approach slope (TERPS)** | 34:1 | 20:1 | 20:1 | 20:1 |
| **Vertical guidance possible*** | Yes | Yes with clear 30:1 approach surface | Yes with clear 30:1 approach surface | Not applicable |
| **Minimum runway length** | 4,200 feet (paved) | 3,200 feet | 3,200 feet | 3,200 feet |
| **Runway markings** | Precision | Nonprecision | Nonprecision | Visual (basic) |
| **Runway edge lights** | HIRL/MIRL | HIRL/MIRL | MIRL/LIRL | MIRL/LIRL for night minimums |
| **Parallel taxiway** | Required | Required | Recommended | Recommended |
| **Approach lights** | Required | Recommended | Recommended | Not required |

*Requires clear VGS
HIRL = high intensity runway light, MIRL = medium intensity runway light
Source: Adapted from FAA Advisory Circular 150/5300-13A, Change 1, Table 3-4, February 26, 2014

In determining the type of instrument approach an airport can accommodate, or desires to accommodate, a number of factors are considered. Those standards include runway length, markings and lighting, clear approach slopes and parallel taxiway requirements as shown in Table 13. During the approach planning stages, the airport management or sponsor should consider the minimums desired and determine the applicable safety standards. Note that additional TERPS procedure design criteria will apply and may impact the actual minimums.

**INSTRUMENT APPROACH ESTABLISHMENT**

- Make sure instrument approach is shown on ALP
- Make sure approach/departure surfaces are clear; take action as needed to clear them
- Request instrument approach to desired runway(s) via FAA's online system
- Obtain airport and survey data to support instrument approach in "leaf on" conditions, as required by the FAA
- Prepare environmental documentation, typically a categorical exclusion, for establishment of approach
- Champion/monitor progress until the instrument approach is published

## Establishment of an Instrument Approach

Establishment of a PBN-based instrument flight procedure (IFP) for your small airport will follow several critical steps. The first step is to include the proposed approach on the ALP. The airport must apply for the instrument approach on the FAA's Instrument Flight Procedures Information Gateway. As a part of the instrument approach request, the airport sponsor must provide survey, airport and environmental data that supports that request.

Survey data must include the most critical elements for IFP development, such as latitude, longitude and elevation information for the runway. The FAA requires the coordinates to be expressed in North American Datum of 1983 (NAD 83) or World Geodetic System 1984 (WGS 84) and the elevations in North American Vertical Datum of 1988 (NAVD 88). The accuracy for the latitude and longitude coordinates must be to the nearest one-hundredth (1/100) of a second, while runway end elevations must be surveyed to the nearest whole foot.

The request must also include the touchdown zone elevation for each end of the runway, which is the highest elevation along the first 3,000 feet from each runway end, and the airport elevation, with accuracy to the nearest whole foot. The IFP request should contain a survey report, stamped with the surveyor's professional seal.

Airports that are federally obligated must meet and maintain specific design standards contained in FAA Advisory Circular 150/5300-13; nonobligated airports

are strongly recommended to utilize the advisory circular criteria as best design practices for safety, especially if pursuing an instrument approach. Additionally, as required by the National Environmental Policy Act (NEPA), all major federal actions, including establishment of an IFP, are subject to environmental review before an action is carried out. The airport sponsor will be required to collaborate with the appropriate FAA staff to complete an initial environmental review form that will be used in the environmental review process. This form can be found as a part of FAA Order JO 7400.2: Procedures for Handling Airspace Matters.

Once the FAA has received all the information, the requested IFP is entered into the approach development process. This process can take up to 6 months to be published, which is dependent on the number of other instrument approaches being developed. If an instrument approach can be designed for the airport, the FAA will conduct a flight check of the procedure. The final step in the process is the publication of the approach procedure as a part of the regular procedure update and publication cycle (56-day update cycle).

## 5.6 Land-Use Compatibility and Zoning

### Key Insights

*The industry definition of what constitutes an airport-compatible land use has been somewhat vague; therefore, it is important to recognize two key elements that constitute land-use compatibility near airports:*

- *The impact of adjacent or proximate land uses and the densities or intensities of land use on airport safety and efficiency, as well as the public investment therein.*
- *The impact of airport operations, present and planned, on the health, safety and welfare of the public on the ground.*

*Airport land-use compatibility concerns generally affect the following areas:*

- *Noise, vibration and air quality issues, because airport operations generally produce these impacts that are perceived as undesirable and offensive to inhabitants of certain land uses.*
- *Aviation safety concerns that relate to the possibility of mass casualties in an incompatible land use as a result of an aviation mishap or as it relates to reduced margin of safety due to the location of structures within critical segments of airspace (tall structures), etc.*

*The location of incompatible land uses within certain areas around airports also results in a potential reduction of airport efficiency, because the airport sponsor is required to account for and accommodate off-airport impacts to airport design standards or critical airspace surfaces.*

### Key Definitions

**Airport influence area**: An area adjacent to an airport that can affect or be affected by airports and aircraft operations that necessitate restrictions on those land uses.

**Community comprehensive plan**: Generally, a formally adopted general or master plan for a community, which elaborates and codifies the community's long-range goals in the areas of land use, transportation, utilities, environmental and other areas, driven by established goals, objectives and implementing policies.

**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 10 decibels to sound levels for the periods between 10 p.m. and 7 a.m.

**Deed restrictions**: A legal mechanism to restrict the use of a property to certain conditions in perpetuity.

**Land-use density**: As it relates to residential land uses, the number of dwelling units allowed to be developed in a given area within a land use specified in a community's comprehensive plan.

**Land-use intensity**: As it relates to uses other than residential, a measure of allowable square footage allowed to be developed in a given area within a land use specified in the comprehensive plan (or zoning document).

**Zoning ordinances**: Ordinances that divide a community into zones or districts, according to the present and potential use of properties, for the purpose of controlling and directing the use and development of those properties.

## Defining and Promoting Airport-Compatible Land Use

Incompatible land uses in the airport vicinity have the potential to affect the efficiency of airport operations and to diminish the margin of safety for the flying public and welfare of the public on the ground. In a comprehensive sense, incompatible land uses near airports are detrimental to the airport's financial and social sustainability by potentially limiting the number and type of current or future operations, making the facility less attractive to potential tenants and influencing the community's goodwill toward the airport.

Airport land-use compatibility remains a challenging concept to define for airports in general but typically encompasses concerns with flight safety (tall structures, wildlife attractants, smoke or steam, glare), public safety (high concentrations of people, vulnerable population) or aircraft noise. The nature of incompatible use is broad and is highly dependent on the airport and its operations, the surrounding natural environment and the nature of the surrounding community. Per *ACRP Report 27: Enhancing Airport Land-Use Compatibility*, a three-volume resource, compatible land uses near airports have been defined by the industry as those that neither expose the public to unacceptable levels of noise or hazards nor constrain the airport's safe and efficient operations. There are legal issues associated with establishing airport-compatible land use as described in *ACRP Legal Research Digest 5: Responsibility for Implementation and Enforcement of Airport Land-Use Zoning Restrictions* and *ACRP Legal Research Digest 14: Achieving Airport-Compatible Land Uses and Minimizing Hazardous Obstructions in Navigable Airspace*.

Land-use compatibility and its goals should be promoted through proactive planning and zoning techniques to avoid the need for corrective or mitigating measures in the future. While Section 4.10: Airport Obstruction Management addresses the safety concerns and airspace protection methods related to tall-structure impacts on air navigation, this section addresses additional techniques that may be used separately or in conjunction with airspace protection. Proactive planning and zoning techniques may include comprehensive planning, airport protection zoning and permitting, deed restrictions, real estate disclosures, sector or area planning, transfer of development rights arrangements, and regional planning initiatives, depending on the type of community surrounding the small airport.

### *Comprehensive Planning*

This approach uses adopted, long-term local government goals, objectives and policies to promote organized community growth and address matters of future land use, transportation or transit, environment and amenity availability to protect the airport. The airport sponsor should work with the surrounding local governments to establish a comprehensive plan that directs incompatible uses away from the airport and promotes coordination among local government and airport planning efforts toward mutual compatibility. Moreover, comprehensive plans may be used to establish airport overlays that direct local planning and zoning authorities to coordinate potential airport impacts with the airport sponsor.

FAA-compatible land use around an airport is established by working closely with local governments and communicating the value of the airport to the communities.

### *Airport Protection Zoning and Permitting*

As a stand-alone means of protecting the airport from encroachment by incompatible uses, this method will likely yield the most effective results. A local zoning ordinance (or a combination of the ordinance with comprehensive policies or building codes) allows the airport sponsor to implement land-use controls that address matters of density or intensity of use, as well as heights of structures, vegetation and even construction equipment. An airport sponsor should seek to use any available state legislation to adopt, administer and enforce airport protection zoning for the aviation facilities within his or her jurisdictional limits. An in-depth

discussion of this approach is included in Section 4.10: Airport Obstruction Management of this guidebook.

### *Deed Restrictions*

Deed restrictions serve as a legal mechanism to restrict the use of a property to certain conditions in perpetuity. The legal document is attached to the property deed or title and can be an effective means of ensuring that land-use compatibility is achieved through restrictions on property use. Airport sponsors must be cognizant of the legal consequences of deed-restricted properties and understand that, generally, discovery of deed restrictions on a piece of property may occur late in the property sales transaction process. Under such circumstances, deed restrictions may be most effective in combination with other methods mentioned previously to protect the most critical areas around the airport.

### *Real Estate Disclosures*

Real estate disclosures serve a similar purpose to a deed restriction, but unlike the deed restriction, the disclosures cover a broader area and typically are not tied to a specific parcel or piece of property. The purpose of the real estate disclosure is to inform the property buyer of the property's proximity to the airport and any potential impacts of regular airport operations on the use and enjoyment of the property subject to purpose. *ACRP Legal Research Digest 12: Fair Disclosure and Airport Impact Statements in Real Estate Transfer*s explores real property disclosure laws particularly relating to the disclosure of proximity to an airport. Similar to deed restrictions, the key shortcoming of real estate disclosures is the timing when such disclosures are introduced in the sales process.

### *Sector or Area Planning*

Area plans may be developed as a segment of a community master plan or comprehensive plan to set forth overarching goals and a growth strategy for a large geographical area. Sector plans are most effective when they encompass the area owned or controlled by a single (or few) land owner(s), allowing for proactive land-use planning to occur. If the airport is surrounded by substantial tracts of undeveloped land with few landowners, this creates an opportunity to plan for the placement of airport-compatible land uses (light industrial, logistics, etc.) in the airport's vicinity to support and be supported by airport functions.

### *Transfer of Development Rights Arrangements*

The transfer of development rights can be used as either a proactive measure or a mitigation measure. The program allows local governments to set up "sending" and "receiving" areas within their jurisdictional boundaries, permitting land owners to sell or transfer their land development entitlements from a less desirable (e.g., less compatible) area to an area that is more suitable for dense development. The technique has been traditionally used to permanently protect natural resources (e.g., coastal areas or environmentally sensitive lands), while protecting the private property rights of the community's land owners.

### *Regional Planning Initiatives*

Regional planning initiatives are generally started by regional land-use or transportation planning organizations or through a collaborative effort between a number of collocated jurisdictions. The initiatives typically result in a regional growth strategy and growth management directives and objectives and maintain a high-level approach. As such, while regional planning initiatives usually will not contain actionable or enforceable policies regarding airport land-use compatibility, an evaluation of the airport's economic impacts and supporting objectives,

developed through a multijurisdictional collaborative process, gives the airport sponsor political leverage to implement airport protection zoning or land-use measures.

More information about planning techniques for airport land-use compatibility is available as a part of *ACRP Report 27*.

## Mitigation Measures for Land-Use Incompatibility

When proactive land-use compatibility measures are not available or have failed, the airport may need to use mitigation measures to minimize impacts on safety, operations and the surrounding community. Mitigation measures should be applied as items of last resort in the event that proactive measures have not been used during the community build-out process, have not been effective or are not financially feasible to implement. Mitigation measures may include the following:

- Where permitted by regulations, mitigation of on-airport environmental impacts (e.g., wetland impacts) on lands located outside of safety-critical zones
- Acquisition of avigation easements for properties subject to frequent overflight by aircraft operating to and from the airport that limit density or intensity of use on the property or permitted structure or tree and foliage heights
- Fee simple property purchases
- Purchase of development rights, conducted in a manner similar to the transfer of development rights mechanisms, thus allowing property owners the full economic benefit of the property's highest or best use under zoning
- Noise mitigation or insulation measures aimed at curbing the impact of aircraft flight over properties on property owners' indoor enjoyment

Many of the proactive or reactive measures are eligible for grants by the FAA but are subject to limitations. Close coordination with the local FAA ADO is recommended when planning to implement any of the aforementioned measures. The FAA also has specific land-use guidance for a runway protection zone, as discussed in Section 5.3: Airport Planning.

### *Planning and Establishing Airport Protection Land-Use and Zoning Regulations*

Airport protection zoning regulations remain one of the most effective means of guarding the airport from the encroachment by incompatible land uses, including impacts on airspace by tall structures. Clear, predictable and meaningful policies not only assist potential developers and land owners to understand the impact of their potential development on the airport (and vice versa) but also assist local government officials—who are often unfamiliar with aviation and airport operational requirements—with protecting the operations and development of the community's economic engine. Because state and local regulations on land-use planning vary widely, only best practices on such regulations can be addressed in this section. *ACRP Report 27*, Volume 1, Appendix C, contains a model local zoning ordinance for land-use compatibility. FAA Advisory Circular 150/5190-4A: A Model Zoning Ordinance to Limit Height of Objects Around Airports, while dated, provides a model of a zoning ordinance to limit height following Part 77 height restrictions, with limited land-use restrictions. *ACRP WebResource 6* contains an airspace zoning ordinance template similar to the one in FAA Advisory Circular 150/5190-4A. Frequently, a zoning ordinance to restrict height may be enacted as an overlay zone. Pennsylvania Department of Transportation provides model zoning ordinance language for an airport district overlay. The Transportation Research Synthesis by the Minnesota DOT, Airspace Protection and Land Use Zoning: A Nationwide Review of State Statutes, summarizes airspace zoning-related regulations by state and includes some sample airspace zoning ordinances.

### *Noise Compatibility*

The promotion of noise-compatible development can reduce a number of issues related to airport encroachment, community relations, social justice and sustainability. Protecting people on the ground from the effects of aircraft noise in a proactive manner can reduce the need for local governments to invest in noise insulation or property acquisition efforts. It also reduces the potential for negative community dynamics toward the airport. Because aircraft noise perception can vary from community to community, noise-compatibility planning needs to be established using regulations that are based on measurable and predictable standards. The FAA uses 65 DNL as the noise level above which noise-sensitive uses are not compatible. A list of noise-sensitive uses is part of FAR Part 150, which is the basis for a Part 150 noise-compatibility plan. It should be noted that as the aircraft fleet becomes quieter, many airports may find the 65 DNL contours are entirely contained within the airport limits. In such a case, if deemed necessary, more restrictive standards may need to be adopted by local governments to keep incompatible development from encroaching on the airport to protect the airport and the community from aircraft noise.

### *Determining and Establishing the Limits of Airport Influence*

An airport influence area, incorporated into the airport zoning regulations, should cover the areas of the surrounding jurisdictions that are subject to airport impacts or that may affect the airport operations with incompatible development. Delineation of the area provides local property owners and developers with advance notice that their proposal may be subject to additional regulations or scrutiny and may require additional steps during the permitting process for development. More important, it provides local government officials and decision makers with an idea of where airport impacts may occur and where federal or state aviation authorities may need to be involved. Establishing an effective airport influence area or airport protection zoning overlay, developed with the participation and buy-in of the local community, should focus on areas that are the most critical for airport operations or community welfare. Suggested areas to be included in an airport overlay are as follows:

- Airport 65 DNL noise contours
- Airport Part 77 obstruction surfaces
- Airport Part 77 notification surfaces
- Airport departure and one-engine inoperative surfaces

Development of the overlay must balance community buy-in and interests, practicability of zoning regulation enforcement within the extent of the overlay and airport operational and development interests.

### *Establishing Zoning Criteria Based on Best Practices*

Those jurisdictions located in proximity to airports, or within established airport influence areas, should be encouraged to reference best practices and industry guidance on developing zoning policies to establish practical standards for airport land-use compatibility. Such standards, as defined by the types of use and maximum density or intensity of use, should direct uses with densities or intensities not compatible with existing or planned airport operations away from the airport safety-critical areas (e.g., RPZs) and encourage more compatible development. *ACRP Report 27* contains practical and easy-to-understand guidance on evaluating land-use compatibility on the basis of use characteristics and permitted densities. The zoning policies should also address such items as impacts on RPZs due to emissions of light, glare or smoke; the location of wildlife attractants; and congregations of people under the airport's approach and departure surfaces.

### *Establishing Procedures and Mechanisms for Regulatory Implementation and Relief*

Lastly, airport protection zoning regulations should establish meaningful and predictable procedures for ordinance implementation. The procedures should consider private property rights in balance with the benefits of airport development and operations. The implementing entity should be prepared to address challenges of regulatory findings and regulatory relief. This may include the establishment of criteria for airport proximity disclosure, acquisition of property or avigation easements, injunctive relief or establishment of nonsuit covenants.

Airport protection zoning ordinances should be developed by considering private property rights balanced with the benefits of airport development. Ordinance development that provides an opportunity for input by all potentially affected local stakeholders, stands the best chance of being adopted, administered and enforced by the affected local jurisdictions.

## Communicating About Airport Land-Use Compatibility

Another key to promoting airport land-use compatibility is early, frequent and consistent education of elected officials and the community regarding aviation safety and airport standards, and the value and benefit of your airport to the community. These benefits include the airport's role in the community as the following:

- A connector to the airspace system
- A community economic driver
- A site for emergency response or recovery deployment
- A community focal point

Airport management and staff should proactively communicate the negative results to the community due to incompatible land use encroachment on the airport. These negative impacts may include the loss of local employers or businesses, having to repay federal grants because of grant assurance noncompliance and reduced current and future operational utility. *ACRP WebResource 1: Aligning Community Expectations with Airport Roles* contains helpful information regarding the proactive management of community expectations and public relations or engagement for airport managers.

## 5.7 Exhibit "A" Property Map

### Key Insights

*An FAA grant requirement is that before an airport receives federal funds for a project, it must prove it has appropriate ownership of the property on which the project is to occur.*

*An Exhibit "A" property map is only mandatory for federally obligated airports but may be useful to all airports. FAA Standard Operating Procedure 3 provides an outline of the requirements for an Exhibit "A" property map.*

### Key Definitions

**Exhibit "A" property map**: A drawing of the dedicated airport property, including detailed information about how the property was acquired, the funding source for the land and if the land was conveyed as federal surplus land or government property.

**Land release**: The release of airport property not needed for present or future aeronautical purposes but subject to federal obligations from the terms of the agreement with the U.S. government. It is defined as the formal, written authorization discharging and relinquishing the FAA's right to enforce an airport's contractual obligations.

### Importance of the Exhibit "A" Property Map

To meet Grant Assurance 4: Good Title, the airport sponsor has a federal obligation to submit an accurate Exhibit "A" property map when the airport applies for, and prior to execution of, a federal grant. To meet these requirements, a current Exhibit "A" property map must be submitted with a grant application for land acquisition or new development to demonstrate that the airport sponsor owns or controls the land on which the development will be constructed. For projects not involving land acquisition, a current Exhibit "A" property map that was previously submitted can be referenced in the grant application.

The FAA defines an Exhibit "A" property map as

- Containing a snapshot of the inventory of parcels that make up dedicated airport property,
- Identifying how the land was acquired,
- Identifying the funding source for the land, and
- Indicating whether the land was conveyed as federal surplus land or government property.

An airport sponsor is federally obligated to obtain FAA consent to remove any land described and shown on the Exhibit "A" property map through its formal land-release process. For a new airport or an airport receiving its first AIP grant, an Exhibit "A" property map depicting the land required to support the facilities needed to operate the airport must also be submitted.

### Exhibit "A" Property Map Content

The purpose of an Exhibit "A" property map is to provide a visual depiction of airport properties, which are owned fee simple or subject to easements, supported by property data tables. The Exhibit "A" property map must include the following:

- The outside airport property boundary, including all fee-interest, leased and easement properties, must be identified. All discrepancies between recorded and surveyed information should be noted, and base map data sources should be identified.

- Each segment of the property boundary must be clearly described, using metes and bounds, township/range/section, lot and block, plat or any other appropriate property description.
- All airport property parcels must be shown and uniquely designated, consistent with the previous Exhibit "A" property map (if applicable). Any new or future property acquisitions may use a new or updated designation system.
- Any parcels that were once airport property must be shown. If the parcel was released, FAA approval data and the date of disposal must be shown.
- Parcel information must include grantee (selling owner); type of interest acquired and acreage; type of conveyance instrument; public land record reference, such as book and page; and date of recording. This information is typically included in a tabular format.
- For each property parcel, the way the property was acquired and when (e.g., FAA grant number and year, if acquired under a grant, PFC project number, surplus property transfer agreement information) must be shown, where applicable.
- For easements, the type of easement, such as clearing, avigation, utility and right-of-way, and any applicable dates of expiration must be included. Easement information should indicate whether the airport owns the easement or has granted the easement, such as an easement granted to a utility company.
- Proposed acquisition areas, with the purpose of acquisition (aeronautical, noise compatibility, future development) and current property owner, must be included.
- Airport infrastructure and configuration, including RPZs, runways, runway safety areas, OFAs, taxiways, design surfaces and building restriction lines, must be included.
- Date of Exhibit "A" property map, north arrow, map legend and scale must be included. The Exhibit "A" property map should be updated whenever there is a change to any airport property.

**Grant Assurance 4: Good Title**

a. [The airport sponsor], a public agency or the federal government, holds good title, satisfactory to the Secretary, to the landing area of the airport or site thereof, or will give assurance satisfactory to the Secretary that good title will be acquired.
b. For noise compatibility program projects to be carried out on the property of the sponsor, [the sponsor] holds good title satisfactory to the Secretary to that portion of the property upon which federal funds will be expended or will give assurance to the Secretary that good title will be obtained.

The airport sponsor must also depict on the Exhibit "A" property map all land that has been acquired for noise-compatibility purposes. These properties must be shown on the Exhibit "A" property map to document the airport's ownership of the land and be incorporated in an FAA-accepted noise inventory and reuse plan. At larger airports with noise land, a separate noise land inventory map can be prepared, and the Exhibit "A" property map may reference the noise land inventory map. The *FAA's Noise Land Management and Requirements for Disposal of Noise Land or Development Land Funded with AIP* provides guidance to airport sponsors to help manage and purchase land as part of a noise-compatibility program.

The goal of noise-compatibility programs is to acquire impacted noise-sensitive uses and transition the land to a compatible use. The noise inventory and reuse plan indicates the ultimate use of the land, either disposal for a compatible use or future airport development. The FAA must approve changes to the Exhibit "A" property map noise lands, including the necessary airspace or other restrictions on the use of disposed land. When noise land is disposed of, the proceeds must be "returned to the FAA," although this frequently occurs through reinvestment in a noise program or airport development.

FAA Standard Operating Procedure 3: FAA Review of Exhibit "A" Property Inventory Maps is a good guide to use when preparing or reviewing your airport's Exhibit "A" property map and includes the Exhibit "A" property map review checklist used by the FAA ADO staff. Additional information on the Exhibit "A" property map and associated land acquisition requirements can be found in FAA Advisory Circular 150/5100-17: Land Acquisition and Relocation Assistance for Airport Improvement Program Assisted Projects.

## 5.8 Environmental Documentation

### Key Insights

*Airport improvements that are federally funded, or that change an airport layout plan that has been approved by the FAA, are considered federal actions and must be environmentally reviewed under the National Environmental Policy Act.*

*The FAA Airports office may provide conditional, unconditional or mixed approval of a project included in an airport layout plan. Unconditional approval requires airspace and environmental approval.*

*In addition to the National Environmental Policy Act, there are other federal, state and local environmental regulations applicable to airports.*

### Key Definitions

**Categorical exclusion (CATEX)**: A category of actions that do not individually or cumulatively have a significant effect on the human environment and for which neither an environmental assessment nor an environmental impact statement is required. (Documentation in the form of a CATEX checklist still must be prepared by the airport or its sponsor.)

**Council on Environmental Quality (CEQ)**: A division of the Executive Office of the President that coordinates federal environmental efforts in the United States and works closely with agencies and other White House offices in the development of environmental and energy policies and initiatives.

**Environmental assessment (EA)**: An assessment of the environmental effects of a proposed action for which federal financial assistance is being requested or for which federal authorization is required. The EA serves as the basis for the FAA's environmental impact statement or finding of no significant impact.

**Environmental impact statement (EIS)**: A document prepared under the requirements of the National Environmental Policy Act of 1969, Section 102(2)(c) representing a federal agency's evaluation of the effect of a proposed action on the environment. (The FAA will serve as the sponsor of an EIS.)

**Extraordinary circumstances**: When an action that is normally categorically excluded may cause significant adverse environmental impacts, including the consideration of special-purpose requirements.

**Finding of no significant impact (FONSI)**: An administrative determination by the FAA that a proposed action by the airport sponsor will have no significant impact on the environment.

**Metropolitan statistical area (MSA)**: A geographical area defined by the U.S. Office of Management and Budget for use by federal statistical agencies in collecting, tabulating and publishing federal statistics.

**National Environmental Policy Act (NEPA)**: A U.S. environmental law that established a U.S. national policy promoting the enhancement of the environment. NEPA requires each federal agency to disclose to the public a clear, accurate description of the potential environmental impacts that the proposed federal action and reasonable alternative to those actions would cause.

**Navigable waters**: Interstate waters; interstate lakes, rivers and streams that are used by interstate travelers for recreational or other purposes; interstate lakes, rivers and streams

from which fish or shellfish are taken and sold in interstate commerce; and the tributaries of such waters.

**Record of decision (ROD)**: A written decision of the FAA's approval or disapproval of an action proposed in an environmental impact statement. The ROD explains what the airport sponsor proposes to do and why, identifies actions the FAA and other federal agencies must take, explains the alternatives analyzed and which one is environmentally preferred and identifies the required mitigation measures.

**Written re-evaluation**: Documentation of the validity of a previously prepared environmental assessment or environmental impact statement. If substantial changes are found, a supplement to the previously prepared environmental assessment or environmental impact statement may be required.

## National Environmental Policy Act

NEPA went into law January 1, 1970, requiring federal agencies to assess the environmental effects of their proposed actions prior to making decisions. This act requires that federal agencies establish a process to use a systematic, interdisciplinary approach. NEPA also established the CEQ to oversee NEPA implementation. CEQ issued guidance for how federal agencies were to implement these requirements. The FAA Airport Environmental Programs web page provides resources to assist airports in addressing NEPA requirements.

FAA Order 1050.1: Environmental Impacts: Policies and Procedures translates the NEPA requirements to the FAA and lists the following environmental impact categories that must be considered:

- Air quality
- Biological/ecological resources (including fish, wildlife and plants)
- Climate
- Coastal resources
- Department of Transportation Act 4(f) and 6(f) resources
- Farmland
- Hazardous material, solid waste and pollution prevention
- Land use
- National Historic Preservation Act resources, including historical, architectural, archaeological and cultural resources
- Natural resources and energy supply
- Noise and compatible land use
- Socioeconomics, environmental justice and children's environmental health and safety risks
- Visual effects including light emissions
- Water resources, including wetlands, floodplains, surface waters, groundwater and wild and scenic rivers

FAA Order 5050.4: National Environmental Policy Act (NEPA) Implementing Instructions for Airport Actions is specific to the FAA Airports line of business that oversees AIP grants for airports. The FAA's Environmental Desk Reference for Airport Actions summarizes the special-purpose laws and associated environmental impact categories to assist with NEPA implementation.

### *State Environmental Regulations*

In addition to complying with NEPA, airports may also need to comply with any state environmental regulations, especially in California, where these regulations may be more restrictive

than NEPA. *ACRP Legal Research Digest 22: The Role of the Airport Sponsor in Airport Planning and Environmental Reviews of Proposed Development Projects Under the National Environmental Policy Act (NEPA) and State Mini-NEPA Laws* provides a summary of relevant federal and state environmental review statutes and the responsibility of various stakeholders.

## Environmental Analysis for Airport Projects

The environmental documentation for an AIP-funded project should be completed by the end of the federal fiscal year, prior to the anticipated year of the construction project.

The FAA recognizes that it is important for the environment to be considered throughout a project's formulation. Therefore, the FAA guidance requires that the environment be considered in the planning process. This is done through the preparation of at least an environmental overview that evaluates the impact categories as they relate to the proposed development, as part of a master plan or ALP update. Considering the environment during planning allows environmental considerations to be taken into account when evaluating alternatives. The preparation of environmental documentation for a project is eligible for an AIP grant. The environmental documentation can be funded with an AIP grant or reimbursed with an AIP grant.

**PROJECTS TYPICALLY ELIGIBLE FOR A CATEX**

- *Landing strip, taxiway, apron or loading ramp construction or repair work*, including extension, strengthening, reconstruction, resurfacing, marking, grooving, fillets and jet blast facilities and new heliports on existing airports, except where such action will create environmental impacts off airport property
- *Installation or upgrade of airfield lighting systems*, including runway-end identification lights, visual approach aids, beacons and electrical distribution systems
- *Installation of miscellaneous items*, including segmented circles, wind or landing direction indicators/measuring devices or fencing
- *Construction or expansion of passenger-handling facilities*
- *Construction, relocation or repair of entrance and service roadway*
- *Grading or removal of obstructions on airport property and erosion-control actions with no off-airport impacts*
- *Landscaping, generally, and landscaping or construction of physical barriers to diminish impact of airport blast and noise*
- *Projects to carry out noise compatibility programs*
- *Land acquisition and relocation associated with any of the above items*
- *Federal release of airport land*
- *Removal of a displaced threshold*

Source: FAA Order 5050.4B, April 28, 2006

The FAA groups environmental considerations into 19 categories, as identified in FAA Order 5050.4. Not all categories will apply to all airports or all projects, but each must be reviewed to determine whether it is applicable. If applicable, additional analysis is needed to determine if there would be a potential impact. As part of a planning study, the anticipated level of required environmental documentation can be identified.

All projects receiving federal funding require an environmental review and appropriate documentation. Because FAA approval of an ALP is a federal action, projects that change an airport's ALP, even if nonaeronautical, also require environmental documentation. Appendix 1 of FAA Order 5050.4 contains flowcharts to help airport sponsors identify the most appropriate level of environmental documentation based on the anticipated potential environmental impacts.

### *Categorical Exclusion*

A CATEX is the shortest form of an environmental review. Airport projects, referred to as actions, usually eligible for a CATEX are found in Tables 6-1 and 6-2 of FAA Order 5050.4. These actions do not normally, individually or cumulatively, have a significant effect on the environment. However, some of these actions must be evaluated to determine if there are any extraordinary circumstances that would require a more detailed environmental review. As part of this evaluation, for a project disturbing new areas, the sponsor should solicit comments from appropriate environmental agencies, including U.S. Fish and Wildlife Service and state wildlife agencies (threatened and endangered species), U.S. Army Corps of Engineers (wetlands), U.S. Department of Agriculture (farmland) and state historical and archaeological resources (cultural resources). These solicitation letters should include a description of the project, a location map and an exhibit of the project. As part of FAA Standard Operating Procedure 5: CATEX Determinations, the FAA developed a CATEX form to document a project's eligibility for a CATEX. An airport sponsor may use a consultant to prepare a CATEX, or it may be prepared internally.

Any impact in an environmental category can change a project's environmental documentation process from a CATEX to an EA, but the most common

(extraordinary circumstances) are biological (endangered or threatened species), National Historic Preservation Act, DOT 4(f) or 6(f) areas, wetlands and coastal resources, where applicable. When preparing a CATEX, it is necessary to demonstrate that there are no environmental impacts. When a project is disturbing new areas, field studies may be necessary as part of CATEX to demonstrate no impacts. If there are impacts but they can be mitigated, it will be necessary to prepare an EA.

## Environmental Assessment

The EA is intended to be a concise document that takes a hard look at the expected environmental effects of a proposed action. The following actions normally require an EA:

- Categorically excluded actions involving extraordinary circumstances
- Helicopter facilities or airport operations that increase noise over noise-sensitive areas within a DNL of 65 dB
- Land for any project typically requiring an EA
- A new airport serving general aviation
- A new airport location serving commercial service not in an MSA
- A new runway, major runway strengthening or extension
- Projects involving prime and unique farmland, navigable waters or wetlands
- Other circumstances that have a controversy because the proposed action involves a special-purpose environmental law

Typically, an airport sponsor will use a consultant to prepare an EA. The consultant selection for the preparation of an EA must be per FAA requirements for the costs to be grant eligible.

The FAA is generally the lead agency for airport projects. While not common, there can be a cooperating agency that will work with the FAA on the EA. Cooperating agencies are more common when preparing an environmental impact statement, which is discussed in the next section.

For projects that are not included on the CATEX list but are not anticipated to have an adverse environmental impact, an EA short form may be completed and is usually available from the FAA region. This form can also serve as a screening tool for a project with potential environmental impacts. The FAA's Eastern Region is one of the regions that has an EA short form available, a copy of which is included in *ACRP WebResource 6*.

## Environmental Impact Statement

An EIS is typically prepared when an EA identifies a significant impact, or a significant impact is identified before an EA is started. For instance, an EIS is required for a new commercial service airport in an MSA or a new runway in an MSA. When preparing an EIS, while the airport sponsor funds the study—which is eligible for AIP grant funding—the FAA selects the consultant. An EIS is typically a longer, more detailed document than an EA. The process is also more involved and starts with a detailed scoping process that includes stakeholder, agency and public involvement. If a small airport needs to prepare an EIS, the airport sponsor works closely with the FAA ADO to properly scope and implement the process.

## Everyday Environmental Considerations

*ACRP Report 43: Guidebook of Practices for Improving Environmental Performance at Small Airports* helps small airports identify applicable federal environmental-compliance requirements, outlines practices that proactively enhance environmental stewardship and identifies

resources and tools. It assists airport managers in being cognizant not only of federal requirements for the management of environmental impacts but also of the best practices for the mitigation of such impacts.

### *Noise Impacts*

Noise is one of the most recognizable effects of airport operations. The FAA models aircraft noise through the use of the Aviation Environmental Design Tool (AEDT). AEDT also models air quality emissions at airports, generally larger or busier small airports where noise becomes a significant source of concern with the community. The airport operator may employ measures to help mitigate noise, including but not limited to voluntary noise abatement procedures, voluntary noise curfews and limitations on the operations of auxiliary power units during night hours. Beyond such measures, noise mitigation measures, such as noise attenuation measures for structures, restrictions on noise-sensitive land uses, requirements for noise attenuation of new construction and fee simple acquisition of properties in noise-sensitive areas may be required. Typically, before implementing a noise mitigation measure, an airport operator will complete a noise study. The FAA has types of noise-related studies. The completion of these studies and implementation of the recommendation are means by which to reduce an airport's noise footprint.

**FAR Part 150.** The regulations contained in Part 150 govern and specify the methodology and criteria for the development of noise-exposure maps and implementation of noise-compatibility programs based on the findings of the airport-specific Part 150 studies on noise-compatibility planning. FAR Part 150 studies are voluntary. However, airports that complete an FAR Part 150 study are eligible for AIP noise grants to implement projects that reduce the airport's noise exposure. FAA Advisory Circular 150/5020-1: Noise Control Planning for Airports provides guidance for noise control and compatibility planning and preparation of noise-exposure maps. The FAA web page Noise Compatibility Planning Toolkit provides some additional resources on noise and land-use compatibility.

**FAR Part 161.** Airport operators may apply to the FAA for the approval of Stage 3 aircraft noise and access restrictions, which limit the type of aircraft, establish an official noise abatement approach and departure procedures or limit the hours of Stage 3 aircraft operations. Such restrictions are subject to FAA review, approval and restrictions. Stage 3 certification applies to civilian aircraft great than 75,000 pounds, which may not be that common at small airports.

### *Air Quality Impacts*

Airports can have mobile and stationary emissions sources. Stationary sources include fuel tanks, generators, boilers, heaters, paint booths and deicing facilities. Mobile sources include aircraft, motor vehicles, ground support equipment and construction equipment.

The FAA has started to implement a number of measures that seek to address airport carbon emissions (from airport operations). One of these measures is the FAA's Voluntary Airport Low Emission Program (VALE) grants, which are available to commercial service airports in non-attainment or maintenance areas for National Ambient Air Quality Standards. Eligible project types include mobile and stationary equipment replacement that will reduce on-airport emissions. While VALE may not be applicable to most small airports, it is important to know it exists and what airports qualify.

Another air quality-related initiative of the FAA is the development of a replacement fuel for 100LL avgas. Avgas is one of the few remaining leaded fuels used in the United States. However, most of the piston-powered aircraft fleet are certified to operate on avgas. Therefore, the replacement fuel will need FAA approval to serve as a certified replacement for avgas.

*ACRP Report 56: Handbook for Considering Practical Greenhouse Gas Emission Reduction Strategies for Airports* presents information and tools of use to many airports. Some of the strategies identified can be employed at any airport, and some are related to commercial service operations. AirportGEAR, an interactive tool developed as a companion to *ACRP Report 56*, is available for download from the ACRP website. The CD-ROM that accompanies *ACRP Report 56* includes fact sheets (Appendix A), upon which AirportGEAR is based, and a presentation (Appendix C) on practical greenhouse gas emission reduction strategies. The two appendices are also available from *ACRP WebResource 6*.

### *Water Quality*

Water quality, especially through the management of stormwater, is an important consideration in an airport's operation. Even airports that receive little precipitation must have measures in place to minimize stormwater exposure to pollutants. *ACRP Report 53: A Handbook for Addressing Water Resource Issues Affecting Airport Development Planning* provides information on establishing a water resource management program and integrating it into project planning and implementation. *ACRP WebResource 3: Airport Stormwater Management Library & Training Materials* provides stormwater information resource and training for airports.

Stormwater permitting regulates the impacts of construction and industrial activities on the stormwater runoff to benefit wetlands and aquatic ecosystems, protect the health of the public and improve the quality of receiving bodies of water. The permitting mechanism is intended to prevent stormwater runoff from washing harmful pollutants into local surface waters. *ACRP Report 169: Clean Water Act Requirements for Airports* summarizes Clean Water Act-related permits. Two of these stormwater management permitting processes may be applicable to your airport.

### *National Pollutant Discharge Elimination System*

To stay in compliance with NPDES regulations, airports should prohibit aircraft washing, unless an appropriately drained wash rack is provided.

Airports that have industrial activities, which include deicing operations, with a point-source discharge to waters of the United States are required to obtain a National Pollutant Discharge Elimination System (NPDES) operating permit. There are two types of NPDES permits: operating and construction. NPDES permits are issued by states with permitting authority or by EPA regions where the state does not have authority. The EPA's NPDES website provides information to help airports determine the applicability of this permitting program.

Within the list of operating permits, an airport may hold an individual or general permit. An individual permit is written specifically to a facility. A general permit is written to cover multiple discharges with similar operations and types of discharges. As a part of the NPDES permit, a stormwater pollution prevention plan (SWPPP) must be developed. The SWPPP identifies all potential sources of pollution anticipated to affect the quality of stormwater discharge and describes what practices will be used to reduce pollutants in the stormwater discharge and how compliance with permit requirements will be met and maintained. The EPA has a guide for developing an SWPPP. The Iowa Office of Aviation has a sample SWPPP in its online resource library.

The tenants' activities on an airport need to be incorporated into the NPDES permit and SWPPP. *ACRP Legal Research Digest 25: Analysis of Federal Laws, Regulations, Case Law, and Survey of Existing Airport NPDES Permits Regarding Tenant-Operator Responsibilities Under NPDES and Stormwater Management BMPs Under Owner/Airport's Operating Permits* summarizes state and federal stormwater regulations and the authority for taking enforcement action against airport owners related to tenant noncompliance issues. It also provides guidance for airport operators in enforcing tenant compliance with stormwater permit requirements.

NPDES construction permits are associated with ground-disturbing activities, such as construction projects. When airport construction will disturb more than the allowable area, an NPDES permit with the associated erosion-control plan is required. Even if a project is below the land-disturbing requirements for an NPDES permit, incorporating erosion-control measures is a best practice.

For airports with agricultural spraying operations, pesticide and herbicide management by the operators is important for managing the potential exposure of stormwater to these chemicals. They can be addressed as part of the SWPPP development. The University of Minnesota, Center for Transportation Studies, Airport Technical Assistance Program has published Agricultural Aircraft Operations on Municipal Airports as a guidebook for airport operators.

Another tool used by airports in managing stormwater quality is to control hazardous material storage, such as fuels and oils, through lease requirements that require the use of property containers and limit the quantity that can be stored on-site.

### *Spill Prevention, Control and Countermeasure*

If installing above-ground fuel storage tanks, be sure to complete an SPCC plan.

As detailed in the EPA guide Spill Prevention, Control, and Countermeasure (SPCC) Regulation: A Facility Owner/Operator's Guide to Oil Pollution Prevention, airports with above-ground oil-storage capacity of greater than 1,320 gallons or a buried oil-storage capacity greater than 42,000 gallons with a reasonable potential for discharge into or on navigable waters of the United States are required to prepare an SPCC plan. Airports fall into the category of non-transportation industries in this regulation, in that airport activities involve oil that is distributed from bulk-storage containers to vehicles operating solely within the confines of the facility, such as fuel sales. The SPCC regulations require planning measures that define how the facility will address the prevention of, preparedness for and response to oil discharges into the environment. The airport sponsor is required to have an SPCC in place, regardless of whether the fuel is provided by the airport sponsor or a tenant FBO. The EPA has an Oil Spills Prevention and Preparedness Regulations website as well as the Spill Prevention, Control and Countermeasure (SPCC) Regulation guide with resource information.

### *Obstruction Management*

Airport operators must stay aware of environmental requirements when conducting ongoing management of vegetation and disposition of vegetative material. This is especially important when clearing trees or vegetation in areas where endangered or threatened species may use the trees or other habitats. If there are periods of the year when the species are not present in the airport area, as identified by the U.S. Fish and Wildlife Service, then the obstruction removal should occur during these periods. Also, any disposal of material should occur in an environmentally sensitive manner.

## State or Local Regulations

Other regulatory or local compliance may be required based on your local conditions, which may be a result of your airport's location in a particularly sensitive area, such as a spring protection area or in proximity to federally recognized tribal lands with higher water quality standards. Some states also have their own regulations on stormwater and water quality that must also be followed.

## 5.9 Sustainability in Everyday Operations

### Key Insights

*Environmental sustainability is the key element of the sustainability trifecta: fiscal, community or social and environmental sustainability.*

*Airport sustainability actions seek to reduce environmental impacts, maintain the airport's economic potential and promote the goals and actions that align with the goals and values of the communities surrounding the airport.*

*Environmental sustainability serves to protect the nation's natural resources, promote community goodwill and save the airport's financial resources in the long run.*

*It may also contribute to reducing the airport's carbon footprint, potentially affecting the climate change dynamic, and reducing the airport's greenhouse gas contributions.*

*Additionally, the FAA has begun an initiative that allocates Airport Improvement Program funding to the development of sustainable airport master plans and for certain airport sustainability planning initiatives.*

### Key Definitions

**Commissioning (Cx) and retro-commissioning (RCx)**: A comprehensive and systematic testing process of new (or existing, in the case of RCx) building components and systems to verify their design, installation and functionality in accordance with the client's specifications and operational demands.

**Envision**: A rating system for sustainable civil infrastructure; can be used alone or with other rating systems, such as the Leadership in Energy and Environmental Design system.

**Leadership in Energy and Environmental Design (LEED®)**: A rating system created by the U.S. Green Building Council that recognizes best-in-class building strategies and practices for sustainable features.

**Nonattainment area**: An area that does not meet one or more of the criteria pollutants of the National Ambient Air Quality Standards, as defined in the Clean Air Act of 1970.

**Voluntary Airport Low Emissions Program (VALE)**: FAA grants available to commercial service airports in nonattainment or maintenance areas for National Ambient Air Quality Standards for eligible project types, including mobile and stationary equipment that reduce on-airport emissions.

### Best Practices for General Sustainability Planning

The United Nations World Commission on Environment and Development, convened in 1983, was one of the first governmental entities that attempted to define sustainable development as that which meets the needs of the present generation without compromising the ability of future generations to meet their needs. *ACRP Synthesis 66: Lessons Learned from Airport Sustainability Plans* identified the top drivers of sustainability initiatives for airports as follows:

- Cost reductions
- Funding availability
- Management support

- Community relations
- Environmental compliance

Additionally, the airports surveyed for the synthesis listed community relations, environmental compliance and revenue generation opportunities as the key drivers, accurately reflecting the key pillars of sustainability—social, environmental and fiscal—as defined by the triple bottom line (TBL) model developed by John Elkington. ACI-NA broadened the definition of sustainability for airports to be a more holistic approach to managing an airport. This revised airport sustainability approach is referred to as EONS (economic vitality, operational efficiency, natural resource conservation and social responsibility) and adds the operational efficiency component.

Sustainability initiatives adopted by smaller airports, even without a formal sustainability plan, include the following:

- Lighting upgrades, including LED
- Solar and geothermal energy systems
- Recycling of municipal and construction waste
- Planting trees and native plants (while maintaining a wildlife mitigation awareness)
- Community and stakeholder outreach
- Employee programs
- Funding from nontraditional sources

ACRP has completed multiple sustainability projects. The most current and relevant to small airports include the following:

- The Sustainable Aviation Guidance Alliance (SAGA) website contains sustainability information and guidance for airports of all sizes.
- *ACRP Synthesis 69: Airport Sustainability Practices—Drivers and Outcomes for Small Commercial and General Aviation Airports* includes case examples for small airports.
- *ACRP Synthesis 77: Airport Sustainability Practices* compiled information about airport sustainability for inclusion in SAGA.
- *ACRP Report 80: Guidebook for Incorporating Sustainability into Traditional Airport Projects* identifies opportunities to include sustainability in airport practices and has an evaluation tool.
- *ACRP Report 110: Evaluating Impacts of Sustainability Practices on Airport Operations and Maintenance* provides a tool for airports to estimate the costs and savings of sustainability measures. This tool is most applicable to airports that wish to take their sustainability practices a step further and gather the data needed to use the tool.

One of the key attributes of airport sustainability practices is their versatility and utility as ad-hoc initiatives. Airports can exercise flexibility in selecting, implementing and measuring the effects of various initiatives, such as energy reduction, building automation or use of energy-efficient lighting as part of a project's implementation or as stand-alone initiatives. These ad-hoc initiatives offer an opportunity to engage in airport-sustainability practices that best align with your airport and its environment.

One of the most frequently identified barriers to the implementation of sustainable initiatives is funding. Airport managers should seek innovative grant opportunities, which may be available as a part of state and federal programs that promote environmental sustainability. Because certain sustainability initiatives have cost reduction elements, a potential to generate revenue or the potential to create employment opportunities, state and local economic development agencies may be another potential source of funding. Certain sustainability projects may also qualify for grants through initiatives aimed at developing rural or underdeveloped areas. Sustainability measures that reduce costs may also be easier to pursue from a financial perspective.

For commercial service airports located in the nonattainment area, the FAA has VALE grants available.

Community engagement can create additional opportunities to grow support for sustainability initiatives that improve the quality of the community or generate community goodwill for the airport. Airport managers should seek to engage with community stakeholders and establish community goals for the airport. Moreover, community support and goodwill are key to promoting initiatives' continued implementation and potential enhancement.

To foster community support and engagement, airports should focus on easy-to-implement programs ("low-hanging fruit" opportunities), such as entry-level energy audits, asset management and energy-efficient designs. To translate these efforts into positive community support and a foundation for continued implementation and enhancement, the airports should track, document and communicate their successes to stakeholders. *ACRP Synthesis 21: Airport Energy Efficiency and Cost Reduction* focuses on energy efficiency improvements occurring at airports that are low cost with a short period for the return on investment.

## LED Considerations

One of the areas of "low-hanging fruit" in sustainability for many airports is lighting efficiency. Technological advancements in lighting have benefitted numerous airports seeking to upgrade their incandescent lighting systems. Specifically, the use of the LED systems has become more frequent and commonplace. FAA Advisory Circular 150/5345-53: Airport Lighting Equipment Certification Program establishes the criteria for certifying and receiving FAA approval for the implementation of LED solutions. Airfield lighting manufacturers have developed and are improving LED systems to meet these requirements. The availability of LED systems provides two key potential benefits for airport operators seeking to improve facility sustainability:

- Improved longevity of LEDs: LEDs offer more than double the lifespan of comparable incandescent products.
- Significantly lower electrical consumption of LEDs: LEDs have lower levels of electrical demand and are more efficient than incandescent counterparts, saving the airport money.

Although some LED designs have been approved for airport use by the FAA, the organization is continuing to research and work toward approval of an additional array of lighting solutions for approach and runway lighting systems. As LED systems for airports evolve, the lighting industry is working to overcome some of the issues with light brightness and dimming. *ACRP Synthesis 35: Issues with Use of Airfield LED Light Fixtures* and *ACRP Report 148: LED Airfield Lighting System Operation and Maintenance* contain valuable information and considerations for LED implementation and maintenance on airports.

## Sustainable Design and Operations

Sustainability and "green" measures can be incorporated into the design of airport facilities and projects during the development of project concepts and design stages. Generally, incorporating sustainability measures in the original design will save financial resources in the long run. However, sustainable design is best carried out in a stakeholder-driven environment. It is critical that the process involves, at a minimum, the following:

- Identification of critical stakeholders: Airport management, operations and maintenance staff, tenants and users, local government officials and staff, members of federal and state entities and community interests.
- Establishment of sustainable-design goals and associated implementation strategies: Focus on the specific project planning, design and construction strategies that would meet project

requirements, while incorporating sustainable measures, such as resource-efficient designs or construction strategies that reduce waste or minimize environmental impacts.
- Building consensus and balance around sustainable strategies and project design and construction requirements: Engage the stakeholders in a consensus-building process that ensures that the project requirements and goals—including the budget—are met, while promoting sustainable strategies that constitute the elements of the TBL and EONS models.
- Measuring and communicating results and successes: Continued implementation of ongoing sustainable strategies, and the likelihood of sustainable-design approvals in the future, hinges on the success of previous projects. Always communicate the successes of sustainable projects, whether those successes resulted in savings or revenue generation or reduced impacts to the environment or the community.

While LEED certifications are a recognized and frequently used credential for building projects, smaller airports should weigh the costs and benefits of documenting LEED compliance for certification purposes, as opposed to selecting the most cost-effective measures, to achieve the stakeholder and airport goals within the budget. Envision provides a similar certification tool for site or civil types of projects.

The construction of new airport buildings is costly. Moreover, modern building systems such as heating and cooling, lighting automation, fire suppression and electrical are comprehensive and complex. Therefore, Cx or RCx, as well as energy audits and master planning practices, should be included as a part of project planning and implementation to ensure that the various building systems are operating to the airport's desired specifications and at peak efficiency. The optimization of building systems through the Cx or RCx process starts well before the experts who provide those services investigate the building automation systems and does not end when the project report is issued. The process of finding and, more importantly, implementing energy-saving measures should be developed with buy-in from the building owner or operator in mind. Therefore, facility improvement measures (FIMs) identifying the issues, proposed resolutions and projected and actual savings (where available) should be tailored to each facility, based on stakeholder input.

Energy audits and energy master planning can take the Cx or RCx FIMs to the next level by allowing the facility operators to plan future asset-improvement measures and associated savings. These types of audits offer a lower-cost solution to identify ways in which airport buildings and facilities may not be performing to specifications and where the airport's energy consumers may be operating inefficiently and plan future FIMs for implementation. Because of the relatively low cost of energy audits, they can offer a substantial return on investment for airports with numerous buildings and heating-and-air-conditioning spaces.

To enhance the findings of the aforementioned studies, additional measures should be considered to adequately document, track and analyze the life cycles of the various capital assets on the airport. The intent of this process is not only to identify items that are potentially nearing the end of their useful lives but also to potentially pinpoint any trouble areas within the system design that result in premature asset failure. Using asset monitoring and management as a best practice for operations and maintenance can render long-term sustainable benefits by improving the maintenance process from reactive to predictive.

Airports may also benefit from engaging in water-efficiency planning, with a focus on evaluating the measures that can be designed and implemented to extract the maximum benefit in water and energy cost savings. Extensive information on this topic can be located in *ACRP Report 154: Water Efficiency Management Strategies for Airports*. Airports can also consider green stormwater infrastructure, as addressed in *ACRP Report 174: Green Stormwater Infrastructure, Volume 1: Primer* and *Volume 2: Guidebook*.

## Implementing and Promoting Sustainability Programs

As the impact that human actions have on our natural environment has become better understood, organizational sustainability programs have shifted from their status of a public-goodwill or social-consciousness measure to a programmatic approach designed to promote organizational competitiveness. Products and goods that promote sustainability continue to become more affordable and have started to compete in the same marketplace with more conventional products. While sustainable practices have gained faster traction in the private sector due to their utility as cost-savings measures, or even as a way to promote the company's corporate image, public and governmental organizations have been slower to adopt such programs. In a great majority of organizational situations, implementing sustainability programs is almost exclusively a top-down measure. They require complete buy-in and commitment from the airport sponsor, leadership, airport management and, at times, the community.

As such, promotion should involve the community as stakeholders of the airport's vision. The greatest challenge to the implementation dynamic is the airport management's buy-in on being the best airport the community wants it to be and not necessarily the best airport that management wants it to be. In some cases, such visions are harmonious, but in many situations, understanding community desires and limitations that arise from conflict with the community must be reconciled. The social sustainability aspect of the TBL and EONS models centers on this combination of airport and community visions.

As previously mentioned, identifying stakeholders and gaining a clear understanding of their priorities in the process of sustainable design and operations is the first step of stakeholder buy-in and consensus building. This approach is no different for implementing sustainable programs when it involves management buy-in. Developing an approach to implementing sustainable programs within the airport organization begins with a focus on management's priorities:

- Is the airport attempting to improve the community image and generate goodwill?
- Are there fiscal savings or implications?
- Will this program improve the environmental situation locally or beyond, or result in a reduced long-range environmental regulatory burden?

Each situation is unique and requires a keen understanding of the organizational and stakeholder priorities and dynamics. The ultimate goal is to evaluate those priorities and design a program that is focused on the desired long-term outcomes. Scalable measures are important to calibrate the approach and respond to changes in the airport's leadership and community dynamic without losing progress.

One state that is a leader in GA sustainability is Colorado, which developed the Colorado General Aviation Sustainability Program to provide guidance and resources to assist airports in developing their own sustainability programs. Florida also has published sustainability guidance, the Florida Airport Sustainability Guidebook, intended to provide a standardized methodology for developing and implementing a sustainability plan. The Chicago Department of Aviation was one of the first to address sustainability at airports with the development of its Sustainable Airport Manual. While tailored to a large airport, many of the concepts could also be scaled to smaller airports. The FAA's airport sustainability web page includes links to completed sustainability master plans and airport sustainability plans. Some of the participating airports are small airports.

## 5.10 Project Implementation

### Key Insights

*The implementation of an AIP-funded project starts several years before construction.*

*Grant programming is usually carried out about 3 years in advance of a project.*

*Proper grant administration requires good record keeping during the project and is important for timely payments and grant closeout.*

### Key Definitions

**Airport Improvement Program (AIP)**: A program that provides financial grants to primarily public agencies for the planning and development of public-use airports that are included in the National Plan of Integrated Airport Systems.

**Airport layout plan (ALP)**: A set of drawings that provide a graphic representation of a long-term development plan for an airport, showing the boundaries and proposed additions to all areas owned or controlled by the sponsor for airport purposes, the location and nature of existing and proposed airport facilities and structures and the location of existing and proposed nonaeronautical areas and improvements.

**Construction safety and phasing plan (CSPP)**: A document that outlines procedures to maintain operational safety on an airport during construction projects. CSPP identifies how to minimize construction impacts on operations.

**Modification to standards (MOS)**: Any approved nonconformance to FAA standards to airport design, construction or equipment procurement. MOSs are issued by the FAA on a case-by-case basis after it is demonstrated that an acceptable level of safety, economy, durability and workmanship would still exist.

**Obstruction Evaluation/Airport Airspace Analysis (OE/AAA)**: A public website provided by the FAA to enable individuals and organizations engaged in sponsoring the construction or alteration of potential obstructions on and off airport property to easily notify the FAA of their intents and activities. This allows the FAA to evaluate the impacts of these activities on the airspace system.

**Substantially complete**: When a project is sufficiently complete in accordance with the contract documents so that the owner can occupy or use the project for its intended purposes.

### AIP Project Flow

The first step in the process to obtain an AIP grant for a development project is to have the development included on the airport's approved ALP. Once the project is part of the ALP, it must be included on the airport capital improvement program (ACIP) request for AIP funding. While the ACIP may show the airport sponsor's desired timing for the project, the actual timing may vary, based on a number of factors.

The environmental documentation for an AIP-funded project should be completed by the end of the federal fiscal year prior to the anticipated year of the project initiation.

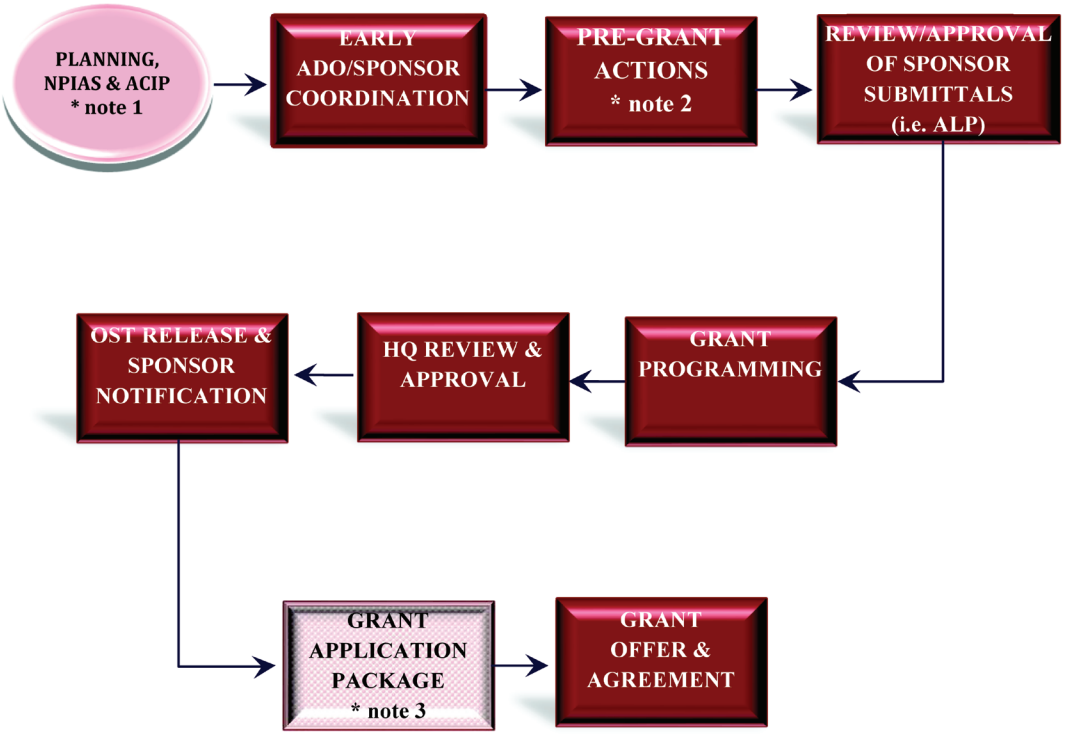
Factors that impact the timing of the project are airspace approval, typically via the ALP; environmental approval via a CATEX, EA or EIS, as appropriate for the project; justification of need; priority of the project within the airport system, as determined by the FAA's priority rating; and the availability of grant funding. Close coordination with your state block-grant

representative or FAA ADO program manager is important through the process of moving a project from concept to implementation. Depending on FAA's priority rating for the project, it may take several years for a project to be programmed for funding or an airport to build up nonprimary entitlement funding sufficient to cover the project.

## Grant Application

When a project is anticipated to receive AIP funding, the airport sponsor must submit a grant application. FAA Standard Operating Procedure 6: FAA Review and Approval of an Airport Improvement Program (AIP) Grant Application outlines the steps and required documents in the application packet. For nonprimary airports in a block grant state, the grant application is typically processed by the state, with lessor documentation required from the airport to the state aeronautics agency. FAA SOP 6 includes a flowchart of the AIP grant process, shown in Figure 14.

There are some tasks in the AIP grant process over which the airport sponsor has control: the early coordination, pre-grant actions and submittal of a timely and complete grant application. The timing of the grant offer and agreement is driven by FAA and federal approvals. This includes the notification by the U.S. DOT's Office of the Secretary to congressional officials from the




**NOTES:**
1. Project need and justification established. Requirements of applicable environmental laws and regulations are discussed and considered during early stages of planning
2. Typical activities: airspace study, initiate PERADA, ALP, environmental
3. Submittal of the grant application (and components thereof) can vary but package must be complete and accurate prior to grant offer

Source: FAA SOP 6.0: FAA Review and Approval of an Airport Improvement Program (AIP) Grant Application, October 1, 2015

***Figure 14. Flowchart of AIP grant process.***

airport's area to provide an opportunity for the elected officials to publicly announce the grant. The FAA Central Region's Checklist for Typical AIP Development Projects shows the overall flow and timing of the various phases of an AIP-funded project.

As identified in FAA SOP 6, the grant application package must contain the following:

- Standard Form 424: Application for Federal Assistance (for all types of projects), executed by the appropriate sponsor representative
- Form 5100-101: Application for Federal Assistance, with the appropriate parts completed based on the type of project, which includes project costs with no contingencies and a brief, narrative description of the work for development projects
- Project sketch for development projects
- Documentation for determination of reasonableness of costs as applicable to the project, such as bid tabulations, property appraisals and negotiated consultant agreements
- Exhibit "A" property map, if not already on file with the FAA
- Plans and specifications by reference for a development project

## AIP Development Project Implementation Process

### *Design Phase*

The first step in the design process is to select the design consultant and execute a design contract. The consultant selection must meet the FAA requirements, as outlined in FAA Advisory Circular 150/5100-14: Architectural, Engineering and Planning Consultant Services for Airport Grant Projects, for the design cost to be AIP eligible. If the construction of the project is anticipated to immediately follow the design and bidding of the project, the professional services contract with the consultant may include both the design and construction phase services.

The recommended steps for a project's design and construction processes are described in FAA Advisory Circular 150/5370-12: Quality Management for Federally Funded Airport Construction Projects. *ACRP Report 116: Guidebook for Successfully Assessing and Managing Risks for Airport Capital and Maintenance Projects* provides a step-by-step process for evaluating and managing project risks throughout the various phases of a project.

**Pre-design Meeting.** When starting the design process, you may find it helpful to hold a pre-design meeting, the purpose of which is as follows:

- Introduce stakeholders, sponsors and the design team
- Review the project scope of work and available budget
- Establish the schedule for design and anticipated construction
- Receive input upfront from staff or key tenants affected by the project with respect to possible issues or challenges to be addressed during the design phase

**Design Review Meetings.** During the design process, meetings should be conducted with the design team, airport staff and key tenants affected by the project. The purpose of these meetings is to share the progress of the design and address any questions. Milestones that are commonly used for design review meetings are 30/60/90 percent or 50/90 percent completion for less-complex projects. Generally, the difference between 90 and 100 percent completion is the final acceptance review of the design documents by the airport sponsor, state aeronautics agency and/or FAA and incorporation of any comments into the design documents prior to the engineer-of-record affixing his or her seal and signature. The design documents will usually consist of a set of construction plan drawings and contract documents consisting of general, technical and special provisions and a bid-proposal package.

**Engineer's Report.** The engineer's report will be produced during the design process. The engineer's report typically describes the following:

- The scope of the project
- Any design alternatives considered and the rationale for those selected
- Design details: pavement design, drainage design and electrical design to show compliance with FAA or state requirements
- Any deviations to design standards
- If federally funded, identification of any items not eligible for federal funding
- Estimate of probable construction cost
- Special considerations for local circumstances, such as available materials, equipment and contractors
- Any provisions included in the project to meet environmental mitigation commitments

The Illinois DOT's Division of Aeronautics includes a good checklist for the content of an engineer's report as part of its standard contract agreement.

**Project Specification.** For a project funded with an AIP grant, airport sponsors are required to use the construction specifications, as defined in FAA Advisory Circular 150/5370-10: Standards for Specifying Construction of Airports. This advisory circular provides the requirements and the allowable options to align the specifications with local conditions or locally available materials. Some states have developed and received FAA approval for state specifications to use at non-primary airports. Any changes to the guidelines provided in FAA Advisory Circular 150/5370-10 require FAA-approved modifications to standards, which often involve a lengthy review process that must be accounted for in the project schedule.

*Buy American Preference.* One key provision that must be included in AIP-funded projects is the Buy American Preference. This provision requires all steel and manufactured goods used in AIP projects to be produced in the United States. The FAA has the authority to waive the Buy American Preference under certain circumstances. *ACRP Legal Research Digest 18: Buy America Requirement for Federally Funded Airports* discusses the legislative history, applicable federal regulations and how it has been applied at airports.

*Airport Lighting Equipment Certification Program.* To be eligible for federal grant assistance, airport sponsors must purchase equipment certified under the Airport Lighting Equipment Certification Program. FAA Advisory Circular 150/5345-53: Airport Lighting Equipment Certification Program describes how manufacturers can buy equipment qualified under the program.

*Construction Safety and Phasing Plan.* During the design process, the consultant is required to develop a CSPP for AIP-funded projects. The CSPP identifies how to minimize construction impacts on airport operations. The CSPP will be submitted with the design plans to the FAA for review. FAA Standard Operating Procedure 1: FAA Evaluation of Sponsor's Construction Safety and Phasing Plans Funded by the AIP or PFC Programs identifies the information required to be part of the CSPP. FAA Advisory Circular 150/5370-2: Operational Safety on Airports During Construction provides guidance for developing the CSSP.


For Part 139 airports, meeting the requirements of FAA Advisory Circular 150/5370-2 is an acceptable method for complying with Part 139 requirements. During construction, Part 139 airports will likely need to increase the airport inspections, particularly special inspections, such as those tied to the reopening of construction areas for airport operations.

*DBE program.* To ensure a level playing field for DBE firms to compete, 49 CFR Part 26 requires nondiscrimination in the administration of airport financial assistance programs.

Airport sponsors establish an overall DBE participation goal covering a 3-year fiscal period if anticipating awarding FAA-funded prime contracts with a cumulative total value that exceeds $250,000 during any one or more of the fiscal years within the 3-year goal period. Eligible DBE firms must be certified by a state-unified certification program agency. Airport sponsors must make a good-faith effort to meet the overall goal, which is accomplished by including a DBE participation goal in the project's contract documents.

At primary and commercial service airports, there is also an airport concession DBE program.

*Establishing wage rates.* On federally funded projects of more than $2,000, the project must be constructed using Davis–Bacon wage rates. These wage rates are included as part of the specifications. The Davis–Bacon wage determinations are available from the Wage Determinations Online website. The wage determination should be obtained just before advertising the project for bidding, so that it shows the current wage rates. On state-funded projects, the airport sponsor should determine if there are any state wage rate requirements.

**FAA Plan Review.** The FAA ADO or state block-grant agencies on behalf of the FAA are required to review design plans. Time for the FAA plan review must be included in the project schedule in advance of bidding the project. The plans should be submitted for review at least 60 days in advance of the planned bid date to avoid delays. The FAA has varying levels of plan review, as detailed in the August 2, 2016, memorandum for FAA Review of Construction Plans and Specifications for AIP-Funded Projects. Project description requirements for plan reviews are the same as project descriptions for the FAA National Priority System. The FAA has an AIP project plans and specification certification form to be submitted with the plans.

**Public Bid Process.** After the design plans are reviewed by the FAA, the procurement of bids can occur. Airport sponsors should follow the requirements of their state or local government for the procurement of airport construction projects, which are usually considered public works projects. The public bid process starts with the advertisement of the project and concludes with a public opening of bids. An airport may hold a prebid meeting during the bidding process to explain the project's scope and anticipated special circumstances or challenges for bidders to consider and to provide contractors with the opportunity to see the project site. A formal process is also used to allow contractors to submit questions and receive answers, usually through a written addendum issued by the airport sponsor.

### *Construction Phase*

**Preconstruction Meeting.** Before the contractor starts work, a coordination meeting with the key contractor and subcontractor personnel; airport sponsor and staff; consultant, state and/or FAA staff; airport users, tenants and stakeholders affected by the project; testing laboratory staff; and utility companies affected by the project, as applicable, should occur. Key topics to be addressed at a preconstruction meeting, as identified in FAA Advisory Circular 150/5370-12, Appendix D, include the following:

- **Primary points of contact**: For the owner and the contractor, plus the contacts' roles and responsibilities and whether the contractor is required to go through the airport sponsor for communications with airport users and tenants
- **Scope of work**: Proposed work, schedule and phasing, and any standing or required meetings
- **Notice to proceed**: Required approvals for construction to begin
- **Safety and compliance with CSPP**: Review of CSPP and safety procedures to make sure all parties are aware of the project requirements for construction on the airport
- **Security and FAR Part 139 issues**: As applicable, to meet airport and/or TSA requirements

- **NOTAM issuance and note to FAA Technical Operations**: By airport, as applicable, and advance notice required
- **Contractor's quality control plan**: Required for some projects with quality control testing, such as paving projects; should be submitted before preconstruction meeting
- **Project documentation**:
  - **Retaining documents for audits**: Keep good records throughout and after construction to document the basis of payments
  - **Submittals**: Required prior to work and reviewed based on project specifications
  - **Request for information**: Formal process to be followed for the contractor to submit questions on plans and specifications and the airport sponsor to provide a response
  - **Record drawing**: Requirement for the contractor to make a set of plans that include any changes made in the field and final quantities of material, so that they can be recorded as part of the project closeout
- **Compliance with regulatory requirements**: Identification of requirements to meet and documentation related to regulatory requirements, such as Davis–Bacon wage rates, NPDES and other permits, DBE participation
- **Utility identification**: Utility locations, including airport and FAA cables, before initiation of work

**Construction Coordination Meetings.** Additional coordination meetings are recommended to be held throughout the project. Depending on the complexity of the project, standing coordination meetings may be held weekly or fortnightly. These meetings should provide updates on the job to date and a 1- to 3-week forecast to identify potential issues and proactive resolutions. Pretask meetings for significant tasks, such as a prepave meeting, are also recommended. The FAA requires AIP projects to have weekly construction progress reported on FAA Form 5370-1: Construction Progress and Inspection Report.

**Final Inspection.** When the contractor substantially completes construction, an on-site final inspection will be conducted. This final inspection will include the contractor, airport sponsor and design or construction consultant. It may also include the state aeronautics agency, the FAA or both. The inspection will review the contractor's work for conformance with the plans and contract documents. Any item that needs correction or adjustment will be put on a punch list for the contractor to complete. When completed, the punch-list items will be inspected by the airport sponsor and design or construction consultant, at a minimum. Once the punch-list items are accepted, the contractor can submit an invoice for final payment. Before processing the payment, the airport sponsor should be sure it receives all required documentation from the contractor, such as red-line, marked-up drawings for the as-built record drawings, summary of DBE participation and waiver of lien from the contractor. As the recipient of the AIP grant, the sponsor has the responsibility and obligation to conform to the FAA documentation requirements and grant assurances. A contractor's final payment and retainage are a sponsor's best leverage to ensure the contractor will provide the necessary items.

**Construction Closeout.** At the end of the project, there is a construction closeout to ensure the project is completed in reasonable conformance with the construction documents, and all project documentation is retained. A final construction record should be compiled by the construction consultant, which includes all project documentation in one place, often in a binder, CD or thumb drive, as preferred by the airport sponsor. FAA Standard Operating Procedure 10: Administrative Closeout of Airport Improvement Program Grants identifies the FAA process and required documentation to close a grant. For the FAA to close a grant, the grant should be physically complete, its administrative requirements met and its financial actions processed.

As part of preparing the final construction record, any as-built changes to the ALP should be completed and submitted to the FAA.

**Change Orders.** If there is a change in the quantity of work during a project due to items such as unforeseen conditions, a written change order is used to authorize the contractor to proceed with the additional work. Any change orders are best coordinated in advance with the FAA ADO or state agency for state block grants. Per Section 5-35 of FAA Order 5100.38: Airport Improvement Program Handbook, all change orders, supplemental agreements and contract modifications must eventually be reviewed by the FAA ADO or state agency for a block grant state. If a sponsor proceeds with a contract change without prior approval from the FAA or state, it is at the sponsor's risk. The FAA's review process for construction change orders is outlined in FAA Standard Operating Procedure 7: Airport Improvement Program Construction Project Change Orders.

### *AIP Grant Payments*

If a consultant prepares a payment application, it is still the airport sponsor's responsibility to ensure all payment requests are accurate and meet the grant payment requirements.

For small airports that are primary or nonprimary and not part of a block grant state, the airport sponsor is responsible for making payment requests to draw funds from the grant. Many small airports may have their consultants assist in this process. FAA Airports' AIP Grant Payment and Sponsor Financial Reporting Policy outlines the process and requirements for grant payment application, review and payment. Nonprimary airports in states participating in the FAA's state block-grant program must coordinate with their state aeronautics agencies to identify their AIP grant payment process.

As detailed in the AIP Grant Payment and Sponsor Financial Reporting Policy, the FAA uses the DOT Electronic Grants Payment System, Delphi eInvoicing, unless an airport sponsor demonstrates it is unable to use or access the internet to register and process payments through Delphi eInvoicing. To access Delphi eInvoicing, the airport sponsor's authorized users must complete the eAuthentication process. Airport sponsors may authorize multiple users and may designate someone other than the airport sponsor to prepare and save payment requests on the airport sponsor's behalf. However, an airport sponsor must review the work of a designee for accuracy before the sponsor submits the payment request. The frequency of grant payment requests will vary depending on the type of project. Monthly is typical for an active project. If there is no payment request, also known as a "grant draw down," for more than 12 months, a grant is considered inactive and it can be a cause for the grant to be terminated.

An airport sponsor must only request payment in the amount of allowable project costs that have been completed. This refers to costs for which the sponsor has been invoiced or has paid. All payment requests must include an invoice summary identifying the following:

- Contractor (construction or professional service) name
- Date and number of invoice
- Billed amount
- Breakout of AIP and non-AIP costs
- Worksite name
- Summary of services/material billed

Airport sponsors identified under the FAA's revised Airport Improvement Program (AIP) Grant Oversight Risk Model Policy may also be required to include the contractor pay request and sponsor certification letters and other supporting documentation. The FAA's approval process for grant payment applications also varies based on a sponsor's grant payment risk level, ranging from auto-approval up to 90 percent of the federal share to a manual approval with multiple FAA staff approvals, including an FAA Airports regional or district office manager. If the FAA payment request review results in a rejection of a payment application, the entire payment must be rejected. The rejection notice must include the reason for the rejection and the corrective action required. Once corrected, the airport sponsor must submit a new payment request in Delphi eInvoicing.

Payments will not be made for more than 90 percent of the federal share until the FAA determines that a project is substantially complete. Once a project is determined to be substantially complete, an airport sponsor can receive up to 7.5 percent of the remaining 10 percent of the federal share. The final 2.5 percent is not approved until all required closeout documentation is received by the FAA. If a sponsor receives a grant amendment increasing the grant amount, the 90 percent is applied to the increased amount. The FAA may also hold a payment request if an airport sponsor is in noncompliance. If an improper payment is submitted in Delphi eInvoicing, an airport sponsor must immediately contact its FAA Airports regional or district office for it to be rejected. If the payment has already been processed, a credit memo or refund to the federal government by the airport sponsor is needed as detailed in the AIP Grant Payment and Sponsor Financial Reporting Policy.

Once payments are approved in Delphi eInvoicing, they are paid though electronic funds transfer to the airport sponsor's bank. Airport sponsors should receive their payments within 2 business days of approval.

## Grant Amendment

As described in FAA Order 5100.38, Chapter 5, Section 7, AIP grants can be amended for airport development or land acquisition projects. Planning project AIP grants may not be amended. When there is uncertainty in a planning project, the project may be conducted in phases to allow for the availability of additional information to better determine the cost before obtaining a grant for a future phase. Generally, an AIP grant is amended for cost or project scope, not both.

An airport sponsor is required to submit an amendment request in writing and document the amount and justification. For most types of projects, an amendment is limited to a 15 percent increase; again, planning projects are not eligible to be amended. Land acquisition at non-primary airports has a separate limit of the greater of 15 percent of the grant amount for land (federal share) or 25 percent of the total increase (project cost that is not federal share) in land costs, as detailed in FAA Order 5100.38, Table 5-28: Grant Amendment Limits for Increases. State block grants are not amended to increase the grant amount. Normally, a grant is amended at closeout to adjust the grant to reflect final costs, but the FAA can amend a grant more than once and at times other than closeout.

## Grant Closeout

FAA Standard Operating Procedure 10: Administrative Closeout of Airport Improvement Program Grants establishes the procedures to close an AIP grant. For block grant state airports, the grant closeout process should be coordinated with the state aeronautics agency. FAA Standard Operating Procedure 10 includes a sponsor grant closeout worksheet. While optional, this worksheet can help an airport sponsor complete all submittals required to close an AIP grant. The closeout submittals vary with the type of project. FAA Order 5100.38, Chapter 5, Section 8, details the grant closeout requirements, which fall into the following basic steps:

FAA policy states that AIP grants should not be open more than 4 years.

- Physically complete all projects within the grant
- Complete all grant administrative and financial requirements
- Complete the closeout process steps

## Airports GIS Data

If a construction project changes the airfield, in particular, safety-critical data such as runway length, width, taxiway alignment or navigational aids, a survey meeting the requirements of the

FAA Airports GIS is required of the completed facilities. This survey data must be submitted to the FAA Airports GIS website. If a project such as a runway overlay does not change the runway end elevation by more than 1 foot, no update is required.

## FAA Forms 7460 and 7480

The requirement to file a Form 7460 does not automatically mean the development will be objectionable because the filing requirements are more stringent.

Proposed construction on or in the vicinity of an airport requires the filing of an FAA Form 7460-1: Notice of Proposed Construction or Alteration. This includes on-airport construction at any public-use airport listed in the FAA's Chart Supplement. FAA Form 7460-1 is filed through the FAA's OE/AAA website. This form should be filed at least 60 days in advance of the project. The status of a filing can be checked through OE/AAA. An airport can register to receive notice of OE/AAA filings based on the state or airport specified. The result of the FAA's review of Form 7460-1 is a finding of no objection, conditional determination or objectionable.

FAA Form 7480: Notice for Construction, Alteration and Deactivation of Airports is used to notify the FAA of any changes to the status or use of a civilian or civilian-owned, joint-use airport. This includes construction, alteration or activation of any runway or taxiway or deactivation of any runway or taxiway. Thus, if a project adds, removes or changes a runway or taxiway, a Form 7480 may also be required to be filed with the FAA.

## 5.11 Land Acquisition Process

### Key Insights

*Under certain circumstances, airports may need to acquire land to obtain sufficient property for a development project or to promote land-use compatibility, whether noise or safety related.*

*Certain land acquisition projects are eligible for federal grants; however, federal real property acquisition and relocation regulations must be strictly adhered to.*

*Prior to undertaking a land acquisition project, airport managers must be familiar with the federal and state regulations pertaining to property acquisition, relocation assistance and disposition of surplus properties that were subject to federal funding for property acquisition.*

*The airport sponsor, following the acquisition of a fee-simple title to real property, is required to address liabilities and obligations as property owner, including property maintenance, the demolition or salvage of improvements, the sale of improvements and overall property management.*

*Land purchase options are a viable, low-cost solution to avoid the escalation of acquisition costs in the early project planning and design phases.*

*Land purchased through the FAR Part 150 noise-compatible land process will have its own associated federal requirements that will follow the property.*

### Key Definitions

**Avigation easement**: A type of acquisition of an interest in land or property that involves less than fee simple purchase. One form of avigation easement grants an airport the right to perform aircraft operations over the designated property, including operations that might cause noise, vibration and other effects. A stronger form of easement is a deed restriction that may include the right to perform aircraft operations on the property or the public acquisition of a landowner's rights, restricting future development of the property for any use more intensive than that existing at the time of the transaction. This easement may also include prohibitions on the uses for which the property may be developed. The maximum heights of structures and other objects may also be specified.

**Fair market value (FMV)**: An estimate of the market value of a property, based on what a knowledgeable, willing and unpressured buyer would probably pay to a knowledgeable, willing and unpressured seller in the market.

**Fee simple ownership**: Considered full property ownership in land wherein the owner has the exclusive right to use it, exclusively possess it, commit waste upon it, dispose of it by deed or will and take its fruits.

### Complying with Federal, State and Local Requirements

While state and local jurisdiction requirements may vary, federal government requirements for land acquisition using federal funds are stringent, subject to 49 CFR Part 24, Uniform Relocation Assistance and Real Property Acquisition Act, also known as the Uniform Act or URA. The URA, passed by Congress in 1970, is a federal law that establishes minimum standards for federally funded programs and projects that require the acquisition of real property or displace persons from their homes, businesses or farms. Protections and assistance afforded by the URA apply to the acquisition, rehabilitation or demolition of real estate for all federal or federally

funded projects. The primary purpose of the act is to provide fair and equal treatment to all persons subject to real property acquisition and displacement as a result thereof.

The FAA guidance for land acquisition is provided in FAA Advisory Circular 150/5100-17: Land Acquisition and Relocation Assistance for Airport Improvement Program Assisted Projects. Appendix Q: Land Projects of FAA Order 5100.38 also identifies the requirements for AIP-eligible land acquisition projects. FAA Order 5100.37: Land Acquisition and Relocation Assistance for Airport Projects details the FAA's responsibilities to monitor airport sponsor compliance. The FAA provides additional guidance for land acquisition on its web page of Acquiring Land for Airports and Relocation Assistance. Because the requirements of the URA must be met for a land acquisition project to receive an AIP grant, airport sponsors should coordinate any projects involving land acquisition with their FAA ADO. The FAA Central Region has a checklist for typical AIP land acquisition projects.

When state funding for property acquisition is involved, the process may be subject to the specific requirements of state law. Airport sponsors should work closely with their local planning or zoning authorities to determine the suitability of property subject to acquisition considerations from the standpoint of legal encumbrances, environmental concerns and land-use planning or zoning considerations that may be part of local or state law requirements.

The release of obligated airport property for the purposes of sale also invokes federal requirements related to surplus property disposition, which is discussed later in this chapter.

## Fee Simple, Ground Lease or Easement Acquisition Considerations

During the planning stages of a project that involves property acquisition, the airport manager must determine the most suitable means of acquiring the property or property rights needed. The planning should balance the cost of property acquisition, availability of funds for the acquisition, disposition of the property owners toward acquisition of their property and project needs.

For most development projects, fee simple property acquisition may be the only means of obtaining the necessary real property to execute the project. For purposes of mitigating obstructions or noise or meeting airport design criteria, fee simple acquisitions generally grant the airport a higher degree of certainty ensuring that the measures undertaken will be enforceable in perpetuity. The most substantial negatives to this approach are the cost of fee simple purchase, as well as the multitude of legal requirements associated with the acquisition. Per FAA Order 5100.37, if the fee simple purchase includes improvements that will be permanently vacated, the airport owner should implement procedures to remove them as early as practicable or otherwise keep under protective surveillance.

Acquisition of an easement allows the airport sponsor a degree of control over certain aspects of the property or protection from liability when fee simple acquisition of the property is not possible, necessary or financially feasible. Easements can be acquired for hazard prevention or nuisance mitigation purposes and, unless otherwise specified, generally remain with the property, regardless of ownership changes. Most avigation easements prevent property uses that may serve as a wildlife attractant, permit vegetation to grow to heights that exceed critical airspace surfaces or would otherwise be incompatible with the current or planned use of the airport. Typically, language contained in the easement agreement would specifically preclude uses such as landfills or transfer stations intended for the storage or processing of putrescible waste, stormwater retention ponds, creation or expansion of wetlands or planting of crops that would serve as bird attractants.

While legally enforceable and less expensive than fee simple acquisitions, the costs of avigation easements are more challenging to estimate because of the more arbitrary nature of the pre- and

post-easement property value appraisals. Additionally, avigation easements provide less control over the property than fee simple acquisitions.

During the process of selecting the most appropriate approach to obtaining property for project implementation, utility easements are often overlooked. Airport management must work closely with local government contacts and coordinate the process with local utility companies to identify utility easements. If conflicts with project requirements are identified during the process of discovery, the cost to resolve such conflicts should be included as part of the associated development costs.

The selection of the most appropriate approach to obtaining the property for project needs will depend on a broad range of variables. It should also include extensive consultation with the funding agencies on matters of eligibility and to preclude any potential regulatory complications or delays.

## Environmental Due Diligence Audits

The Environmental Due Diligence Audit (EDDA) program is conducted in accordance with FAA Order 1050.19: Environmental Due Diligence Audits in the Conduct of FAA Real Property Transactions, which aims to minimize potential environmental liabilities as a result of real property transactions. The purpose of the environmental audit is to uncover any potential environmental conditions or history of environmental hazards prior to the property being acquired with the use of federal funding. An EDDA is always recommended but is required under the following conditions:

- Purchase or sale of FAA-encumbered property
- Determination by the FAA technical reviewer of sufficient risk to warrant an EDDA
- Suspected contamination on-site or in proximity
- Any real property transactions involving FAA facilities

An EDDA scope would largely depend on the basic knowledge of the subject property, its condition and its surroundings and determines the amount of professional effort required to conduct the audit. The process is conducted in phases.

Phase I of the audit may be composed of activities such as site visits, the review of records and regulatory compliance, geologic and hydrologic surveys and the preparation or review of report information. Phase II includes limited site sampling to confirm the presence or absence of suspected contamination, identified in Phase I. Following the analysis of findings, results of the audit are used to guide the FAA's decisions regarding property acquisition or disposition options.

## 5.12 Land Release/Concurrent Use

### Key Insights

*When airport property is leased or sold for nonaeronautical use, FAA approval is required, regardless of how the land was acquired.*

*An avigation easement will be required to be maintained over property sold by the airport.*

### Key Definitions

**Airport property**: Any property described as part of an airport in an agreement with the United States or defined by an airport layout plan or listed in an Exhibit "A" property map is considered to be obligated property for airport purposes.

**Concurrent use**: The use of aeronautical land for a compatible nonaeronautical purpose, frequently revenue producing, while it serves the primary purpose for which it was acquired.

**Fair market value (FMV)**: An estimate of the market value of a property, based on what a knowledgeable, willing and unpressured buyer would probably pay to a knowledgeable, willing and unpressured seller in the market.

**Land release**: The release of airport property not needed for present or future aeronautical purposes but subject to federal obligations from the terms of the agreement with the U.S. government. It is defined as the formal, written authorization discharging and relinquishing the FAA's right to enforce an airport's contractual obligations.

### Land Release of Airport Property

Any property shown on the Exhibit "A" property map or ALP, or subject to grant agreement obligations with the U.S. government, is considered an obligated property (for aeronautical use) as described in FAA Order 5190.6: Airport Compliance Manual, Chapter 22. An airport sponsor may find that a previously acquired or obligated property may no longer be needed to support aeronautical operations or development at the airport. This can happen for a variety of reasons, such as a change in the character of flying operations at the airport, changes in aircraft design (lower noise) or even changes in airport design criteria. In that event, the airport sponsor may request a portion of obligated airport property to be released from federal obligations.

Land releases fall into two general categories: the release from aeronautical use or the release and disposition of obligated property. In the first case, the airport retains ownership of the land but may use the land for nonaeronautical purposes. In the second case, the property is released for sale or transfer to another entity, and the airport neither owns the land nor has any responsibility to maintain it. Per FAA Order 5190.6, Chapter 22.5, if land is to remain in use for its primary aeronautical purpose but also be used for revenue-producing, compatible nonaeronautical purposes, FAA approval for concurrent use can be requested.

All requests for a release of obligated property should commence with close coordination with the appropriate FAA ADO staff. All requests must be submitted in writing by an authorized representative of the airport sponsor. There is no specific format or form to request a release, but each request, at a minimum, should include the following:

- The legal description of the property and any associated facilities
- Description of how the property was acquired or obtained by the airport, with supporting documentation
- Description of the present property conditions and that of any associated facilities

- Description of all obligating agreements for the subject property
- Description of the type of release or agreement modification requested
- Reasons for release, modification or agreement amendment request
- Anticipated airport use or disposition intent for the property or facilities
- Justification, facts and circumstances for the request
- Description of any applicable state or local regulations that may impact the property following the release (e.g., local comprehensive plan, state airspace protection regulations)

If the property release request involves property disposition, the aforementioned request should be supplemented by the following:

- Description of the property's FMV
- Expected proceeds and revenues from the property disposition
- Comparative analysis of relative advantages of property disposition, as opposed to retention for the purposes of generating rental income
- In the event that the property will not be sold upon release and used for other airport sponsor purposes, a description of how the airport account will be reimbursed for the FMV of the property
- Substantiated description of any anticipated intangible benefits to the airport from the property release, supported by information indicating the merits of the intangible benefits, as opposed to receiving an FMV for the property

The FAA web page on Airport Land Acquisition: Release of Airport Property lists information that must be a part of the release request. Note that when reviewing the request, the FAA will consider only the benefits of the release to the airport, not to the airport sponsor or community. Most of all, the FAA will consider the following:

- Whether the requested release is reasonable and practical
- The way in which the release will affect the aeronautical facilities needed by the airport
- Whether the release benefits civil aviation in general
- Whether the proposed property use will be compatible with the needs of civil aviation

The airport sponsor should accompany the written request with documentation supporting the case for agreement modification or property release, including maps, photographs, airport planning documents and official appraisal reports.

FAA Order 5190.6, Chapter 22, "Releases from Federal Obligations," contains additional information regarding the release process. The local FAA ADO should always serve as the initial point of contact for any airport sponsors considering a property release.

As part of the land-release process, the FAA is required to publish a notification of the release of aeronautical property in the Federal Register. The FAA action to release a sponsor from federal obligations as part of the land release is normally categorically excluded for environmental review, though at times it may require an EA.

At the conclusion of property disposition involving the release of property, all associated airport planning documents, such as the ALP and Exhibit "A" property map must be updated to reflect the changes to airport property and facilities.

If an airport acquires land with only local funds and does not intend to use it for an aeronautical purpose, it should not be included on the ALP.

Additionally, even if the airport property was acquired with only local funds, once it is a part of the airport property listed on the FAA-approved ALP, a release by the FAA is required if the property will be used for a nonaeronautical purpose.

## Disposition of Federal Surplus Property

In the final years of World War II, the U.S. government had to contend with the upkeep and maintenance of a wide range of properties that were acquired or built to support the war effort.

As a result, the Surplus Property Act of 1944 (later amended and codified as 49 U.S.C. §47151–153, the Surplus Property Act) was enacted by Congress. It establishes the standards and rules that provided for the disposition of surplus government property and infrastructure, including airports, to state and local subdivisions.

The Surplus Property Act sets conditions that govern how the federal surplus property may be released by the recipient when it is no longer needed. The conveyance of that surplus real property is subject to terms, conditions and restrictions that were prescribed in the original legal conveyance instruments. Those conditions became the sponsor's federal obligations under the act, requiring the recipient to use conveyed property for aviation purposes in perpetuity. In addition, conveyance of any revenue-producing property federally obligates the public agency recipient to use revenue generated by the property for the operation, maintenance and development of the airport. Chapter 3 of FAA Order 5190.6 addresses federal obligations from property conveyances.

When the airport sponsor or management determines that a need or a desire exists to dispose of (sell) a portion of the airport property, subject to federal surplus requirements, each process should start with contacting the appropriate FAA ADO. The ADO will direct the airport sponsor/management to an FAA compliance specialist, who will establish the extent of obligations associated with the particular property and facilitate the review and coordination of any required documentation. This action and process must be initiated in writing, via a request signed by an authorized representative of the airport sponsor, and is needed for any modifying action of the original airport agreement to accept federal surplus property. A release of federal surplus property needs to address the same items as any other airport property release request; in addition it should identify the nature of the existing agreement with the federal government.

## Concurrent Use of Airport Property

As an alternative to a full land release of airport property, the airport sponsor or management may consider requesting FAA approval for concurrent property use for aeronautical lands that are not used or needed for aeronautical purposes. Concurrent-use approval requires the land to remain designated for aeronautical purposes, but the request needs only FAA approval and not a formal release. Following are additional conditions of such an approval:

- The approved use has to be compatible with airport operations and safety.
- The properties and facilities must continue serving aeronautical purposes.
- Any rental fees received by the airport must be based on the FMV and retained as airport revenue.

Similar to the land-release process, there is no specific format for the request, but it should contain (at a minimum) the following:

- Request cover letter, describing the original intent of the property acquisition (e.g., noise, safety, capacity) and how the proposed concurrent use will not interfere with the original intent
- Explanation of the benefits of the proposed concurrent use
- Property plat of the proposed lease, including the boundary description
- Summary appraisal of the fair market rent, including appraisal of corollary benefits to the airport as a result of the concurrent use
- Copy of the final FAA airspace determination of no hazard (obstruction evaluation or nonrule)
- NEPA compliance documentation
- Draft copy of the lease agreement

Since the concurrent-use approval would potentially permit the airport to utilize the property for revenue-producing purposes, while retaining ownership and interest, this option should be considered as the preferred option before the airport sponsor considers seeking a formal land release from the federal government. Additionally, concurrent-use requests may require less state and local government scrutiny if they do not require changes to the legal status of the property or its land-use or zoning designation.

It is usually preferable for an airport to retain the ownership of property, when feasible, because it can provide a longer-term revenue stream.

## Interim Use of Hangars

Approval for interim use of aeronautical facilities for nonaeronautical purposes can also be requested from the FAA. Per the FAA's Hangar Use Policy, issued June 15, 2016, an airport sponsor can request interim use of a hangar for nonaeronautical purposes for a period of not more than 5 years when there is no aeronautical demand for the hangar. This request needs to include an inventory of aeronautical and nonaeronautical land/uses at the airport, the vacancy rate, an established process for accepting new requests for aeronautical uses and assurance that the facilities can be returned to aeronautical use when there is demand. An airport sponsor can lease the hangar for either a longer term—typically 3 to 5 years, with FAA approval—or, with an initial FAA approval, an airport sponsor may lease the hangars for nonaeronautical use on a month-to-month basis for 30-day consecutive periods without additional FAA approval. Any nonaeronautical rental requires that a fair market commercial rental rate be charged. Aeronautical use must receive priority over nonaeronautical use even if the rental rate would be higher for nonaeronautical use.

## 5.13 Airport User Surveys, Benchmarking Studies and Peer Reviews

### Key Insights

*While each airport is unique, benchmarking provides a means to evaluate how an airport compares to competitive or comparable facilities.*

*Data from benchmarking studies can be used to document facility plans.*

### Key Definitions

**Airport survey**: The collection of data for the analysis of some aspects of the airport or airport operations.

**Benchmark study**: The practice of comparing key metrics for the airport and airport operations to other similar or competitive airports.

### Airport Survey

Airport surveys and benchmarking studies are the primary source of airport operators' information on the characteristics and demands of airport users, their demographics and their present and anticipated usage dynamics. There are two general types of surveys: those that are specific to an airport and its operations (airport survey) and those that gather data on comparable or competing airports (benchmarking studies).

Surveys specific to your airport may include user, tenant and employee surveys and surveys of the community and local businesses. Such surveys are useful in the process of airport planning and forecasting and often are conducted as part of a planning process to identify facility requirements. Surveys can also be used to provide supporting data to justify the need for airport development. Because of a broad range of possible airport survey types, defining the full range of airport survey contents is beyond the scope of this document. However, all airport surveys should follow the same best practices and common processes for establishing the survey design, structure, sampling and data-collection techniques.

All survey characteristics and practices should be identified and detailed during the survey planning process. The planning process balances the resources available (time, funds available, etc.) with the survey's level of detail and desired response rate. The survey planning process should determine the following:

- Survey purpose
- Survey method (e.g., intercept surveys, mail or electronic surveys, self-completed surveys, etc.)
- Frequency and timing of survey administration
- Survey population
- Sampling strategy and plan
- Survey location and associated logistics (e.g., security clearance for survey staff, etc.)
- External survey stakeholders and groups that may benefit from survey results

*ACRP Report 26: Guidebook for Conducting Airport User Surveys* contains a broad range of information and solutions for airport survey planning, design and analysis.

## Benchmarking Studies

As opposed to airport surveys, benchmarking studies measure your airport's metrics against the same metrics at other similar or competitive airports. A state system plan can also be used to benchmark existing facilities against recommended facilities. Such studies are useful to identify your facility's strengths or shortcomings and potential needed changes.

One of the most common uses of benchmarking studies is to establish market competitive prices by comparing your airport and its services against competing airports for items such as hangar rental rates or fuel flowage fees. These benchmarking studies may also be useful to identify attractive features at your airport to help market it to potential users and establish market pricing for various revenue sources, such as hangar rentals and fuel flowage fees. Airports should examine the results of the studies to identify best practices that are in place at competing airports. The best practices portion of the study's findings can be implemented at your facility, with a follow-up benchmarking study carried out to determine the impact of those changes.

Typically, a benchmarking study seeks to provide objective data regarding the facility capacity and utilization, financial performance and user or tenant satisfaction. The study may examine a variety of metrics, such as the following:

- Total based aircraft
- Annual operations
- Total passengers, as applicable
- Cargo capacity and performance, as applicable
- Revenue received from aeronautical and nonaeronautical tenants
- Tenant retention
- Capital and operating expenses
- Number of employees and payroll
- Hangars available and rental rates
- Volume of fuel sold
- Fuel flowage fee
- Number of individuals on a hangar or T-hangar waiting list

Some of the data needed for a benchmarking study may be available on the competitive airport's website, which can be a good place to start your discovery process. Because some competing airports may not be willing to share data beyond that available on the web page, you may need to reference or contact additional data sources. State aeronautics agencies, state or local economic development organizations or the local FAA ADO may be able to address gaps in data. A comparable airport that is not in direct competition with your facility may be more willing to share metrics and could become part of the airport manager network. Sharing the study results could be an incentive to have another airport join the study process. Sometimes state or national associations have conducted studies that could provide baseline information. An internet search on your study topics could identify existing study data.

When conducting a benchmarking study, you must ensure an "apples-to-apples" comparison is being made. The hardest part of benchmarking may be fully understanding the underlying dynamics of each airport being reviewed and how that would affect their information.

## Peer Review

According to the results of the airport manager survey conducted for this guidebook update, nearly 39 percent of the respondents indicated their reliance (fully or in part) on the experience, mentorship and informational resources provided by other airport managers or peer organizations

at the state or regional level. Peer-to-peer experience sharing continues to be the most substantive means of real-world training and development for airport managers of various skill levels. This illustrates the significance a peer review has on the continuing growth and development of an airport. A peer review allows airport operators to seek guidance and advice from peers who have experienced similar circumstances or operate within similar constraints. This is typically accomplished with comparable, but not competitive, airports.

A peer review can provide a more formal approach to a collaborative project and program improvement and may comprise the following:

- Conference-style exchanges: A gathering of a large group of airport-manager peers for a 1- to 2-day event to discuss pressing issues in the industry.
- Focused reviews: A meeting of a smaller group of peers, hosted by an organization or agency, to provide input on the host's specific project, program or initiative. It may also be a smaller group of airports working cooperatively on similar issues, such as funding.
- Performance audits: A team of peers performs an on-site evaluation of the host agency's practices in a particular area, such as maintenance practices, airport rescue and firefighting or snow removal.
- Peer advisory teams: A small team of peer experts provides candid input on the host agency's project throughout the life of the project.
- Site visits: A small team from one agency visits another agency to see operations in practice, or a team of community stakeholders embarks on a tour of multiple airports to gather more extensive information.
- Focused technical assistance: One or more peers respond to an agency's request for technical assistance, training or operations assistance by email, phone or in person.
- Online forums: An individual requests informal feedback from a community of peers via an electronic mailing list, an online survey or a social media website.

As is the case with the airport surveys of any type, adequate planning and preparation to conduct the peer review can substantially improve the quality of the process and its results. *ACRP Synthesis 46: Conducting Airport Peer Reviews* focuses on combining the results of the study's literature review and airport manager interviews to form the following best practices for the airport's peer review process:

- Determine the goals for the peer review before doing anything else. What are you trying to learn? How will you use the information you receive? If you know your goals, then you can develop an agenda and participant list that will help you best meet those goals.
- Consider the purpose of your peer review when determining how influential it will be. If you want to incorporate a new direction or idea, the peer review must take place while there is still an opportunity to make changes based on the input received. If the goal is validation or documenting lessons learned for future projects, it may make sense to hold the event later in the process.
- Similarly, consider the peer review goals when selecting participants. If a decision or recommendation is desired, it may be challenging for a large group of people to reach a consensus. In addition, it is important to recognize the varying perspectives offered by potential attendees. It may be important to invite participants based solely on their experiences with similar projects, or it may be valuable to limit participation to representatives from airports that are similarly sized and structured.
- Effectively communicate the roles and responsibilities of all peer review participants. This includes individuals who are initiating and hosting the review, serving as peer experts or assisting with planning or facilitation.
- Help participants prepare for the exchange by sending background information, peer review objectives and questions in advance.

- Consider your available budget when selecting a peer review format, but don't let potential costs deter you. There is value to any amount of peer input.
- Consider using a designated facilitator to help the peer review run smoothly and ensure that all participants have an opportunity to share their experiences with the host agency. Select a facilitator who is skilled in leading group discussions that involve competing ideas; in addition, a facilitator with subject area expertise may be better able to keep the discussions on topic.
- Document the peer review discussions, findings and action items in order to support the host agency's next steps. Any reporting must be timely: completed at the event or immediately following the event.

While the summary of the aforementioned best practices can be used as a starting point to your peer review process, the synthesis contains substantial reference resources to help you extract the most benefits out of your future peer reviews.

## 5.14 IT Systems

### Key Insights

*Information technology infrastructure at airports is a complex aggregation of physical and software resources that ensure delivery and sharing of information among internal (airport staff) and external (passengers, fixed-base operators, flying public) stakeholders.*

*Because airports constitute an element of critical safety and security infrastructure, security of information technology resources is paramount.*

### Key definitions

**Baggage sort system**: Baggage tag readers and baggage conveyer switching or sorting equipment used to read baggage tags and divert bags to their intended destinations.

**Cyberattack**: A deliberate attempt to violate the security of a digital system. A successful attack is one that achieves its goal, typically causing harm to information, systems or infrastructure or disrupting operations that rely on these resources.

**Cybersecurity**: Means and methods that protect data and systems from unauthorized access, inappropriate modification or unintentional loss.

**Flight information display system (FIDS)**: A networked system at an airport used to display real-time flight arrival and departure information.

**Information technology (IT)**: Study or use of a system (especially computers and telecommunications) for storing, retrieving and sending information.

**Local area network**: A computer network covering a smaller physical space, such as an airport terminal, without the need for long-distance cabling.

### IT System Design and Implementation Best Practices

The delivery of IT resources remains a substantial challenge to managers of airports of all sizes, mainly because of the rapidly evolving nature of IT delivery systems' various facets and the highly technical nature of IT systems in general. According to the findings of the research that formed *ACRP Report 59: Information Technology Systems at Airports—A Primer*, communication issues related to a lack of common understanding of IT demands and common process and decision-making approaches to evaluate IT measures create fundamental challenges to effective IT implementation. For airport operators, managers and sponsors, who are accustomed to dealing with facility infrastructure elements with long service lives, IT systems—which have a substantially shorter lifespan—necessitate a different understanding and approach to evaluating need and implementing a solution.

IT systems consist of utility infrastructure (such as cable and fiber-optic transmission lines), networking infrastructure that includes wired and wireless networking hardware (modems, switches, servers, etc.) and the system applications layer. IT systems provide efficiencies and data solutions to all airport management functions, including planning, development, finance and operations. Therefore, planning for IT system design and maintenance should be part of the standard airport strategic planning process, rather than a reaction to a short-term immediate need. Because of the inherent complexity of IT system design and terminology, planning IT solutions must be a stakeholder-driven process, inclusive of the airport's decision makers as well

as the stakeholders set to benefit from the IT solution. For example, the development of the airport's GIS mapping solution should include the users' feedback and needs while balancing the realistic goals of decision makers, such as funding availability.

ACRP research projects have developed several useful resources on airport IT system design, alternative methods of IT delivery for small airports and airport cybersecurity. Several ACRP documents contain best practices that should be used to guide decisions about IT system structure, application solutions and planning investments in IT infrastructure.

- *ACRP Report 59: Information Technology Systems at Airports—A Primer*
- *ACRP Report 128: Alternative IT Delivery Methods and Best Practices for Small Airports*
- *ACRP Report 140: Guidebook on Best Practices for Airport Cybersecurity*

## Scalability of IT Systems

The intrinsic, scalable nature of IT solutions gives them the capability to handle increasingly higher or different workloads and be upgraded or enlarged to accommodate the workload. That scalability of IT systems translates well to the airport industry, based on the level of facility demands and operational complexity. It is one of the key considerations during the definition of the IT system's concept of operations, because it allows the airport decision makers or management to invest in IT infrastructure with the confidence that any future demands or obsolescence can be mitigated through upgrades.

According to *ACRP Report 128*, each IT solution's scalability can be evaluated considering these parameters:

- Not scalable: No improvement or upgrade is available or possible.
- Dynamically scale on demand: Features/capabilities are only added when needed.
- Upgrade: System or hardware needs to be upgraded to a recently released version.
- Replace: System or hardware needs to be replaced with a new or different system or hardware with more applicable or relevant features.

These parameters are applicable to solutions that cover the entire range of IT, from basic network development to complex application layers. For more detail on the scalability of IT systems to small airport environments, reference *ACRP Report 128*.

### BEST PRACTICES FOR IT PROJECT IMPLEMENTATION

**Definition of needs and requirements:** What shortfalls or needs is this IT solution intended to address? What will this solution improve?

**Definition of concept of operations and system or solution composition:** Who will use the system? How will it be secured, physically and in cyberspace? What physical and application components will it require for implementation?

**Analysis of system benefits and implementation and maintenance costs**: How do IT solution benefits, tangible and intangible, promote the organizational goals, plans or vision? How do the solution's benefits compare to the costs of system procurement, implementation and maintenance?

**Procurement and funding**: What is the cost of initial procurement and deployment? How will the purchase of system components be funded? How will the maintenance, user support and upgrades be funded?

**Solution deployment and administration**: Who will be responsible for the deployment and installation of physical components or applications? Who will be responsible for administering the system and its application and security features?

**User feedback and system maintenance**: How will the system performance and benefits be benchmarked and evaluated? Who will be responsible for user assistance, routine maintenance and the correction of system faults or breaches?

**Planning for upgrades or component replacement**: What is the system life cycle, and how frequently will the components need to be upgraded, patched or replaced?

## IT System Applications and Their Layers

System applications fall under the general categories of airport specialty systems, airport safety and security systems, facility management (building automation systems), and enterprise and office productivity solutions. Additionally, applications may be integrated with a larger-scale application solution of the airport sponsor (county or municipality), such as a GIS platform that is customized with airport-specific data and information.

In determining the most appropriate application solutions for a specific airport need, the following methods of application implementation may be utilized:

- Off-the-shelf procurement: Purchase of software that is ready-made and available for purchase by the general public.
- Application development: Development of applications, or parts thereof, that are custom-made for the airport (whether with internal resources such as the airport sponsor's IT staff, or external resources, such as a software development company).
- Subscription service: Purchase of a time-limited use of applications, software suites, or parts thereof, which are maintained up to date by the developer on an ongoing basis. Use of software may become limited, or software may become inaccessible in the event of subscription expiration.
- Collaborative application sharing: Use of software, or parts thereof, that is in use by the airport's sponsor or affiliated organization, such as GIS layers or applications, HR software, accounting software and resources.
- Open-source acquisition: Acquisition of software distributed without a fee or obtainable at cost.

In evaluating the fit of the various methods of software implementation, airport managers should assess all benefits and risks associated with the various approaches. Appendix C in *ACRP Report 128* contains a detailed description and discussion of the various methods of application implementation and the risks and benefits of each solution.

## Outside Expertise

Because IT systems are a rapidly changing field, it may be beneficial for the airport operator to contract for outside expertise through the use of consultants. When obtaining outside services, you should follow the appropriate procurement process based on the funding source and associated regulations. You may also be able to use expertise within the airport sponsor's governing organization (city, county, etc.) for assistance.

## 5.15 ATCT Establishment

### Key Insights

*Operations at many nontowered airports can range from large corporate jets to small, single-engine aircraft, helicopters and flight training. At busy small airports, an airport traffic control tower can help separate these operations and provide an added layer of safety beyond the "see and be seen" and position reporting in effect at nontowered airports.*

*Many of the control towers at small airports are part of the FAA's contract tower program.*

*Services available to pilots at airports with contract towers may vary from that of full-service, FAA-staffed control towers. Some contract towers may have basic instrumentation, such as a radar feed, but many are operated on visual flight rules.*

*Occasionally, a temporary tower may be established at a small airport to support a special event, such as the Super Bowl.*

*Operators of smaller aircraft may prefer to operate at nontowered airports, while some corporate operators prefer or may be required by internal policy or insurance to use a controlled airport.*

### Key Definitions

**Airport traffic control tower (ATCT)**: A raised facility on the airfield from which controllers visually, and by radar where available, monitor air traffic and use two-way radios on a designated frequency to direct traffic.

**Benefit–cost ratio**: A calculation, determined by the FAA, of the cost of the service provided compared to the benefit of that service.

**Contract tower**: An airport traffic control tower facility for which the FAA will pay the cost (some or all) of nonfederal employees and, in some instances, provide some of the operating equipment installed in the tower.

**Instrument flight rules (IFR)**: A set of regulations and procedures permitting qualified and current IFR pilots to penetrate clouds and low-visibility conditions. Aircraft must be equipped with radio and navigation instruments and operate under air traffic control flight plans and clearances. Flights are monitored and traffic is separated by air traffic control.

**Visual flight rules (VFR)**: A defined set of FAA regulations covering the operation of aircraft primarily by visual reference to the horizon (for aircraft control) and see-and-avoid procedures (for traffic separation). VFR weather minimums for controlled airspace require at least a 1,000-foot ceiling and 3 miles of visibility, except for "special VFR" clearances to operate "clear of clouds."

### Need for an Airport Traffic Control Tower

As traffic increases at a small airport, an airport manager may be asked how the airport can obtain an ATCT. The installation of an ATCT, or the cost-sharing of one through the FAA contract tower (FCT) program, is determined through a benefit–cost analysis. This analysis is used to document the justification for the establishment of an ATCT. The volume of operations is the primary factor, although the mix of traffic and location relative to busy commercial passenger hub airports are site-specific factors that can be evaluated when considering the establishment of an ATCT.

### ESTABLISHMENT CRITERIA FOR FAA ATCT

According to FAR Part 170.13, the following criteria, along with general facility establishment standards, must be met before an airport can qualify for a control tower:

1. The airport, whether publicly or privately owned, must be open to and available for use by the public as defined in the Airport and Airway Improvement Act of 1982;
2. The airport must be part of the National Plan of Integrated Airport Systems;
3. The airport owners or authorities must have entered into appropriate assurances and covenants to guarantee that the airport will continue in operation for a period that is long enough to permit the amortization of the control tower investment;
4. The FAA must be furnished with appropriate land without cost for construction of the control tower; and
5. The airport must meet the benefit–cost ratio criteria specified herein,utilizing three consecutive FAA annual counts and projections of future traffic during the expected life of the tower facility. (An FAA annual count is a fiscal-year or a calendar-year activity summary. Where actual traffic counts are unavailable or not recorded, adequately documented FAA estimates of the scheduled and nonscheduled activity may be used.)

The AAAE U.S. Contract Tower Association can provide invaluable assistance during these processes. FAA Order JO 7210.78: FAA Contract Tower (FCT) New Start and Replacement Tower provides additional guidance on the FCT establishment process.

#### *Aircraft Operations Data*

Traffic counts are a key element needed to justify the establishment of an ATCT. The amount of air traffic at an airport will determine if an airport is eligible to obtain federal assistance for staffing the tower. Accurate counts are essential. The traffic counts should be taken in half-hour intervals for the period the tower is anticipated to be operational.

Traffic counts can be obtained in a variety of ways, including using airport staff or hiring an individual to collect the data. Acoustic devices, cameras or highway traffic counters can be used to count traffic. When selecting a counting method, accuracy and reliability must be considered. Using an individual with aircraft knowledge or video recordings will give the highest level of accuracy. Acoustic devices and highway traffic counters will probably not give the data required, and highway traffic counters can be very unreliable, because they require the aircraft to roll across the counter. *ACRP Report 129: Evaluating Methods for Counting Aircraft Operations at Nontowered Airports* provides additional information on the advantages and disadvantages of the various traffic counting methods.

#### *Aircraft Mix*

While not considered in the benefit–cost analysis, the mix of aircraft can offset a deficiency in the total traffic count for site-specific considerations. For example, a high level of corporate jet traffic mixing with numerous propeller aircraft, such as a flight school, can be used to help justify the need for an ATCT. When obtaining the traffic counts, the type of aircraft should be noted in the documentation. Aircraft type does not need to be specific to the model but should include engine information such as single-engine piston, single-engine turbine, twin-engine piston, twin-engine turbine and jet.

#### *Accident/Incident/Incursion Records*

Past accidents or incidents at an airport may also help demonstrate the need for an ATCT. These records may provide additional justification by documenting the need for an increased level of safety. Items that should be addressed in these records are factors such as topography, weather, runway configuration and mix of aircraft that could be addressed with an ATCT.

## Benefit–Cost Ratio

The data on airport operations, as described in the previous section, is used to calculate the benefit–cost ratio for an ATCT. The value of the benefits of a VFR tower and costs of a VFR tower over a 15-year time frame are compared. A location is eligible for a control tower when the benefits exceed the costs by a ratio of 1.0 or greater. An airport with a ratio lower than 1.0 may be eligible for the federal contract tower cost-sharing program on a prorated basis. Site-specific activity forecasts are used to estimate benefits from prevented collisions between aircraft, prevented accidents and reduced flying time. Costs are estimated for annual operating costs, including staffing, maintenance, equipment, supplies and leased services as well as the investment for

facilities, equipment and operational startup for new towers. When pursuing a viable request for an ATCT, you must have state and local political support.

## Funding the Facility

Being eligible for a tower is just the first step. The next step is funding the facility. Construction and maintenance of the tower, as well as the provision of all the equipment required to operate the facility (radios, weather equipment, radar, etc.), will be at the sponsor's responsibility to procure. An airport sponsor can apply for grants for building and equipping the facility. Grants are the most cost-efficient method of financing the ATCT facility and equipment; however, the sponsor may consider loans or budget allocations. A sponsor can also pursue support from local users, particularly if there is a local (usually business) user that desires the establishment of the ATCT.

In most cases, when the justification has been established, the FAA will only pay for the personnel for the tower. Funding the personnel costs could be at 100 percent or on a cost-share basis for facilities with a benefit–cost ratio below the required level. At a cost-share tower, the airport sponsor must fund the remaining balance through local resources. At some small airports, active corporate users that benefit from the ATCT have been willing to contribute toward its operation.

## Selecting a Controller Provider for ATCTs in the Contract Tower Program

When airports have been selected for inclusion into the contract tower program, the FAA will select and contract with the service provider. The FAA issues requests for proposals on a periodic basis for the provision of these ATC services. These selections are usually made on a regional basis.

For a control tower being established without federal funding, controllers may be hired by the sponsor individually or through a contract with a provider. Controllers must be FAA licensed, pass physical requirements and be certified in the facility.

## Expanding Tower Operation Times

As air traffic expands at the airport, it may be desirable to expand the operational hours of the ATCT to provide an added level of safety. In these cases, it is advantageous to hire the existing tower personnel to conduct the traffic counts for the desired extended hours. Although the ATCT personnel cannot control aircraft movements during these times, they have a high degree of knowledge and access to information, such as monitoring the common air traffic control frequency and observing radar information, if the tower is so equipped.

The data collected for the purpose of expanding tower hours should include the aircraft type and tail number (N number on U.S. registered aircraft), whether the flight is IFR or VFR and the date and time of the operation. The data collection should be conducted over 3 consecutive months. Once the data has been accumulated, the next step would be to petition the FAA for increased operational hours.

CHAPTER 6

# Communication—Promoting the Airport and Connecting with the Community

Icons are defined in Figure 1 in Section 1.1.

Communication is integral to the success of the airport as an organization. Airport managers must communicate with governmental entities, customers, tenants, regulatory agents, commissions, boards, media and the general public. A positive perception of the airport in the community is extremely valuable. Airports must do this through educating the public on the value of the airport to the community. This section provides more detailed information on how a small airport manager can understand and improve community relations, cultivate the airport's brand, develop marketing plans, utilize communication tools, understand and communicate the airport's economic impact and communicate during emergency situations.

## 6.1 Community Relations

### Key Insights

*Public relations is vital to the success of any small airport. An airport manager should implement a variety of public relations strategies aimed at maintaining a positive perception of the facility and building community relations.*

*Maintaining a presence in the community is a key aspect of the airport manager's job.*

*It is essential for the airport to be proactive and transparent in all its transactions and communications.*

*An airport can communicate its successes even without the need to carry a marketing budget.*

*A marketing plan can help guide a positive local image and promote effective communications in the community and with all airport stakeholders.*

### Key Definitions

**Crisis communication**: The ability to protect the reputation of the airport through a plan that provides timely and accurate information to passengers, stakeholders, the community and the media.

**Press kit**: Contains information and photographs about the airport and is used to submit publicity materials to the media for consideration.

**Stakeholder**: A person, group or organization that has interests or concerns in the airport and can affect or be affected by the airport's actions, objectives and policies; examples are employees, tenants, first responders and airport traffic control tower personnel.

## Overview

Many people and communities are unaware of the numerous benefits an airport brings to a region. Small airport managers must work closely and have an active partnership with their communities. It is part of many small airport managers' jobs to educate a wide variety of stakeholders and local public officials on the value of the airport, and this should be done daily. Communication is the building block for working with and educating the community. A positive relationship with stakeholder groups is crucial to the viability of your airport and its link to the air transportation system. The more you communicate its benefits and organizational progress toward goals, the more people will understand what an essential asset the airport is to the community. Forging relationships with officials, business leaders and news media can help your airport if and when a controversy arises.

## Stakeholder Engagement and Relationships

Airports have many stakeholders who have daily impacts on the airport or who are affected by decisions made by airport operators, such as the following:

- Airport users/customers
- Airport tenants
- Airport board and advisory committee
- Airport neighbors and general public
- Economic stakeholders
- Elected officials and policymakers
- Service providers

Each stakeholder is important and needs individual interactions with and messages from the airport. Airports must understand each stakeholder group and form partnerships with each group.

Issues that may require building stakeholder relationships include customer service, airport development, airport operations, construction projects affecting stakeholders, airport master planning or strategic business planning, economic development goals, environmental impacts and changes to airport leases or standards. Each of these issues may require different approaches with various stakeholder groups.

### KEY INTERPERSONAL SKILLS

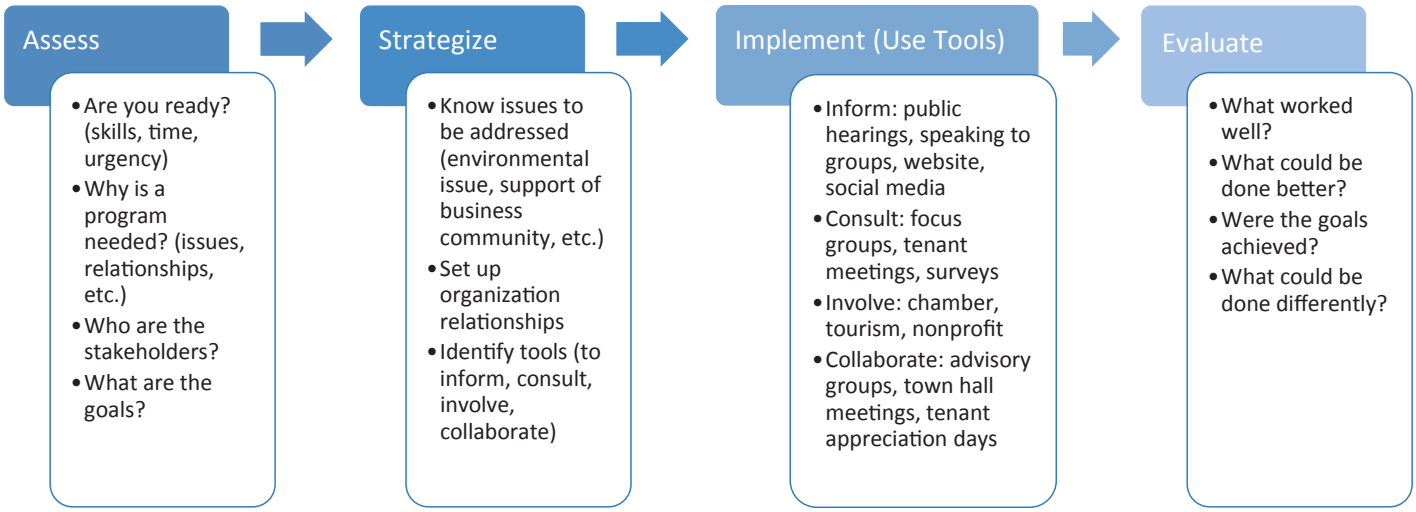
- **Listen/be empathetic**—Learn from stakeholders and understand where they are coming from.
- **Be consistent**—Stick to key messages and be visible in the community.
- **Be patient and persistent**—Follow up frequently with stakeholder groups and tell your story often.
- **Develop strong public speaking skills**—Talk directly to people and make a connection. Be prepared, understand your content and practice your message. Develop these skills by doing them often.

Several key interpersonal skills will help build more successful relationships with stakeholders. Using these skills can be just as important as technical knowledge when working with airport stakeholders.

## Stakeholder Engagement Attributes

*ACRP Synthesis 65: Practices to Develop Effective Stakeholder Relationships at Smaller Airports* describes effective practices, tools, communication techniques, feedback loops and case examples that highlight how leaders at smaller airports proactively manage stakeholder relationships. *ACRP Synthesis 65*, Chapter 4: Case Examples, details what has been successful for other airports and provides insights on what may be effective in your community when working with various stakeholders.

The key to good relationships with stakeholders is proactive development of the relationships based on open communication, trust and transparency. If a relationship is poor, the first step to improve that relationship is to build trust. By demonstrating a willingness to address the immediate concerns of the stakeholders, you are more likely to build a relationship of trust that




Source: Adapted from *ACRP Synthesis 65: Practices to Develop Effective Stakeholder Relationships at Smaller Airports*, Appendix C, 2015

***Figure 15. Stakeholder engagement process.***

will make it easier to work with this group and others in the future. Sustained and consistent efforts will also ensure the successful relationships continue.

Appendix C of *ACRP Synthesis 65* provides a checklist that highlights practices for you to use when assessing your readiness to undertake a stakeholder engagement process or program; strategizing, formulating and implementing such a process or program; and evaluating outcomes. This checklist was derived based on the models discussed in a literature review, practices discovered through the survey process and case examples that highlight successful stakeholder engagement efforts. Figure 15 shows the four main steps in the process for effective stakeholder engagement. This is a continuous process that does not stop after the first evaluation is complete.

## Resources/Tools

In addition to *ACRP Synthesis 65*, several other resources discuss techniques and practices for stakeholder engagement and community relations when dealing with specific issues:

- **Airport development—capacity**: *ACRP Report 85: Developing and Maintaining Support for Your Airport Capacity Project*, Chapter 4: Building and Maintaining Support with Stakeholders, provides strategies for working with various stakeholders, including supporters, opponents and bystanders.
- **Environmental concerns—aircraft noise**: *ACRP Report 15: Aircraft Noise: A Toolkit for Managing Community Expectations* provides guidance on how to improve communications with the public about issues related to aircraft noise exposure. An accompanying CD-based toolkit contains over 200 examples of noise and public participation documents.
- **Airport preservation**: *ACRP Report 44: A Guidebook for the Preservation of Public-Use Airports*, Chapter 4: Practical Management of 16 Primary Airport Closure Risk Factors, includes suggested roles to be employed by individuals and entities for stakeholder engagement and possible leadership and advocacy opportunities in the community.
- **Airport protection**: The AOPA website has several tools available to assist in advocating for your airport through actions such as community relations and establishing an airport support group.

- **Airport planning**: *ACRP Report 20: Strategic Planning in the Airport Industry* identifies which stakeholders should be considered in the strategic planning process and what level of involvement and type of participation each stakeholder group should have in the process.
- **Airport leasing policies**: *ACRP Report 47: Guidebook for Developing and Leasing Airport Property* discusses the importance of stakeholder engagement when developing airport leases and other policies.
- **Engaging elected officials**: National Business Aviation Association's Member Guide for Building a Relationship with Your Elected Officials is a guide that provides information on how to make a visit with elected officials a success, including a meeting checklist.
- **Airport advocacy**: National Business Aviation Association's Airport Advocate Guide provides the basic information you should be familiar with when advocating for your airport, such as how to quantify airport value and how to build relationships, and includes checklists for community-wide outreach and local area outreach. Guidance on how to develop media relations and several airport case studies are included.
- **Community involvement**: The FAA has a Community Involvement Manual that describes practices and effective techniques for community involvement.
- **General aviation**:
  - AOPA has a presentation, General Aviation: Connecting our Community to the World, available for small airports to use as an educational tool.
  - The October/November 2016 *Airport Magazine* article "In Support of General Aviation, Many Ways to Advocate for This Industry" by Tim O'Krongley describes how the San Antonio Airport System promotes Stinson Airport, the second-oldest continuously operating GA airport in the country
- **Construction project**: The 2016 *Airport Improvement* article "Redmond Municipal Uses Communication, Planning to Mitigate Regional Impact of 3-Week Closure" by Ken Wysocky describes how the comprehensive communication program was a critical component of the successful runway reconstruction project.

These resources also provide additional general insights on community and stakeholder relationships and approaches that could be adopted to any size airport or type of airport project.

## 6.2 Branding

### Key Insights

*A brand encompasses (1) airport values and attitudes about customer service, (2) benefits and features of your airport and (3) qualities that are associated specifically with your airport.*

*A brand is more than a logo, palette of colors and a tagline. It defines what your airport is and aspires to be.*

### Key Definitions

**Brand**: An airport's identity that differentiates it from its competition.

**Branding**: The process of creating a unique, positive and recognizable identity for an airport that attracts and retains customers.

### Do You Need a Brand?

In the last few decades, more airports are making strategic decisions to be financially self-sufficient and to operate more like a business. This includes making the most of the airport's brand. A brand can be defined as the perception clients have of a business. There are tangible elements—such as a logo, slogans, imagery and messaging—and intangible elements—such as the client experience and expectations—to a brand. At its core, a brand is created by a continuity of client experiences. Finding out what clients think of your facility will guide you in the way you interact with them to enhance or change their perceptions.

*ACRP Report 28: Marketing Guidebook for Small Airports* notes that an airport brand encompasses airport values and attitude about customer service, benefits and features of your airport and qualities that are associated with your airport. Your brand must be consistent with your marketing messages.

Social media has made branding and building a brand more important than ever. Increasingly people are using social media multiple times a day, which makes it a great way to build your brand. Consider which platforms (for example, Facebook, Instagram, Twitter, Google+ and LinkedIn) support your brand and then choose content images that support your brand.

When branding or rebranding, remember to keep in mind that your airport most likely has an interesting history. This history should be celebrated, and brought forward in your branding program, even if you are contemplating a very modern look and feel to your brand.

### Assistance in Developing a Brand

It can be difficult to understand how your airport is perceived from the outside. Often, paid marketing or public relations experts can develop a strong brand and a marketing program. They can also assist with conveying the brand's message to the right target audience in a meaningful way. Means to convey your message can include brochures, advertising, billboards, your airport's website and social media. If your airport does not have the funds available to pay a consultant to assist with brand development, consider volunteers or firms that may be willing to trade for in-kind advertising at the airport. The local college marketing or business program may also be willing to assist with brand development efforts.

## 6.3 Marketing Plans

### Key Insights

*A marketing plan is a key component of an airport business plan.*

*Marketing plans help an airport communicate with customers (community, airport sponsor, key stakeholders, airlines, etc.).*

*The marketing plan should be focused on driving business development in virtually every commercial aspect of your airport.*

*If you have a private fixed-base operator at your airport, it is a best practice to incorporate its plans and cover its needs in an airport-wide marketing plan.*

*Marketing plans can be developed by airport staff, a local university, an economic development organization or a consultant.*

*Airport goals and objectives should be well defined before a marketing plan can be effectively developed and executed.*

### Key Definitions

**Action plan**: Describes the actions intended to achieve the stated goals and objectives.

**Marketing plan**: A comprehensive document that describes an airport's marketing activities in the upcoming fiscal year and beyond.

**Strengths, weaknesses, opportunities and threats (SWOT) analysis**: An exercise that identifies an airport's strengths, weaknesses, opportunities and threats.

### Purpose of an Airport Marketing Plan

An airport marketing plan is the formal document that provides the framework and direction for an airport's marketing activities. It is often a component of an airport business plan or strategic plan. It facilitates the gathering of relevant information to meet an airport's goals and business objectives. It serves as the road map that converts marketing goals into specific activities.

Every airport's marketing plan should be unique and customized for each airport's set of opportunities and challenges. *ACRP Report 28: Marketing Guidebook for Small Airports* is an excellent resource for airports on how to develop an airport-specific marketing plan. A marketing plan should be updated regularly to reflect achievements and changes to the action plan. As noted in *ACRP Report 28*, an effective airport marketing plan is customer and service centered, differentiates itself from competitors, is easily communicated, is motivating and is flexible.

### Core Components of an Airport Marketing Plan

*ACRP Report 28* outlines the following four main components of an airport marketing plan:

1. **Airport's current position**: This section will contain an overview of the services offered at the airport, major users and tenants, activity at the airports, competitive position in the region and a discussion on the trends that have the potential to affect the airport.
2. **Airport's goals and objectives**: This component includes a discussion of the airport's goals, target audience, message to be communicated and measurable objectives to achieve during the time frame.

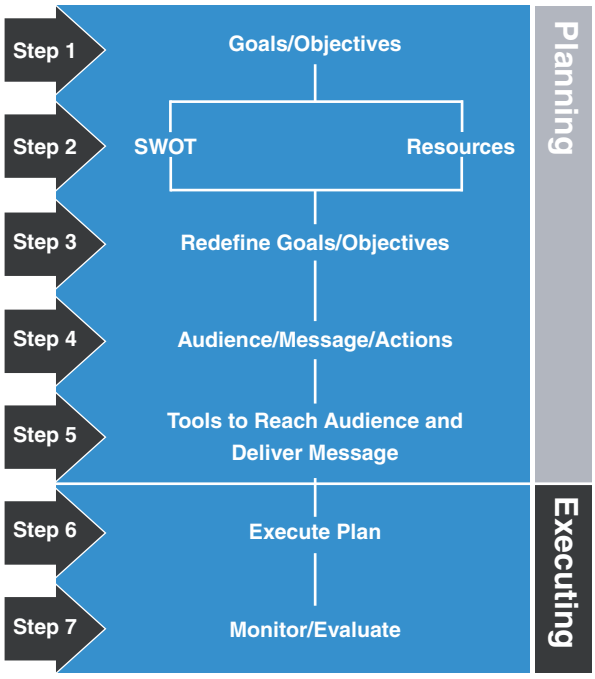
3. **Action plan**: The action plan includes a detailed description of the marketing activities that will be undertaken to achieve each objective. It should include a task description, assignments of people, schedules and budgets.
4. **Management and monitoring**: This section of the plan includes information on how to monitor the marketing campaign and progress against goals and update the marketing plan as needed.

## Seven Steps to Creating an Effective Marketing Plan

Before an airport creates a marketing plan, a self-assessment is necessary. This can occur in the strategic or business planning process. Part 2 of *ACRP Report 28* details the seven steps to prepare and implement a marketing plan, which are summarized in Figure 16. It also provides examples of goals, objectives and actions for an airport to consider when developing marketing plans for GA airports and small commercial service airports as well as case studies that highlight successful airport marketing plans.

## Assistance in Developing a Marketing Plan

The use of a marketing or public relations firm can help an airport develop a marketing plan from an objective viewpoint and help deflect possible political influence. A marketing consultant can also efficiently generate market research and identify the most effective marketing tools to utilize. They can also assist with advertising materials, website development, social media and advertising placement. Other qualified resources that could be considered in the development of marketing plans include local colleges and universities, economic development groups, chambers of commerce, city staff and volunteers.




Source: *ACRP Report 28*, used with permission from GMH Consulting, LLC

***Figure 16. Seven steps to creating a marketing plan.***

## Resources/Tools

Several other resources can be used to assist in the development of your airport marketing plan:

- *ACRP Report 28*, Chapter 13: Marketing Plan Worksheets, provides worksheets, prompts and examples for completing an airport marketing pan. Worksheets include a SWOT primer, SWOT examples, SWOT analysis worksheet, marketing inventory worksheet—human resources, marketing inventory worksheet—financial resources, marketing action plan and marketing record.
- *ACRP Report 28*, Chapter 14: Case Studies, provides detailed case studies of three airports that have implemented successful marketing plans.
- The AAAE's "A Focused Marketing Plan for General Aviation Airports" is a white paper that contains useful information on marketing for airports, including how to conduct an inventory of your airport and how to develop marketing plans. It also discusses a variety of possible marketing tools that could be considered.

## 6.4 Communication Tools

### Key Insights

*The most effective communication tools will vary by airport and depend on the airport's goals, message and audience.*

*Social media has become a key communication tool for airports over the last several years.*

### Key Definitions

**Earned media**: Publicity gained through promotional efforts other than paid media.

**Media relations plan**: A document that provides the process of how to interact with the media with clarity and purpose.

**Owned media**: Content the airport is in control of—its website, social media, etc.

**Paid media**: Advertising purchased through publications, radio or television stations, websites and social media.

**Press kit**: A document that contains information and photographs about the airport and is used to submit publicity materials to the media for consideration.

**Social media management**: The utilization of tools to grow social media presence, monitor accounts and keep track of online activities of various social platforms.

### Types of Communication Tools

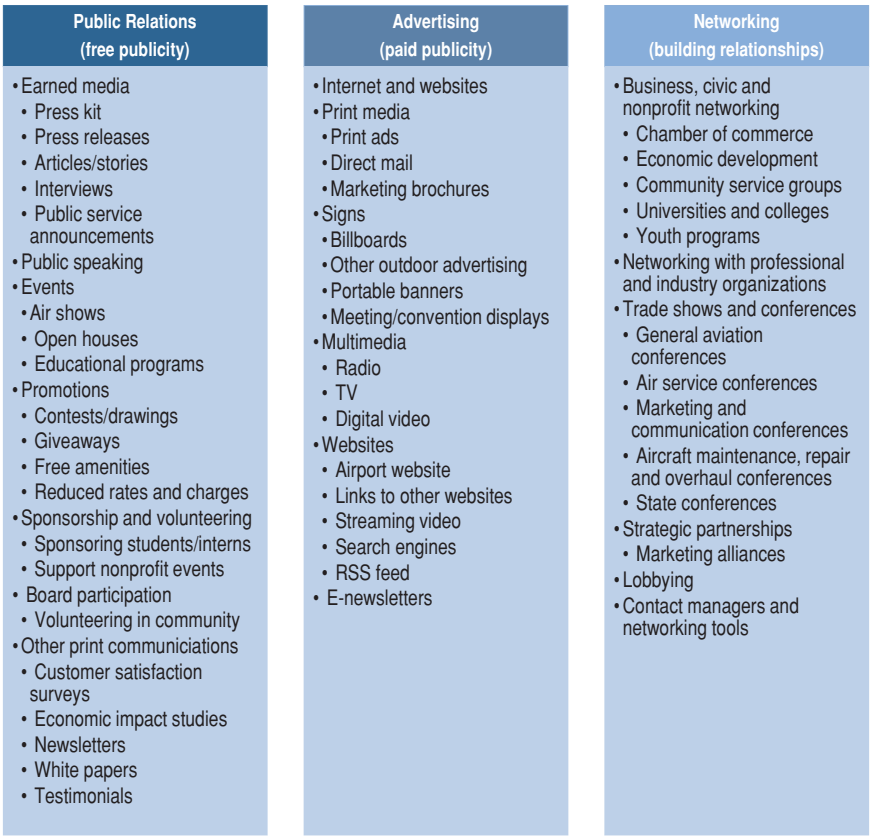
Airports must rely on various communication tools to engage stakeholders, promote the airport, network, advertise, inform the media and relay important information. Step 5 of the seven steps to creating a marketing plan is "Tools to Reach Audience and Deliver Message." *ACRP Report 28: Marketing Guidebook for Small Airports* provides a description of the various marketing tools and advertising techniques for consideration. Which tool is chosen will depend on the message, the audience you are trying to reach, budget and other factors. This report also notes examples and best practices for using traditional means, websites and social media for airport communication and marketing.

*ACRP Report 28* divides marketing tools into three categories: public relations, advertising and networking. Figure 17 shows the various communication and marketing tools that can be considered. For detailed descriptions, information on the relative costs and examples, see *ACRP Report 28*, Chapters 9 through 12. The report also highlights the five essential communication tools for airports:

- Press kits
- Websites
- Earned media
- Networking
- Public speaking

### Social Media

Social media provide a way to reach the local community and highlight the role of the airport as a transportation gateway and an economic benefits generator. *ACRP Synthesis 56:*




Source: Adapted from *ACRP Report 28:Marketing Guidebook for Small Airports*, 2010

***Figure 17. Types of communication tools.***

*Understanding the Value of Social Media at Airports for Customer Engagement* provides information about using social media platforms to enhance customer engagement. Although the synthesis discusses many initiatives that larger commercial service airports are undertaking, much of the information is relevant to smaller airports as well.

Chapter 2 of *ACRP Synthesis 56* describes the social media platforms and management tools that can be considered for airport communication and marketing. The platforms include Twitter, Facebook, YouTube, Instagram, Snapchat, LinkedIn and others. Social media management tools allow you to evaluate social media data, monitor conversations and schedule posts. In terms of content, postings about airport events, pictures, videos and partnerships with the local community or airport businesses are a few of the typical community engagement strategies. This synthesis also provides many example posts that airports have used to communicate with the public, and Appendix C provides example social media guidelines and policies for consideration.

Social media can also be used to help effectively manage crisis events. For more information on crisis communication, refer to Section 6.6: Emergency Communication.

## Media Relations Plan

Creating a relationship with local and regional media (newspaper, TV, radio) can be done intentionally and strategically. A proactive relationship with the media can be formalized through a media relations plan. Figure 18 shows the components of an airport media relations


Source: Adapted from Developing an Airport Media Relations Plan, *ACRP WebResource 1: Aligning Community Expectations with Airport Roles*

***Figure 18. Components of an airport media relations plan.***

plan. It is an advantage for an airport operator to establish a relationship with the local media, in addition to providing news to the media outlets.

There are several useful tools and resources to help develop an airport media relations plan:

- *ACRP WebResource 1: Aligning Community Expectations with Airport Roles* provides the following:
  - A worksheet tool (Developing a Media Relations Plan) that airports can use when developing a media relations plan.
  - A press kit checklist.
  - A media contact worksheet that can help catalog contacts for print, television and radio.
- The AOPA media relations web page has a link to AOPA's media relations team that provides advocacy services and can connect reporters with in-house experts on a variety of aviation topics.
- The AOPA Resources for You web page provides a toolbox of media resources.

## 6.5 Economic Impact

### Key Insights

*The economic contribution of an airport is typically measured in terms of jobs, payroll and output.*

*There are a variety of acceptable models and methodologies that can be used to calculate economic benefit, and no standard way to compute it. The most widely used model is the input-output method, which measures direct, indirect and multiplier impacts.*

*Many state departments of aviation develop airport economic impact studies for their airports. A consulting firm or local academic institution may also be of assistance in the development of an airport's economic impact.*

*In addition to economic value, airports create qualitative value to a community, including assisting emergency medical response and supporting agriculture, disaster response and recovery, police and fire access, tourism and entertainment opportunities, military, search and rescue and traffic reporting, among many other items.*

### Key Definitions

**Airport economic impact**: The contribution of the airport to the regional economy, quantified in terms of employment, payroll and output.

**Direct economic impacts**: Jobs, payroll and output associated with

- The businesses at an airport that are typically related to the provision of aviation services,
- The economic benefits from spending in the local area by visitors that arrive by air, and
- The economic benefits of aviation-reliant businesses.

**Induced, indirect and multiplier economic impacts**: The benefits resulting from the recirculation of direct impacts within the economy.

### Understanding the Economic Impact of Your Airport

Your airport is an economic engine and an important asset to your community. The livelihood and community support of your airport depend on the support of the public, business leaders and elected officials. Having a community that understands and appreciates the value of your airport is imperative. One way an airport can determine its value is by quantifying its economic impact. An airport's economic impact is its contribution to the regional economy in terms of jobs, payroll and output.

*ACRP WebResource 1: Aligning Community Expectations with Airport Roles* includes an economic section in the Aviation Toolkit. This section provides information that enables you to understand the role of your airport within the economy and provides examples, tools and resources that can be used to determine the value of your airport. According to the study, airports contribute to local economies in three primary ways:

1. On-airport economic activity and employment
2. Airport-adjacent economic development
3. Off-airport activity at businesses that rely on aviation for business travel, cargo transport and access to visitors

## Calculating Economic Impact

Many states have developed economic impact studies for all airports in their state airport system. The National Association of State Aviation Officials provides a library of completed state aviation economic impact studies. Airport economic impact can also be calculated by an individual airport or community. There are several different ways to calculate economic impact, and different terminology such as the following is often used:

- **Direct impacts**: Include jobs, payroll and operating revenues associated with the following:
  - On-airport benefits from on-airport activity, including airport operations and administration, airlines and airline support services, concessions, ground transportation, FBOs, maintenance shops, etc.
  - CIPs on airport property, such as runway or terminal improvements that employ people in jobs in fields such as construction and engineering.
  - Benefits associated with airport-reliant businesses. See My Airport's Business Constituency worksheet in *ACRP WebResource 1*.
  - Benefits associated with commercial service and/or GA visitor spending. See Visitor Spending worksheet in *ACRP WebResource 1*. This category is sometimes called "indirect impacts."
- **Multiplier impacts**: Estimated based on direct impacts using regional input-output models that use region-specific economic data to trace interindustry relationships
  - Models include RIMS, IMPLAN and REMI.
  - Often called "induced" and/or "indirect impacts."
- **Total impacts**: Direct impacts plus multiplier impacts for jobs, payroll and output

*ACRP Synthesis 7: Airport Economic Impact Methods and Models* provides insights into the various methodologies of calculating economic impact. One widely used approach calculates direct impacts and multiplier impacts, as shown in Figure 19. Savings in time and transportation costs by using a more local airport can also be calculated and included.

## Using Economic Impact as a Public Relations Tool

Armed with your airport's economic impact, you can help the public better understand the value of your airport, especially if your airport does not have commercial service. Effectively communicating an airport's economic role can be a powerful way of transforming discussions to focus on the "upsides" of aviation and the ways in which airport development can be coordinated with other economic development efforts. *ACRP Report 132: The Role of U.S. Airports in the National Economy* can be used as a reference to incorporate the national impact of airports into your airport's outreach message.

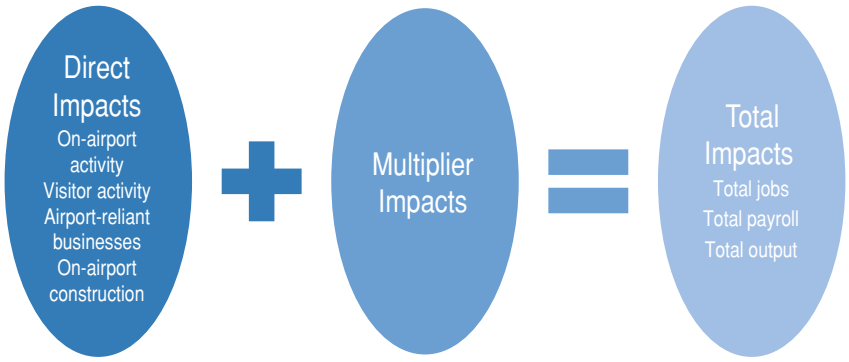



***Figure 19. How to calculate economic impact.***

## Knowing Your Users

Airports benefit from managers and staff working with their tenants and users to understand, describe and communicate the value of an airport and its contribution to the surrounding economy. Outreach to an airport's core constituency can help build a narrative around the economic role of the airport while establishing a channel for two-way communications, enabling users to offer their perspectives. This outreach can include conducting interviews with known airport users and major regional employers to further illustrate your economic story. Conducting forums for tenants or members of the business community to discuss the benefits of the airport to the community and meetings for GA users are other low-cost outreach efforts to demonstrate the value of the airport to the community.

## Being an Economic Development Partner

For airport-reliant industries (those that rely on aviation for goods transportation, business travel and delivery of services, and that bring in tourists), airports can play a critical role in business attraction and retention. Speak to people from the economic development and business community to ensure that the economic impact message is part of their discussions regarding future business location decisions. *ACRP WebResource 1* has a self-assessment guide to identify airport-reliant businesses.

Collaborate with community stakeholders to ensure everyone knows and is speaking to the economic benefit of the airport. This will help to highlight your airport as an asset within destination marketing and event recruitment efforts. (See ACRP's tool, Outreach and Recruitment: Your Airport as an Asset.)

## 6.6 Emergency Communication

### Key Insights

*The airport should have a designated spokesperson who is trained and prepared to serve in this role.*

*Communicate accurate information as soon as possible.*

*Form partnerships and networks with a wide range of agencies and organizations that are responsible for first response and recovery.*

*Practice emergency events to fine-tune the communication process.*

*Communication should be controlled by the airport, and certain data should be secure (personal data, need-to-know security information and operational information).*

### Key Definitions

**Crisis communication plan**: A document that helps determine how an airport will communicate to the news media, passengers, families, airport personnel and stakeholders.

**Crisis management team**: A group of people trained to respond immediately to warning signals of crisis and execute relevant plans to overcome emergency situations. The team protects the airport against the adverse effects of crisis and prepares the airport for inevitable threats.

### Overview

Emergency communication, including crisis communication, is important for any airport. For a small airport, developing a manageable emergency communication plan that fits the airport facility is part of disaster planning and working with the community for the good of all who live there. *ACRP Synthesis 73: Emergency Communications Planning for Airports* offers information on emergency communication planning for airports of all sizes. *ACRP Synthesis 82: Uses of Social Media to Inform Operational Response and Recovery During an Airport Emergency* addresses how airports use social media to glean information to use in their responses. *ACRP Report 170: Guidebook for Preparing Public Notification Programs at Airports* identifies practices to implement emergency and routine public notifications.

The objective of crisis communications is to mitigate potential reputational damage by providing credible, accurate information about an unfolding crisis as rapidly as possible and to demonstrate that the organization is responding in a professional, planned and appropriate manner. A key challenge is to maintain confidence in your airport management. A few of the key items to always acknowledge during a crisis include knowing your audience, sending appropriate messages, maintaining a timely response, accepting responsibility, maintaining credibility, expressing regret and coordinating with others. An airport can also consider transitioning from stand-alone communication technologies and systems into a single, unified system, which allows operators to control inputs and outputs and extend their responses beyond the airport property.

The 2013 Sara M. Antol and Robert E. Butter presentation "Crisis Communications: Preparation and Response" (hosted by the Association of Corporate Counsel) identified six steps of crisis planning: (1) identify the issues, (2) develop a team, (3) develop policies and statements, (4) prepare responses, (5) train and practice and (6) update and review.

## Crisis Communication Plan

A crisis communication plan helps determine how an airport will communicate to news media, passengers, families, airport personnel and stakeholders to mitigate potential reputational damage. A communication plan should include on-airport groups (e.g., tenants, passengers, employees, vendors), off-airport groups (e.g., federal and state government authorities), emergency services (e.g., police, fire, ambulance) and geographic neighbors (e.g., industrial facilities, hotels, rental car companies, air freight facilities, hospitals, schools). The sidebar lists the elements of a crisis communications plan.


A crisis communication plan can be part of an airport emergency plan (AEP). The FAA offers guidance for developing an AEP in FAA Advisory Circular 150/5200-31: Airport Emergency Plan. While an AEP is required for Part 139 airports, all GA airports can benefit from adopting and implementing certain parts of such a plan. The University of Minnesota's Airport Technical Assistance Program developed Emergency Guidebook for General Aviation Airports: A Guidebook for Municipal Airport Managers as well as a General Aviation Airport Emergency Plan Template for use in emergency planning and communication planning.

Key resources for airports to use when developing a crisis communication plan include the following:

- *ACRP Synthesis 73: Emergency Communications Planning for Airports*
- *ACRP Report 12: An Airport Guide for Regional Emergency Planning for CBRNE Events*
- *The International Air Transport Association (IATA)'s Crisis Communications and Social Media: A Best Practice Guide to Communicating in an Emergency*

The IATA document and *ACRP Synthesis 73* include sample crisis statements, forms and case studies for use when developing your plan.

### ELEMENTS OF A CRISIS COMMUNICATION PLAN

- Statement of company communication policy, including authorized spokespersons
- Outline of the communication organization and its interface with the corporate crisis management team
- Description of functional roles and responsibilities and candidates to fill them
- Checklists for each functional role, outlining the main tasks
- Templates for initial "holding statements," including initial online posts, which can be issued immediately after key information is confirmed (for various possible scenarios, including aircraft accident, serious incident, diversion, hijacking or other security incident and service disruption)
- Contact lists for important internal and external contacts (including media lists, lists of online influencers and service providers)
- Standard forms and documentation (for example, media call logging form, press conference registration form)

Source: IATA's *Crisis Communications and Social Media: A Best Practice Guide to Communicating in an Emergency*

## Victim Assistance

Following an aviation disaster, an airport operator—whether for GA or commercial service—should be prepared to assist families and survivors affected by the event. Many factors may come into play during the aftermath of an aviation disaster. Airports must understand the operational and logistical needs during this time and should ensure a family or victim assistance program is in place and all agencies and entities understand their roles and responsibilities. Responding organizations will include air carriers or aircraft operators, hospitals, American Red Cross, medical examiner or coroner, ARFF or fire department and police. GA airports may want to include others in the community that may be needed for assistance, such as airport volunteers, city and county government, religious organizations, doctors, mental health professionals and transportation organizations. A communication plan is also a critical piece of the family assistance program to ensure appropriate and timely messages are being communicated to airport personnel, emergency responders, the media, the public and the families of the victims. The designation and process of having a family assistance center should be identified in the plan as well.

The NTSB offers guidance concerning the role of all parties (air carriers, federal agencies, American Red Cross and local agencies) when responding to commercial airline accidents

in its Federal Family Assistance Plan for Aviation Disasters. It includes victim support tasks and checklists that summarize all the appropriate actions to make when responding to an accident.


FAA Advisory Circular 150/5200-31C contains an AEP template that all Part 139 airports must follow and includes some guidance on including provisions for family support following an aviation disaster.

An airport should be prepared for family members who may want to return to the site on the anniversary of the accident to remember their loved ones.

*ACRP Report 171: Establishing a Coordinated Local Family Assistance Program for Airports* provides guidance to airports on how to assist victims and families affected by an aviation disaster. The information in this guide will help an airport ensure a coordinated and compassionate response to survivors and families. It includes a family assistance communication plan, which can be included in the crisis communication plan, and checklists, sample brochures and other materials needed in emergencies. Table 1 of *ACRP Report 171* is a lengthy list of the roles and responsibilities of the airport operator as well as all others involved in an aviation disaster. Two training courses (Appendix 4) that were developed in conjunction with the guide are designed to assist airports with developing their family assistance programs and preparing airport personnel to support family assistance activations. Templates for developing and conducting airport exercises are included in Appendix 5 of *ACRP Report 171*.

CHAPTER 7

# Commercial Service—Attracting Airlines and Transitioning to Airline Service

**This chapter of the guidebook focuses on small airports that serve or could serve commercial passenger service.**

Icons are defined in Figure 1 in Section 1.1.

## 7.1 Transitioning to Commercial Air Service

### Key Insights

*On occasion, an airport will have an opportunity to transition from being a GA airport to being capable of providing commercial service. Multiple factors are involved in the decision to support airline service, including airport certification, security, airport rescue and firefighting, and snow removal, where applicable.*

*Begin the certification process early, and well before scheduled passenger activity is expected, because of the lag time needed to develop an airport certification manual, the time required for the application process and the timing of FAA review and approval.*

*To cut down on the potential costs for attaining Part 139 certification, it is sometimes advisable for airports to operate with a limited certification in anticipation of a full certification in the future. This is subject to budget availability to upgrade and operate under a limited certification for an unspecified period of time.*

### Key Definitions

**Advisory circular**: A series of external, informational FAA publications consisting of non-regulatory material about a policy and providing guidance for compliance.

**Aqueous film-forming foam (AFFF)**: A firefighting agent that is used to coat the burning material, cooling it and preventing its contact with oxygen to suppress the fire.

**Aircraft operations area or air operations area (AOA)**: Any area of the airport used or intended to be used for the landing, takeoff or surface maneuvering of aircraft, including runways, taxiways and, in some cases, ramp areas.

**Aircraft rescue and firefighting (ARFF)**: A special category of firefighting that involves response, hazard mitigation, evacuation and rescue of passengers and crew of an aircraft involved in an airport ground emergency.

**Airport certification manual (ACM)**: A document that details how the airport operator will comply with the requirements of FAR Part 139: Certification of Airports.

**Airport master plan (AMP)**: An assembly of appropriate documents and drawings covering the development of a specific airport from a physical, economic, social and political jurisdictional perspective by assessing current and projected demands. The master plan typically has a time frame of 20 years, with short-, intermediate- and long-term goals within that time frame. The airport layout plan is a part of this plan.

**Airport operating certificate (AOC)**: A certificate issued under FAR Part 139 for the operation of a Class I, II, III or IV airport.

**Airport security coordinator (ASC)**: An airport operator's designated primary and immediate contact for security-related activities and communication with the Transportation Security Administration.

**Code of Federal Regulations (CFR)**: The codification of the general and permanent rules and regulations (sometimes called administrative law) published in the Federal Register by the executive departments and agencies of the federal government of the United States.

**Federal Aviation Regulations (FAR)**: Regulations established by the FAA located in Title 14 of the Code of Federal Regulations. These regulations are the rules that govern the operation of aircraft, airways, airports and airmen.

**Federal security director (FSD)**: A member of the Transportation Security Administration in a leadership role responsible for security operations at federalized airports. An FSD may be responsible for an airport in a geography covering a group of airports.

**Passenger facility charge (PFC)**: A per-ticket charge imposed by a public agency on passengers enplaned at a commercial service airport it controls.

**Security identification display area (SIDA)**: A secure area of the airport that requires an appropriately vetted employee to have and display a security identification badge.

**Sensitive security information (SSI)**: Information that, if publicly released, would be detrimental to transportation security. SSI is not classified information, but there are specific procedures for recognizing, marking, protecting, safely sharing and destroying SSI.

**Sterile area**: An area of controlled access for passengers boarding aircraft.

**Transportation network company (TNC)**: A company that uses an online platform to connect passengers with drivers using their personal, noncommercial vehicles.

**Transportation Security Administration (TSA)**: An agency of the U.S. Department of Homeland Security responsible for protecting the U.S. transportation systems and the traveling public.

## Transition to FAR Part 139 Commercial Service Airport

In addition to potential facility improvements, there are two critical operational changes: holding a FAR Part 139 operating certificate and implementing a security plan.

On occasion, a small airport that is not already supporting commercial passenger operations has an opportunity to initiate commercial passenger service. The opportunity for a small airport to transition from a nonprimary airport to a commercial service and, ideally, a primary airport (an airport with at least 10,000 enplaned passengers per year) can be an exciting opportunity, especially because primary airports receive higher levels of FAA AIP grant funding.


However, the transition will have costs for the airport, especially if the airport does not already hold a FAR Part 139 certificate. Even if the airport is certificated as a Part 139 airport to support unscheduled operations, there are numerous additional requirements, particularly associated with security, that the airport will need to address prior to accommodating scheduled

passenger operations. Also, the airport's ARFF index may change, requiring the addition of ARFF equipment.

An airport operator needs to carefully evaluate the costs and benefits in making this service change. Two major steps must be undertaken to transition to commercial air service: obtain the Part 139 AOC and establish an acceptable security program. Required facilities and equipment will need to be obtained to meet the security and certification provisions. The certification and security program efforts can be undertaken simultaneously to consolidate the time required to complete the process. The process could take between 18 and 36 months to complete. This timeline could be extended depending on the facility improvements that may be required and on the budget that is available.

### *Airport Certification*

Every airport that handles commercial service must complete the certification process as defined by Part 139. Airports are divided into four Part 139 airport classes. The certification requirements vary by class. An airport operator identifies the class of Part 139 certification it is required to carry based on the type of scheduled or unscheduled air carrier operations to be served. As shown in Table 14, Class I Part 139 airports can serve all classes of aircraft required to operate from a Part 139-certificated airport, whereas Classes II, III and IV can only service some types of scheduled or large unscheduled air carrier aircraft.

AOCs serve to ensure safety and conformity in air transportation. To obtain a certificate, an airport operator must agree to certain operational and safety standards and provide for such things as ARFF equipment. These requirements vary depending on the size of the airport and the type of commercial aircraft serving the airport. The regulation, however, does allow FAA to issue certain exemptions to airports that serve few passengers yearly and for which some requirements might create a financial hardship.

Part 139 requires the FAA to issue AOCs as follows:

- To airports that serve scheduled and unscheduled air carrier aircraft with more than 30 seats
- To airports that serve scheduled air carrier aircraft with more than 9 seats but fewer than 31 seats
- To airports that the FAA administrator requires to have a certificate

Airports that accommodate air carrier passenger operations only as a designated alternate airport are not required to be certificated per Part 139.

Any airport operator that desires to serve air carrier operations as specified in Part 139 must comply with the requirements of the rule. The actions required by an airport operator to comply will vary depending on the type of air carrier operations served. Airport operators wanting to

**Table 14. Part 139 Airport certification classes based on type of air carrier operations.**

| | Class of Part 139 Certificate Required | | | |
|---|---|---|---|---|
| **Type of Air Carrier Aircraft to Be Served** | **Class I** | **Class II** | **Class III** | **Class IV** |
| Scheduled large air carrier aircraft (at least 31 seats) | ✓ | ✓ | | |
| Unscheduled large air carrier aircraft (at least 31 seats) | ✓ | | ✓ | ✓ |
| Scheduled small air carrier aircraft (10–30 seats) | ✓ | ✓ | ✓ | |

Source: https://www.faa.gov/airports/airport_safety/part139_cert/classes-of-airports/, accessed August 2017

apply for an AOC must initiate the application process, as prescribed in FAR §139.103. Typically, the AOC application process is as follows:

- The airport operator wanting to apply for an AOC contacts the appropriate FAA Airports regional office to initiate the application process.
- The regional office interviews the airport operator to obtain information about the airport and air carrier operations served or anticipated to be served.
- If the FAA determines that a certificate is necessary, FAA staff will provide the airport operator with an application for certification (FAA Form 5280-1: Application for Airport Operating Certificate) and guidance materials.
- The airport operator submits a completed application (as specified under FAR §139.103) to the regional office for approval. The application package must include two copies of the airport's proposed ACM and written documentation as to when air carrier service will begin. Any requests for exemptions should be submitted at this time (as specified under FAR §139.111).

The FAA reviews the application and associated documentation to ensure they are complete. The FAA also might conduct an inspection of the airport for compliance with the requirements of Part 139. The FAA will work with the airport operator to tailor the ACM to ensure compliance with any revised rules and might request changes to the ACM and any procedures it describes. As the FAA reviews the application and ACM, FAA staff will contact the airport operator to discuss whether additional action is needed and to what extent, if any, air carrier operations can continue until an AOC is issued.

The FAA will issue an AOC if the application and other required documentation meet the provisions of Part 139 and an inspection shows that the airport operator is in compliance with Part 139. The certificate may include other provisions the FAA finds necessary to ensure safety in air transportation.

All airport operators seeking certification must prepare the following for approval by the FAA or TSA as applicable:

- Airport certification manual (FAA)
- Emergency response plan (FAA)
- Snow and ice control plan (as required; FAA)
- Airport security plan (TSA)

The ACM requirements are contained in FAA Advisory Circular 150/5210-22: Airport Certification Manual. This advisory circular provides methods for meeting the certification requirements specified in FAR Part 139.

The written ACM details how the airport operator will comply with the requirements of Part 139. Airport operators that hold a Part 139 AOC already have an ACM. Airport operators that hold an FAR Part 139 limited AOC have a modified version of an ACM, known as airport certification specifications. The ACM is a working document that reflects current airport conditions. It should be easy to maintain and revised as airport conditions or regulations change.

Part 139 requires the airport operator to maintain the ACM in printed form. It can be transmitted to the FAA electronically, but the airport operator should confirm in advance that the FAA can access the file format used.

The organization of the ACM should follow the sequence of sections in Part 139 and in Chapter 5 of FAA Advisory Circular 150/5210-22. The checklists in Appendices 2 and 3 of that advisory circular provide additional guidance on what should be included in each section.

Part 139 requires the airport operator to distribute applicable portions of the ACM to the airport personnel who are responsible for their implementation. The ACM is not intended

to provide complete instructions for all jobs or operational procedures, but it should provide instructions for any critical tasks that are necessary for compliance with Part 139.

### *Airport Emergency Plan*

FAA Advisory Circular 150/5200-31: Airport Emergency Plan provides guidance to the airport operator in the development and implementation of an AEP. Each certificate holder must develop and maintain an AEP designed to minimize the possibility and extent of personal injury and property damage on the airport during an emergency. The emergency plan should be developed as a living document.

One of the emergency plan considerations is staffing. At some small Part 139 airports, the operational employees are cross-trained to provide for required ARFF function.

The AEP should be coordinated with local or regional disaster plans. Consideration should be given to mutual aid and coordination between local or regional resources and airport resources. In addition to law enforcement and firefighting aid, contingencies such as mass evacuation, with the airport being the ingress and egress point, and staging areas for arriving rescue teams should considered. The major components of the AEP are as follows:

- **Basic plan**: Provides an overview of the airport's emergency response organization and its policies.
- **Functional annexes**: Provide plans organized around the performance of broad tasks, such as command and control, communications, health and medical, etc. Because functional annexes are operations oriented, their target audiences are those who perform those tasks.
- **Hazard-specific sections**: Provide additional detailed information applicable to the performance of a particular function in support of a particular hazard. They are prepared when the hazards analysis and regulatory considerations warrant.
- **SOPs and checklists**: Provide detailed instructions that an individual or organization needs to fulfill the responsibilities and perform the tasks assigned in the AEP. Most SOPs and checklists are hazard specific and are attached to each section.

### *Airport Snow and Ice Control Plan*

Each certificate holder whose airport is located where snow and icing occur must prepare, maintain and carry out a snow and ice control plan, as prescribed by FAR §139.313. The plan must include elements and instructions on prompt and timely snow and ice removal and the positioning of removed snow so as not to interfere with aircraft operations in the movement area. It should also address the selection of appropriate snow and ice control materials that minimize engine intake ingestion. Another important part of the plan is the methods for notifying air carriers of airfield conditions.

### *Airport Security Plan*

Many of the security plan development and infrastructure elements required to support commercial airline operations are contained in Section 4.5: Security of this guidebook. While those are recommendations for GA airports, they will become required, in part or in whole, as part of the security program for a Part 139 airport. This section focuses on the mandatory requirements of the airport security plan.

When an airport serves commercial passenger operations, it needs to have in place a written airport security plan. An airport security plan provides the means and methods to be used to provide for the safety and security of persons and property on an aircraft operating in air transportation or intrastate air transportation against an act of criminal violence, aircraft piracy and the introduction of an unauthorized weapon, explosive or incendiary onto an aircraft. It is a written

document that is signed by the airport operator and must be approved by the TSA. An airport security plan that meets 49 CFR Part 1542: Airport Security is required for the following:

- Airports regularly serving aircraft operations required to be under a security program by 49 CFR Part 1544: Air Carriers and Commercial Operators.
- Airports regularly serving foreign air carrier operations required to be under a security program by 49 CFR Part 1546: Foreign Air Carrier Security.
- Airport operators that receive security directives or information circulars issued by the designated official for civil aviation security.
- Airport operators that do not have a security program under 49 CFR Part 1542 that serve an aircraft operator under a security program required by 49 CFR Part 1544, or a foreign air carrier operating under a security program required by FAR Part 1546. Such airport operators must comply with 49 CFR §1542.5(e).

There are three levels of airport security programs, as defined in 49 CFR §1542.103:

- A partial program is required for airports serving air carriers using aircraft (1) with 31 or more but less than 60 seats (2) that do not enplane from or deplane into a sterile area, per 49 CFR §1542.103(c).
- A supporting program is required for airports serving air carriers using aircraft (1) with 60 seats or fewer (2) that are enplaned from or deplane into a sterile area, per CFR §1542.103(b).
- A full program is required for airports serving air carriers using aircraft with more than 60 seats, per 49 CFR §1542.103(a).

An SIDA is required for the complete program. No SIDA is required for either a partial or supporting program.

The airport security plan must include the applicable items and be organized in the same subject area sequence listed in the part of CFR Title 49 corresponding to the required security program. Each airport operator subject to the security program requirements of 49 CFR Part 1542 must maintain one current and complete copy of its security program and provide a copy to the TSA upon request. The distribution, disclosure and availability of SSI, as defined in 49 CFR Part 1520, shall be restricted to persons with a need to know. All requests for SSI by any other person must be referred to the TSA.

The airport security plan may need to contain and identify the following, depending on the type of security program required:

- Security of the secured area, AOA and SIDA, as required for the full security program under 49 CFR §1542.103(a)
- Access control systems
- Fingerprint-based criminal history records checks
- Identification systems
- Training
- Law enforcement support and personnel and personnel who supplement law enforcement
- Records of law enforcement response
- Contingency plan
- Security directives and information circulars
- Public advisories
- Incident management
- Alternate means of compliance
- Exclusive area agreements
- Airport tenant security programs

As part of establishing an airport security plan, an ASC must be designated. The primary duty of the ASC is to oversee the implementation of security requirements stipulated in the airport

security program and accompanying federal, state and local regulations. The airport operator must ensure that one or more ASCs are designated as follows:

- To serve as the airport operator's primary and immediate contact for security-related activities and communications with the TSA. An individual designated as an ASC may perform other duties in addition to those required by the security program.
- To be available to the TSA on a 24-hour basis. In view of this requirement, consideration should be given to the designation of more than one ASC.
- To review with sufficient frequency all security-related functions to ensure that all are effective and in compliance with 49 CFR Part 1542, the security program and all applicable security directives.
- To immediately initiate corrective action for any instance of noncompliance with 49 CFR Part 1542, the security program and applicable security directives.
- To review and control the results of employment history, verification and criminal history record checks as required.
- To serve as the contact to receive notification from individuals who are applying for unescorted access and seeking correction of their criminal history record with the Federal Bureau of Investigation.

When establishing an airport security plan, it is strongly recommended that the airport operator make contact with the nearest FSD early in the process to avoid losing time for security plan approvals. The FSD can usually be located at the nearest commercial service airport. It also is advisable to communicate with other airport managers who have recently completed the certification process to obtain information on what to do and what not to do.

## Facility Considerations

To support the required Part 139 airport certification and airport security plan, additional staff members may need to be added to conduct inspections, maintain facilities, operate equipment or perform security functions. Staff costs must be included in the budgeting process.

In addition, numerous facility improvements may need to be constructed, upgraded or modified; and equipment may need to be purchased to meet the requirements of the AOC, the SICP, the AEP and/or the security program. These projects should be prioritized based on the greatest need for compliance, the availability of grant funding and the budget available to either match grant funding or to fund the projects and equipment acquisitions entirely from available sponsor funds. Facilities that may need improvements in the airport terminal and apron area include the following:

- **Sterile area**: The area must be secure to prevent inadvertent entry. Access to the sterile area will be allowed only to screened passengers and employees with proper identification.
- **Holding area**: The holding area is located within the sterile area and must have adequate space to accommodate the maximum number of passengers that may be anticipated to await boarding of one or more aircraft. Exit doors from the passenger holding area will need to be locked. Furniture will need to be provided for the passengers. Consideration may be given to the installation of vending machines, especially for beverages.
- **Baggage handling area**: Enough space will need to be provided for an inline baggage screener or to allow for hand inspection of the checked luggage.
- **SIDA**: A security identification display area will need to be established on the tarmac in front of the terminal building. Access to this area is restricted to properly badged employees of the airport and any tenant employee involved in servicing the aircraft. An SIDA is only required for those airports subject to the requirements of a full security program (serving aircraft with 60 or more seats), as detailed in 49 CFR §1542.103(a).

- **Screening equipment**: When the security program is approved for a certificated airport, the airport becomes federalized. The TSA will provide the staffing and screening equipment required. During terminal modifications, the space required by the TSA to conduct its operations and install the required equipment must be taken into account. The screening equipment sizes and electrical requirements may vary. Therefore, coordination with the TSA should occur early in the renovation planning process. This will help preserve budget dollars by alleviating expenditures on unneeded or inadequate improvements.

Improvements also may be needed on the landside to accommodate commercial passengers. These may include the following:

- **Access roads**: Roads leading to the airport terminal may need to be improved.
- **Parking areas**: Space for vehicular parking should be adequate to accommodate one car per passenger for the largest aircraft serving the airport. If multiple overlapping flights are anticipated, the parking areas will need to be larger. Short-term and long-term parking may be established.
- **Dropoff areas**: A designated area for dropoff and pickup of passengers by private or public vehicles and taxi cabs should be considered.
- **Smoking areas**: Designated smoking areas may be established in accordance with state and local regulations.
- **Commercial vehicle area**: Paved landside areas adequate to handle buses, vans, taxis, TNCs and other commercial vehicles.

Airside improvements also may be required as part of the airport certification process, especially if the size of the aircraft using the airport will be changing. These improvements may include the following:

- Runway and taxiway pavements and safety areas
- Apron areas
- Lighting and signs
- Navigational aids
- Obstruction clearing
- Buildings to house required equipment
- Snow removal equipment and deicing agents

*ACRP Report 96: Apron Planning and Design Guidebook* and its associated PowerPoint presentation detail the numerous factors that should be considered when planning apron areas to accommodate commercial passenger service.

## ARFF Equipment and Firefighting Agents

The number and size of ARFF vehicles and the extinguishing agents required to be carried on those vehicles will be based on the airport's firefighting index, as shown in Table 15. The firefighting index is calculated by the size of the commercial service aircraft using the airport, also shown in Table 15. The vehicles are not required to be housed at the airport; however, ARFF equipment purchased with grant funds will be required to be housed at the airport and be dedicated to airport operations. Equipment housed off airport property must meet the index requirements, should be off-road capable and must be at the airport during all air carrier operations.

## Airport Master Plan

For the needed improvements to be eligible for grant funding, the AMP and the ALP may need to be updated to include the various certification-required equipment and projects. The

**Table 15. ARFF index requirements.**

| Index | Aircraft Length | Vehicles | Extinguishing Agents |
|---|---|---|---|
| A | <90 ft (<27 m) | 1 | Either 500 pounds of sodium-based dry chemical, halon 1211, or clean agent; or 450 pounds of potassium-based dry chemical and water with a commensurate quantity of AFFF to total 100 gallons for simultaneous dry chemical and AFFF application |
| B | 90 ft (27 m) to <126 ft (<38 m) | 1 | 500 pounds of sodium-based dry chemical, halon 1211, or clean agent and 1,500 gallons of water and the commensurate quantity of AFFF for foam production |
| | | 2 | One vehicle carrying the extinguishing agents as specified for Index A; and one vehicle carrying an amount of water and the commensurate quantity of AFFF so the total quantity of water for foam production carried by both vehicles is at least 1,500 gallons |
| C | 126 ft (38 m) to <159 ft (<48 m) | 2 | One vehicle carrying the extinguishing agents as specified for Index B; and one vehicle carrying water and the commensurate quantity of AFFF so the total quantity of water for foam production carried by both vehicles is at least 3,000 gallons |
| | | 3 | One vehicle carrying the extinguishing agents as specified for Index A; and two vehicles carrying an amount of water and the commensurate quantity of AFFF so the total quantity of water for foam production carried by all three vehicles is at least 3,000 gallons |
| D | 159 ft (48 m) to <200 ft (<61 m) | 3 | One vehicle carrying the extinguishing agents as specified for Index A; and two vehicles carrying an amount of water and the commensurate quantity of AFFF so the total quantity of water for foam production carried by all three vehicles is at least 4,000 gallons |
| E | 200 ft (61 m) and longer | 3 | One vehicle carrying the extinguishing agents as specified for Index A; and two vehicles carrying an amount of water and the commensurate quantity of AFFF so the total quantity of water for foam production carried by all three vehicles is at least 6,000 gallons |

Source: FAA Advisory Circular 150/5220-10E: Guide Specification for Aircraft Rescue and Firefighting (ARFF) Vehicles, June 1, 2011

public must be involved in the process to update the master plan. Input from the public should be obtained on the airport's plan to initiate commercial air service. Public sentiment could adversely affect the proposed transition. Start early in the update process to build consensus.

The proposed improvements on the AMP will require environmental review and documentation. If this is the first time the airport will accommodate commercial service, the results of that change must be addressed as part of the environmental documentation.

## 7.2 Airline Use Agreements

### Key Insights

*Each airport is unique, and there is not a one-size-fits-all approach to airline agreements.*

*The general objective of an airline use agreement is to develop a working relationship between the airport operator and airline(s) as business partners, which will help each party achieve its financial and operational goals and objectives.*

### Key Definitions

**Airline use agreement**: A contract between the airport operator and its tenant airlines that establishes the rights, privileges and obligations for each party and defines how the airport is to be used by the airlines.

**Common-use space**: Nonexclusive areas of an airport used in common by airlines, along with other authorized users of the airport.

**Compensatory rate methodology**: Under this methodology, an airport operator charges its airline tenants fees and rental charges in an amount necessary to recover the actual cost of operating and maintaining the facilities being leased and/or used by the airline parties.

**Cost per enplanement (CPE)**: The average passenger airline payments per enplaned passenger at a given airport.

**Exclusive-use space**: An area rented to an airline for its sole use. Ticket counters, airline operational and administrative offices and airline club rooms are commonly designated as exclusive-use space.

**Preferential-use space**: Space rented to an airline in which it has preferred, but not exclusive, use of the space and may be required to share the space if a certain level of activity is not maintained.

**Residual rate methodology**: Signatory airlines agree to pay any costs of operating the airport system, airport or a specific cost center that are not allocated to other users or covered by non-airline revenues. Signature airlines assume the risk of overall revenue shortfall and receive the benefit from any revenue surpluses.

**Signatory airline**: An airline that executes an agreement with a particular airport. At many airports, these airlines pay lower rates and charges than nonsignatory airlines.

### Overview

An airline use agreement (sometimes called a lease agreement) is a necessary document for every airport with commercial air service. It is the contract between the airport operator and the airlines operating at the airport. The purpose of an airline use agreement is as follows:

- To establish the business arrangement and rate-setting methodology
- To identify premises and facilities leased by airlines
- To define the level of control over the budgeted expenses at the airport
- To identify responsibilities and obligations for indemnification, insurance, environmental issues and other governmental inclusion

*ACRP Report 36: Airport/Airline Agreements—Practices and Characteristics* offers a plethora of information and should be consulted when developing a new airline use agreement or making

changes to an existing agreement. Chapter 3: Business of this guidebook provides additional information on airport revenues and financial management.

The provisions of typical agreements and rates-and-charges negotiation documents may include the use of terminal facilities [can be shared use (common use) or preferential use], schedule of rates and charges, revenue sharing between the airlines and airport, capital projects and noise abatement curfews. *ACRP Report 36* contains a sample table of contents for typical agreements in Appendix B and sample items generally included in rates-and-charges negotiation documents in Appendix D.

## Rates and Charges

One important part of the airline use agreement is the rates and charges. Two rate-setting philosophies are prevalent within the industry: the compensatory model and the residual model. The compensatory model is when the airport operator charges the air carriers fees and rental rates set to recover the actual cost of the facilities and services they use. The airport operator can keep any excess revenue generated but bears the burden of any revenue shortfalls. With the residual model, the airlines assume the risk of paying for operating the airport if there is any revenue shortfall. The airport operator is required to generate as much revenue from other sources as possible. Any excess revenues are returned to the airlines. Under a residual model, the airlines have a majority interest, enabling them to exercise a level of control over airport investment decisions that would affect fees paid by the airlines.

Commonly, an airport operator also may choose to employ a hybrid of these two approaches. For example, a residual approach might be applied to airfield costs in the calculation of landing fees, while a compensatory approach might be used in setting terminal rents. Hybrid rates-and-charges models incorporate parts of each of the residual and compensatory models in a single agreement that may work best for any location and set of circumstances.

Landing fees, terminal rents and fuel flowage fees within an airport's schedule of rates and charges play an important role in how the individual airport market is viewed by existing and potential airlines. The total fee structure that an airline pays at any airport can be quite complex and cover a broad range of usage and real estate types. One of the metrics an airline uses to measure an airport is the total cost, per passenger, that the airline must pay in rents, fees and charges to do business. Airlines use total passenger cost to compare airports of similar size and against the market yield or the profitability that the airline can obtain in a given market.

Rolling up all rates and charges that compose the total costs for a given airline in a given market provides the total CPE. The CPE represents the most critical measurement for both the airline and the airport that wants to develop new service. In setting rates and charges in any of the previously described methods, the airport operator must keep in mind a maximum CPE goal. This goal would allow an airline to continue to make money and serve to attract new airline service. Many of the ultra-low-cost carriers have a very low CPE threshold that would need to be maintained before agreeing to serve in a particular market. Maintaining this very low threshold (sometimes less than $1 CPE) will require the airport to adopt a hybrid rates-and-charges model that will provide the airline with a revenue share.

## Airport/Airline Negotiations

Chapter 3 of *ACRP Report 36* discusses the negotiation process between the airport operator and airline, noting seven steps in a typical negotiation process:

1. Review existing agreement, if there is one, and develop airport operator goals and objectives.
2. Assess airport strengths and weaknesses.

3. Incorporate capital development needs and develop priorities.
4. Prepare rates-and-charges analyses and business proposal.
5. Review of business deal by airport operator.
6. Prepare and review draft agreement.
7. Distribute executable agreement.

### Best Practices for Developing Airline Use Agreements

Several best practices to be considered when developing or changing an airline use agreement are as follows:

- Do your homework before the airline meeting. Understand your financial situation and the flow down of expenses in your budget to the airline(s).
- Understand all parts of the agreement and the rate-setting method desired to be used.
- Prior to the meeting, fully understand the airline's perspective, and what it bases its decisions on. Be ready to offer concessions that meet its goals and perspective.
- Go into the meeting with a feeling for your beginning position and your bottom line position.

## 7.3 Customer Service

### Key Insights

*Airport operators are typically responsible for coordinating the overall customer experience for the passenger's entire movement, from ground transportation to aircraft and aircraft to ground transportation.*

*Airport operators today have become very competitive regarding attracting passengers because passengers have more than one choice as to which airport to patronize. Many times, the level of the customer experience will be the deciding factor.*

*Airport operators must develop partnerships with local government, airlines, tourism companies, and local transportation companies, which can help maintain and improve the overall airport customer experience.*

### Key Definitions

**Airport customer experience**: The net impression of all experiences a customer has in an airport, as judged by customers based on their individual standards, expectations and perceptions.

**Customer service**: The assistance and advice provided by a company to people who buy or use its products or services.

### Importance of Customer Service

Today's airport operators must be committed to providing an excellent airport customer experience. An excellent experience occurs when an airport's ability to exceed its customers' needs and expectations consistently matches customers' perceptions that their needs and expectations are being met. Regardless of airport size or location, improving customer satisfaction has become an important business strategy for airports. Airports should have a well-thought-out customer satisfaction improvement plan. This includes building an airport brand, determining customer priorities, adopting and publishing service standards, implementing a branded customer service program/initiatives, training employees, implementing a performance management system, collaborating with the airport community and communicating with all stakeholders. Some customer service initiatives employed by airports are provided in Figure 20.

### Ensuring Positive Customer Experiences

Airports must work with all parties and stakeholders at the airport to ensure positive customer experiences and high customer service standards. Customers often do not know or care who is responsible for each link in the airport service delivery chain. The airport is often held accountable by the customers, public and media for a poor experience. Key stakeholders and business partners at the airports include the following:

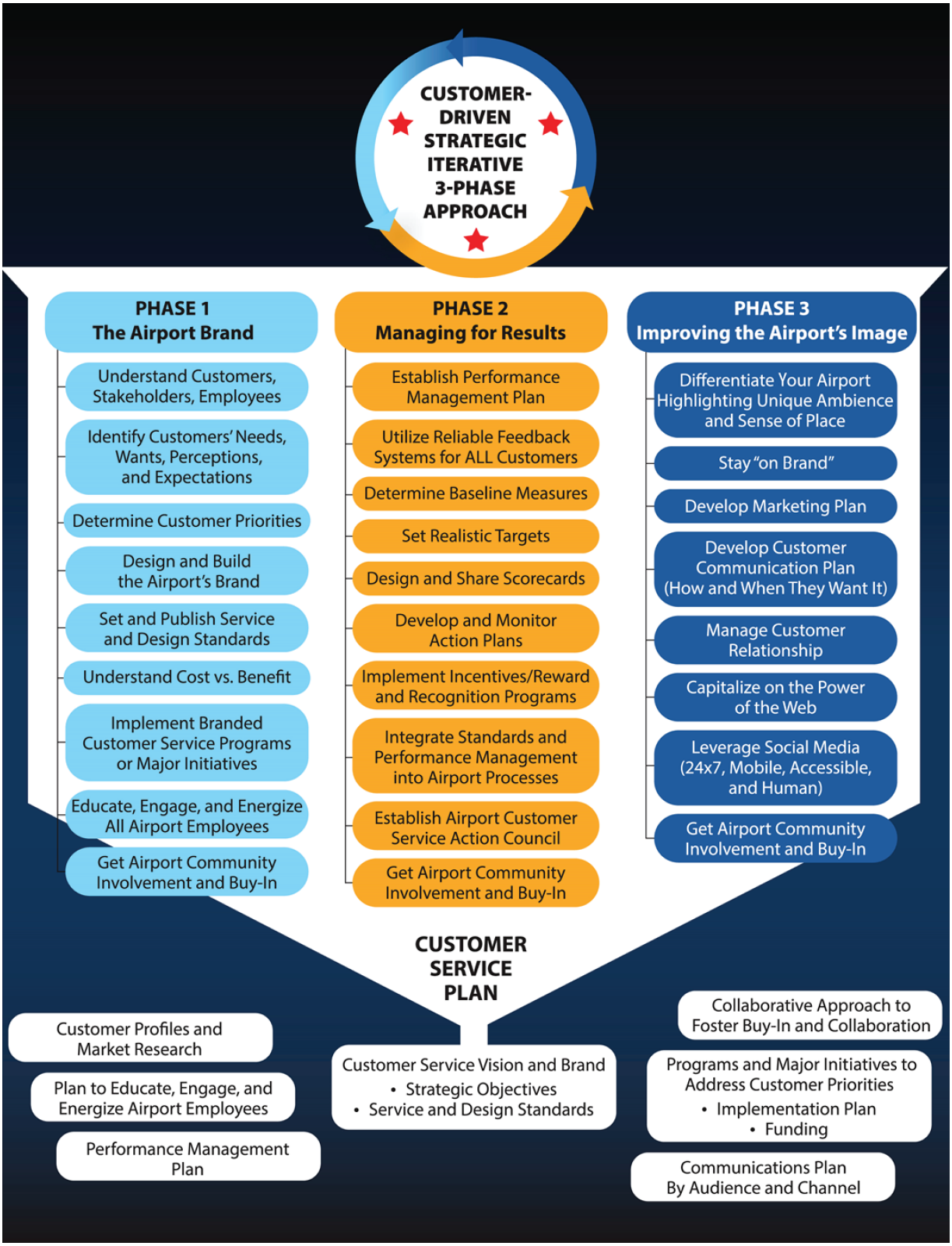
- Airlines
- Federal agencies (TSA and CBP)
- Local agencies (police)
- Ground transportation companies
- Service contractors (custodial, parking, ground handling and concessionaires)


Source: Adapted from *ACRP Report 157: Improving the Airport Customer Experience*, 2016

***Figure 20. Notable customer service initiatives.***

Creating a uniformly excellent customer service experience is challenging, because each of these entities is partly responsible.

*ACRP Report 157: Improving the Airport Customer Experience* notes that airports should take a strategic, comprehensive approach to customer service and adopt an airport-wide customer service brand. This report notes emerging practices in airport customer service management and what airports can do to improve customer experience. Figure 21 shows a road map for implementing a customer satisfaction improvement program that is divided into three phases: developing an airport brand and setting standards, managing for results and improving the airport's image. The report contains a detailed template that uses this road map in Chapter 12 to help airport operators develop a program for the execution of excellent customer service.




Source: © Butterfly Consulting, used with permission

***Figure 21. Road map for implementing customer satisfaction improvement program.***

## 7.4 Air Service Development

### Key Insights

*Airport sponsors have little control over many of the factors that drive airline decisions. Air carriers choose a new service based on a comparative analysis of profitability across communities.*

*Airport sponsors must work closely with community partners and stakeholders to improve air service.*

*Because of regulatory limitations, airport sponsors can offer only certain air service incentives for airlines. It is imperative that each airport sponsor reach out to its local private-sector businesses that benefit from improved air service to encourage them to offer additional private-sector service incentives to airlines.*

*Communication is the most important part of air service development efforts—communication with incumbent and prospective airlines, the community and the governing body on airport costs.*

*Improving and maintaining air service is not a one-size-fits-all problem.*

*The U.S. DOT's Small Community Air Service Development Program provides temporary financial assistance to small communities in order to improve access to the national transportation system.*

*Some states, including Kansas, Wyoming, Virginia and Iowa, have programs in place to provide air service development assistance. You should check with your state to see if any assistance is offered.*

*Air service development is the attraction, initiation, expansion, retention or any improvement of air service and can include changes in pricing, frequency, capacity, hub connectivity or the number of nonstop destinations served.*

### Key Definitions

**Air service development**: The practice of retaining and/or establishing air service to a given airport or community.

**Airport catchment area**: The area surrounding the airport from which it attracts passengers. Most often influenced by the proximity of competing airports.

**Passenger leakage**: The passengers that leave the airport catchment area to access air service from a competing airport instead of the nearest airport, often because of lower fares, more flights or better reliability.

**Passenger revenue**: The multiplication of revenue passenger miles by the yield.

**Passenger yield**: The average fare per passenger mile.

### Overview

Air service development is the practice of retaining and/or establishing air service to a given airport or community. Air service development is a community effort, not just an airport effort. When stakeholders understand and are on board with air service development efforts, the chance of success is much higher. When you approach an airline with requests for improved air service, whether it be a new route, additional flights, larger aircraft or lower airfares, you must show that

you understand your market and the airline operating environment. You must make a strong economic business case and differentiate your community from other markets. You also must show the full support of the community. Commonly, the offer of incentives and rebates for new or improved service also is expected by the airlines.

The *air service section of the aviation toolkit of ACRP WebResource 1: Aligning Community Expectations with Airport Roles* provides information, tools and resources to help educate your community on the realities of air service, the role of an airport in commercial air service and air service development and how to work closely with your community to attract, improve and maintain air service. *ACRP Report 18: Passenger Air Service Development Techniques* identifies methods that have been used in an effort to increase air service or maintain service. It is an excellent educational resource for air service development. *ACRP Report 142: Effects of Airline Industry Changes on Small- and Non-Hub Airports* identifies strategies for airports to market, retain and potentially expand air service and includes case studies.

## Evaluating Your Market to Pursue and Retain Air Service

Airport managers and communities must understand their market's potential for supporting air service, as well the airline industry in general, to understand where their opportunities are to gain or improve air service. While commercial air travel demand will be primarily driven by local demand and regional events, it also will be influenced by industry events. *ACRP Report 98: Understanding Airline and Passenger Choice in Multi-airport Regions* provides an assessment of a system that includes nonhub primary airports in central Wisconsin and the factors that influence a passenger's choice in airports. An ACRP recorded webinar, titled "Factors That Influence Air Service Development," is also available.

### *Understand the Airline Operating Environment*

It is extremely important to understand the fundamentals of the commercial airline industry and the trends that are shaping carrier decisions, especially when it comes to smaller airports. Energy prices, airline competition, aircraft availability, pilot availability, seasonality and the regulatory environment are just a few examples of items you must understand. Airline bankruptcies also affect airports, as discussed in *ACRP Legal Research Digest 6: The Impact of Airline Bankruptcies on Airports*. The following recent trends have and will continue to have the potential to affect air service.

**Airline Rightsizing and Capacity Discipline.** In response to the recession of 2007–09, airline management focused on profitability by cutting unprofitable and redundant flying and minimizing the number of empty seats. Overall, commercial service operations and domestic seat capacity at all U.S. airports declined. In addition, many of the mainline/network carriers no longer operate the aircraft needed to cost-effectively serve small airports, because they have transitioned routes they once served to regional partners that, for now, continue to operate aircraft with smaller seating capacities. U.S. airlines have been profitable over the last several years, and service and passengers have increased. However, a conservative approach in airline capacity planning remains. There will likely be a "limited growth" environment for the airlines in terms of seat capacity in the near term. Most airlines will remain capacity-disciplined.

**Airline Consolidation and Restructuring.** Airline consolidation in the last decade, including the mergers of American Airlines and US Airways, Delta and Northwest Airlines, United and Continental Airlines, and Southwest Airlines and AirTran Airways, has left the United States with just four mainline/network carriers (including Alaska) and several "low-cost" carriers. Consolidation, as well as a focus on yield improvement, led to improved capacity

rationalization (fewer departing seats). It is anticipated that the remaining consolidated carriers will continue to operate based on cost-cutting strategies, driven by profit margins.

**Limited Aircraft.** The strong growth in the 1990s and early 2000s of the 37- to 50-seat regional jet (RJ) to replace turboprop aircraft in small markets and to supplement narrow-body jet aircraft in larger markets ended following the spike in jet fuel costs during 2007–08. It was no longer as economical to fly RJs to provide service to short-haul markets. Operational costs, coupled with the economic recession and curtailed demand, led to the rapid retirement of small RJs throughout all airline networks. It is anticipated, however, that the small RJs will continue to have a presence in airline route networks, albeit to a much lesser extent. The migration of network carriers to aircraft with higher seating capacities, in search of lower costs, has left many smaller communities with fewer choices in terms of carriers and equipment.

**Pilot Supply.** A nationwide commercial pilot shortage is anticipated to occur in the next several years; this shortage could affect commercial airports across the United States. Pilot retirements and fewer pilots coming from the military have reduced the pool of commercial pilots. Further, impediments to becoming a new commercial pilot—including the 1,500-hour rule for flight training to obtain a commercial pilot license and the financial burden of flight training—and low early-career salaries have constricted the pipeline of new pilots. Regional carriers (and the airports they serve) are feeling the impact first from the pilot shortage, because regional carriers typically hire the new pilots, who then move up to network carriers. Many regional carriers are working on partnerships with universities and other programs to increase the pilot supply, but it will take time to see any improvement.

**Airfares and Growth of Ancillary Revenues.** The price for air travel is a significant factor that influences demand. In general, airfares are influenced by airline operating costs and by competitive influences. Nationally, fares saw a downward trend over the last decade, due largely to changes in fuel prices and the "decoupling" of the ticket price from ancillary services such as baggage fees, seat fees, reservation changes and food and drink purchases. U.S. carriers have posted net profits for 5 consecutive years, due to, in part, ancillary revenues.

### *Understand Your Market*

Communities must demonstrate that demand exists in their markets for the airlines. Population and economic strength often drive passenger demand, so you must understand your local economy and air service market before you can ask for improvements.

Several subscription passenger data services can be used to determine historic passenger trends by destinations, air fares, seasonality, load factors and historic numbers of flights and seats. Passenger and booking studies can help you understand travel habits and the ability to fill larger aircraft. You should define your airport's catchment areas (see *ACRP WebResource 1*, Defining Your Airport's Catchment Area, and measure "leakage" to understand market demand. Leakage is based on numerous factors, including population, income levels, local economic activity, proximity to alternative airports, nonstop service or connections, airfares and comparing costs. This can be a complex exercise, so using a consultant may be helpful.

Perhaps the most important data, because it cannot be easily obtained by airlines, is specific local business information. Private-sector data is a key driver for airline route evaluation. You need to know where businesses are going and which businesses are coming to your market, and you need to quantify that number. Ask business stakeholders to put their commitments in writing. If you have identified a new route, garner support and influence from interested parties in the destination market as well (tourism, chambers of commerce, airports, etc.).

### *SWOT Analysis*

An air service SWOT analysis can help you understand competitive advantages and disadvantages for air service improvements. A SWOT analysis can help you and the community make decisions on what improvements to pursue and how to craft your case for improvements. A few items to consider when developing a SWOT analysis include the following:

- Historic or projected socioeconomic growth in region
- Major employers that rely on air service, tourism or other visitor travel
- Size of catchment area
- Existing airport facilities and airline charges
- Incentive and marketing program for airlines
- Passenger trends

The SWOT analysis should use this data to examine:

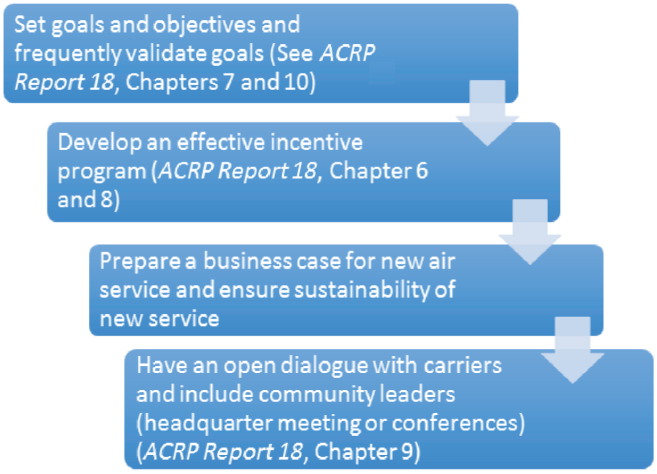
- **Strengths**: The strengths that you want the airport to maintain, build on and use
- **Weaknesses**: The weaknesses that you want the airport to remedy or eliminate
- **Opportunities**: The opportunities that you want the airport to prioritize and optimize
- **Threats**: The threats that you want the airport to address

Typically, strengths and weaknesses are more focused on external perceptions of the airport, while opportunities and threats are more focused on outside influences.

Chapter 4 of *ACRP Report 28: Marketing Guidebook for Small Airports* provides guidance on developing a SWOT analysis. *ACRP WebResource 1* provides an air service toolkit that can assist with SWOT efforts: SWOT Analysis Considerations (Word file).

## Developing a Practical Air Service Plan

The key to attracting and maintaining service is that an air service development plan must be in place, clear and community driven, not just airport driven. An air service task force can be formed to identify the air service goals and objectives, gather information on air service needs, agree on incentives and develop the business case for new service. Establishing the air service goals is one of the steps in developing air service, as shown in Figure 22. The key stakeholders




Adapted from *ACRP Report 18: Passenger Air Service Development Techniques*, 2009

***Figure 22. Steps for developing an air service plan.***

of air service development efforts include major employers, the local chamber of commerce and tourism board and the local economic development agency and/or other parts of the local municipal government. Stakeholder involvement in an air service task force will show community commitment and demand for service. More information on developing an air service task force, and a tool to identify potential task force members, can be found in *ACRP WebResource 1*. A realistic air service development plan must be based on underlying local demand, not just incentives. New markets must be backed and aligned with local corporate objectives. Types of incentives that can be considered will be discussed later in this section.

## When to Use and How to Select an Air Service Consultant

Sometimes air service development can seem to be an overwhelming task. Many larger airports have staff strictly tasked with air service development. Smaller airports may not have the resources to hire staff or commit existing staff to air service development efforts. Air service development consultants offer a variety of services in various price ranges to assist an airport with its needs. Typical services provided by air service consultants include the following:

- Business case analysis for potential and current routes
- Leakage and retention analysis
- Fare structure and pricing analysis
- Airline schedule analysis
- Airport/new route economic impact analysis
- U.S. DOT data and statistical reporting/analysis at various intervals
- Development of incentives
- Assistance with Small Community Air Service Development Program (SCASDP) grant proposals
- Community coalition/partnership establishment and interaction

*ACRP Report 28* provides additional information on managing air service and community expectations.

Using an air service consultant may seem like an expensive proposition; however, air service development consultants have an understanding of what the airlines need and desire, often have airline contacts and have access to data resources that may be too expensive and time consuming for an airport to obtain and analyze. Also, an air service consultant can be engaged to the level needed, which may be less expensive than adding staff. When considering an air service consultant, the cost should be considered during an airport's budgeting process. Other mechanisms for funding air service development consultant studies and assistance could include SCASDP grants, state air service programs and private local funding.

When selecting a consultant, consider their track record for assisting airports to improve air service, ensure that they have worked with similarly sized airports, see if they have contacts for airlines you are pursuing and ask for references from other communities. Also, consider the location of the airport the consultant has supported, i.e., is the airport a competitor or a desired destination airport?

## Air Service Incentive Programs

Air service development is competitive and a difficult proposition in today's airline operating environment. An incentive program should be considered to provide cost savings and ensure the airlines will make money on their routes. This should be spearheaded by community representatives, not just the airport. A community must weigh the cost of the investment in incentives with the likelihood its market can sustain the service once incentives end. Although incentives

can influence airline decisions, local economic growth and market demand will be the drivers of success.

Types of incentives that can be considered include discounted/waived landing fees, marketing, facility upgrades, travel banks, revenue guarantees, pledges of support, subsidies and provision of above- or below-wing services. A definition of, and more information on, each of these incentives can be found at Definitions of Air Service Incentives in *ACRP WebResource 1*. In addition, a sample incentive plan can be found in *ACRP Synthesis 68: Strategies for Maintaining Air Service*.

To adhere to federal grant assurances and policy, airport sponsors may use airport revenues for airline incentives only as specified by the FAA (see box at right). An airport sponsor may not use airport revenues to promote any kind of general economic development, for cash subsidies or minimum revenue guarantees. Cash subsidies or minimum revenue guarantees, when offered, can be offered only by an outside entity such as a chamber of commerce, private business or economic development agency. The FAA provides guidelines in accordance with federal statutes on funding incentives in the FAA's Air Carrier Incentive Program Guidebook: A Reference for Airport Sponsors.

**Airport Revenue Use for Air Service Incentives**

The FAA allows airports to fund promotional incentives such as fee waivers or to use airport revenue for acceptable promotional costs where the purpose is in support of clearly defined air carrier development program goals for new service. New service is defined as service to a destination not currently served, nonstop service where no nonstop service is currently offered, a new entrant air carrier or increased frequency of flights to a specific destination.

Incentives may be offered only to new carriers for no more than 1 year.

Existing carriers may be offered incentives for service to a new destination.

## Small Community Air Service Development Program

The SCASDP is a U.S. DOT grant program that was developed to help small communities address air service issues. The program is limited to 40 grant awards per year with a maximum of four grants per state. The grants range from $20,000 to $1.6 million. In 2016, the average grant awarded was $500,000. SCASDP grants are only available to non- and small-hub airports. Eligible communities must show that they have higher-than-average fares or insufficient service. Grant applications also must show local participation, such as local cash contributions, public–private partnerships or timely use of funds, and that the grant would benefit a broad segment. New and innovative approaches to air service development also are often considered. In 2016, SCASDP grants were awarded for revenue guarantees, marketing programs and airline fee waivers to offset startup costs. Other grants in the past have been given for aircraft upgrades or research studies. An SCASDP presentation by the U.S. DOT is included in *ACRP WebResource 1*.

## 7.5 Essential Air Service Program

### Key Insights

*Essential Air Service has been provided to the most rural airports in the United States since airline deregulation in 1978.*

*Essential Air Service carriers shifted dramatically over the past decade, going from 19-seat turboprops to 9-seat or 30-seat-plus operators.*

### Key Definition

**Essential Air Service (EAS)**: A U.S. Department of Transportation program that guarantees that small communities that were served by scheduled airlines prior to deregulation will maintain a minimal level of scheduled commercial service.

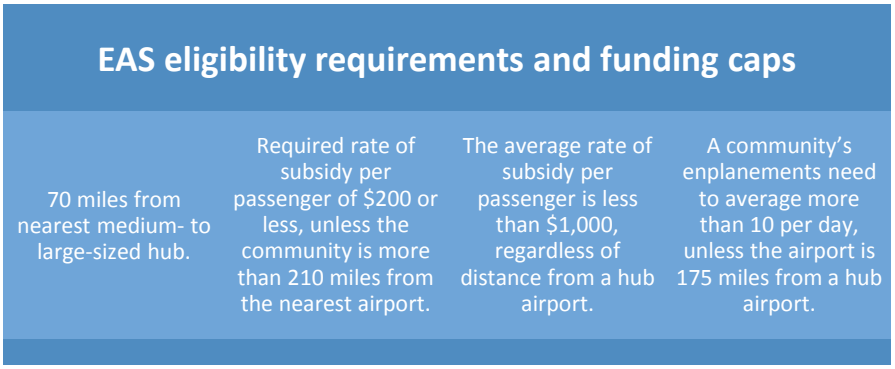
### Essential Air Service

Through the Airline Deregulation Act, the U.S. DOT has provided subsidies for scheduled service to the most rural U.S. airports through the EAS program since 1978. The program was modified and extended by the Airport and Airway Safety and Capacity Expansion Act of 1987 and later made permanent as part of the Federal Aviation Reauthorization Act of 1996. The EAS eligibility requirements and funding caps are shown in Figure 23.

There are 172 rural airports that are served across the United States, including Alaska, under this program. Basic information regarding the program and its requirements can be found on the U.S. DOT Essential Air Service website. Changes to community eligibility and funding caps have recently been added to the program.

### Industry Changes and the Impact on Essential Air Service

The oil spike and the economic recession experienced by the airline industry in the late 2000s had a detrimental impact on small communities throughout the United States. Airline consolidation and capacity discipline have again led to airline profits. However, future capacity growth will continue to be constrained. The continued phaseout of the 50-seat RJ aircraft, in addition to pilot shortages, is expected to continue to have major negative effects on small airports in the




Source: U.S. DOT, 2017

***Figure 23. Essential Air Service eligibility.***

future. The reductions in the 50-seat RJ as well as the 19-seat and 34-seat turboprop aircraft have left few economical options to serve EAS markets. The remaining options appear to be 76-seat RJs or small (9-seat) turboprop aircraft.

Legislation that passed Congress in 2013 imposed new rules on pilots, including mandating co-pilots possess an airline transport pilot (ATP) certificate that requires a minimum of 1,500 hours (compared to 250 hours previously needed by co-pilots). This has dramatically increased the time and cost of becoming a pilot, and, as experienced pilots are moving to larger network carriers, it is leaving regional carriers that provide EAS without replacements.

Annual EAS subsidies are continuing to rise, reaching over $277 million in 2017. Load factors at EAS airports are, on average, below 35 percent. This is an unsustainable trend and will likely lead to more changes to the EAS program in the future. Almost as long as the program has existed, there has been political pressure to discontinue it in order to reduce federal spending.

## 7.6 Common-Use Facilities

### Key Insights

*Common-use facilities offer a cost-effective solution to retain and encourage new air service.*

*When considering common-use facilities, airport operators must consider many factors, including carrier allocation, the size of the airport, the use of current facilities and the planned future use of facilities.*

*The key agents to success for implementing common use include stakeholder intercommunication, top-down management support and commitment from all parties.*

*Common-use facilities that offer a lower cost per enplanement for the airlines are an attractive attribute that should be communicated to the airlines.*

### Key Definitions

**Common use**: A facility allocation and management approach intending to maximize airport facility access and allocation through nondedicated resources, a shift from the traditional tenant–landlord relationship. It comprises primarily flexible-use ticket counter and gate kiosk space.

**Common-use system**: Airport-operator-provided hardware and software systems that provide an interface through which airline proprietary systems can operate with increased facility utilization and flexibility.

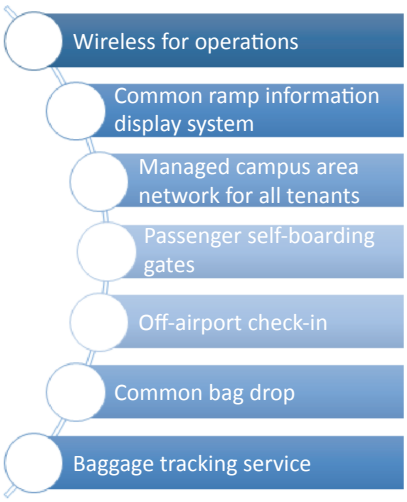
### Considerations for Common Use

The current airline operating environment is driven by the need for cost savings and cautious capacity increases. To retain existing service or encourage new service, the airport operator must often offer airlines cost-effective solutions. Airport operators, particularly at smaller airports that may have less frequent operations, can accomplish this by offering the airlines common-use facilities and services. This philosophy moves away from the traditional model in which airline facility use and leasing are focused on dedicated facilities. Types of common-use facilities are shown in Figure 24.

*ACRP Report 30: Reference Guide on Understanding Common Use at Airports* can help airport operators identify and understand the financial, operational, liability, safety, customer service and competitive elements of a common-use approach to the utilization of airport facilities and the provision of services. Appendix A includes case studies. *ACRP Report 30* includes a virtual interactive tour of an airport, allowing the user to focus on different areas of interest. It also includes spreadsheet models to analyze and evaluate how to integrate common use.

If an airport is considering transitioning to common use, it is best practice for the change to coincide with the scheduled negotiation for developing a new rates-and-charges agreement.

Appendix D of *ACRP Report 30* provides 12 steps for developing a road map to common use, from the initial consideration to the execution, and includes lessons learned. When an airport operator is considering common use, it must also consider the costs and benefits associated with common use—including the need to hire a consultant, impact on staffing, modifications to facilities, and procurement of additional assets and business drivers—such as whether common use will improve the customer experience, maximize facility utilization or decrease costs.




Source: *ACRP Report 30: Reference Guide on Understanding Common Use at Airports*, 2010

***Figure 24. Types of common-use facilities.***

There also are many operational areas to be considered when implementing common use. They include planning, design and construction, terminal operations, airside operations, facilities maintenance, business considerations and technology. Each of these areas is discussed in detail in Chapter 3 of *ACRP Report 30*.

## 7.7 PFC and CFC Funding Sources

### Key Insights

*Passenger facility charges and customer facility charges provide additional funding mechanisms for commercial service airports.*

*Imposition and use of revenue from passenger facility charges must be approved by the FAA.*

*Customer facility charges can be used to finance rental car services, parking garages and other customer-demand-based facilities and access.*

### Key Definitions

**Customer facility charge (CFC)**: A fee paid by airport customers for the use of some non-aeronautical services at an airport, commonly collected by rental car companies to pay for their facilities.

**Passenger facility charge (PFC)**: A program for the collection of fees per enplaned passenger per flight segment, with a maximum of two flight segments.

### Overview

Airlines retain a processing fee out of the PFCs collected. Also, PFCs are collected at the time a ticket is sold, not when it is used.

For airports with passenger service, PFCs and CFCs provide two additional funding mechanisms for facilities. The FAA PFC program allows for the collection of a PFC of up to $4.50 per enplanement. PFCs are capped at $4.50 per flight segment with a maximum of two PFCs charged on a one-way trip or four PFCs on a round trip, for a maximum of $18 total. Airports use these fees to fund FAA-approved projects that enhance safety, security or capacity; reduce noise; or increase air carrier competition.

The CFC is a user fee imposed by an airport on each parking or rental car user and collected by the facility operator. CFCs are regulated on the state level, not the federal level, so authorization and collection can vary by state. CFC revenues are more typically used to finance rental car-related projects, such as rental car space, rental car quick-turnaround facilities, consolidated rental car facilities (ConRACs) and related roadways. The CFC is collected for each transaction or each transaction day.

### How to Request PFC Funding for a Project

Several steps must be followed to request PFC funding for a project. To obtain approval, projects must meet certain eligibility criteria, as outlined in FAR Part 158: Passenger Facility Charges. FAA Order 5500.1: Passenger Facility Charge provides guidance and procedures to the FAA and is a useful tool for airports as well. The FAA presentation "PFC 101—An Overview" provides additional information on the PFC program.

Airport sponsors must develop a PFC application and coordinate with the FAA before conducting an airline consultation. Sponsors of small-, medium- and large-hub airports must follow a traditional application process. Sponsors of nonhub airports may follow a more streamlined process that includes a notice of intent. The general steps include the following:

1. **Formulation of PFC project**: The airport sponsor (public agency) develops a list of projects that will use PFC funds and consults with the FAA. The airport sponsor develops a project description and costs and notifies the airlines of the consultation meeting.

2. **Airport–airline consultation meeting**: Thirty to 45 days after notification, the airport meets with the air carriers and discusses the PFC charges and projects. The airlines will provide the certification of agreement or disagreement no later than 30 days later.
3. **PFC application**: The airport sponsor prepares and submits a draft PFC application to the FAA. The draft must meet FAA grant assurances. After receiving comments on the draft, the airport sponsor sends it to the FAA for approval.
4. **FAA actions and approval**: The FAA will determine if the application is complete and has 120 days to complete a review. The FAA will file a notice for publication in the Federal Register and allow 30 days for public comment. The FAA will prepare an ROD and approve or disapprove the application.
5. **PFC approval and collection**: After the application is approved, the airport sponsor will notify the air carriers to begin collection. Air carriers remit PFCs to airport operators (typically the airport sponsor) monthly, and airport sponsors must submit a quarterly report to the FAA.

## CFC Specifics

CFCs are considered a local funding mechanism and are, therefore, different from FAA-managed grants of PFCs. A CFC can be used for appropriate capital and operating expenses, for the operation of a consolidated rental car facility or for a common busing system to the consolidated rental car facility. In addition, if an airport operator chooses to use part of an existing parking garage for rental car operations, a CFC may also be used to build parking facilities and replacement parking space elsewhere. The CFC rate is typically adjusted from time to time to provide adequate revenues associated with its obligations. Therefore, the CFC rate is determined at the airport level. These charges are typically collected monthly and are part of a lease-and-concession agreement with on-airport rental car companies that requires them to collect a CFC for all rentals originating at the airport. For more information, the ACI–North America has created the presentation "Rental Car Customer Facility Fees and Financings."

## 7.8 Planning for Irregular Operations

### Key Insights

*It is extremely important to have a well-thought-out and comprehensive formal irregular operations (IROPS) plan in place.*

*Good communication, collaboration and cooperation are the keys to prevent and respond to events that lead to delays and unwanted impacts on the traveling public.*

### Key Definitions

**Irregular operations (IROPS)**: Events that disrupt optimized flight schedules and negatively impact the normal flow of passengers through the air transportation system.

**Irregular operations (IROPS) champion**: The point person who has been identified by an airport's management as responsible for handling coordination between all service providers and developing an airport's IROPS plan.

### Overview

Irregular operations at commercial service airports have the potential to cause a myriad of challenges, including tarmac delays, passenger surges in terminal and security areas, terminal passenger counts reaching capacity, off-hour staffing conditions for security and concessions, passenger conditions during extended stays in terminals and accommodating special needs passengers. In the last 10 years, there has been a push toward preventing these problems. The U.S. DOT has passed rules to limit tarmac delays and protect passengers during delays. In addition, the FAA Modernization and Reform Act of 2012 required airport operators to file tarmac delay contingency plans every 5 years.

Airports that have implemented plans for dealing with IROPS situations tend to have fewer negative experiences during these times. Airport IROPS plans address a variety of topics, including facilitating communication, providing facilities and supporting airline response efforts. Plans can vary from simple to complex.

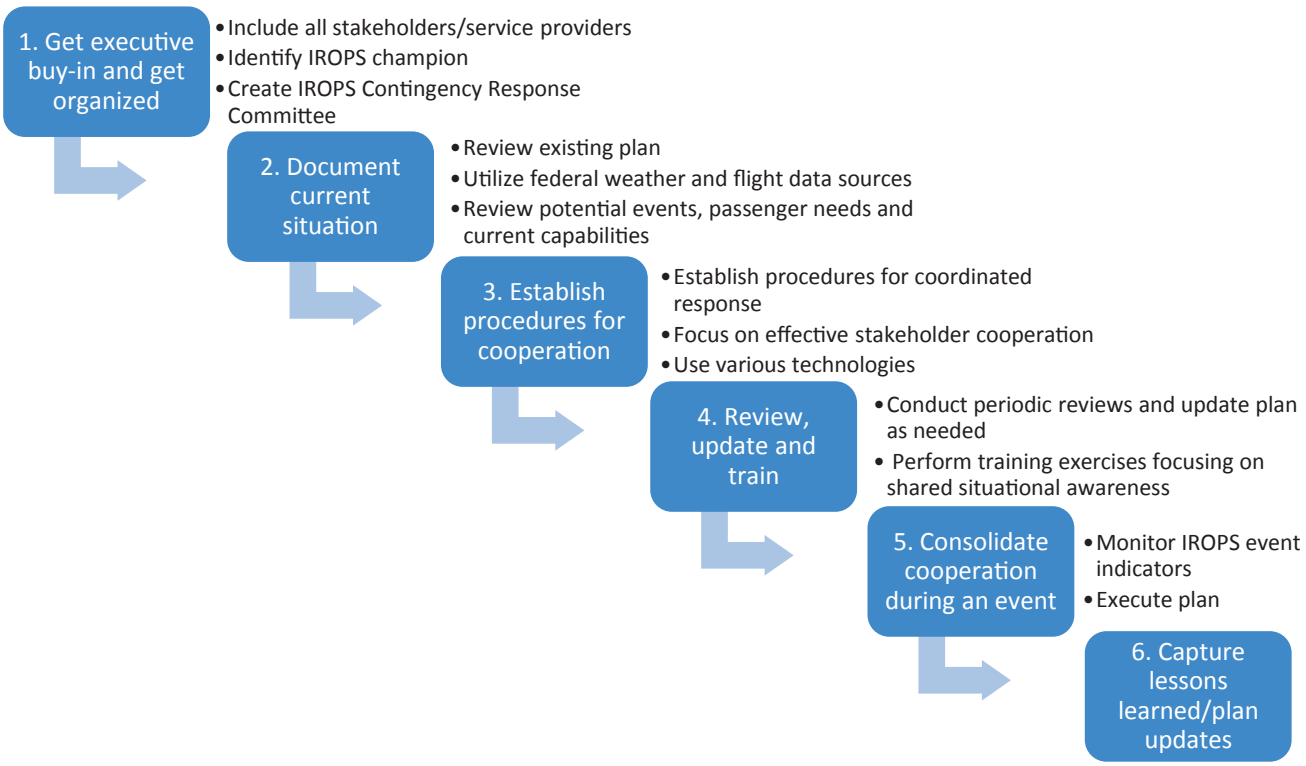
ACRP has developed several detailed guidebooks to help you prepare for IROPS situations and reduce IROPS impacts on passengers:

- *ACRP Report 65: Guidebook for Airport Irregular Operations (IROPS) Contingency Planning*
- *ACRP Report 106: Being Prepared for IROPS: A Business-Planning and Decision-Making Approach*
- *ACRP Report 153: Guidebook for IROPS Stakeholder Communication and Coordination*

At the core of a successful IROPS plan is communication. Continuous communication, cooperation and coordination between the airport and each of the stakeholder groups or local service providers (airlines serving the airport, airlines that have reported using an airport as a diversion airport, airport operations, the TSA, the FAA, the CBP, concessionaires, FBOs, etc.) are required for a unified response during an IROPS event. A truly effective plan cannot be created without a coordinated effort and a cooperative response.

### Steps of IROPS Planning Process

*ACRP Report 65* outlines the six fundamental steps for implementing an effective IROPS plan, which are shown in Figure 25, and *ACRP Report 153* expanded the process. Both ACRP reports




Source: Adapted from *ACRP Report 65: Guidebook for Airport Irregular Operations (IROPS) Contingency Planning*, 20p12 and *ACRP Report 153: Guidebook for IROPS Stakeholder Communication and Coordination*, 2016

***Figure 25. Steps of the IROPS process.***

contain information and various resources, checklists and tools to support each step as well as sample IROPS plans to support your IROPS planning efforts.

## Key IROPS Planning Tools

*ACRP Report 65* and *ACRP Report 153* each contain many useful tools, samples and checklists to assist in the development of IROPS plans. These resources, which are intended to be used in conjunction with the guidebooks, include the following:

- *ACRP Report 65*
  - Resource A – Topics for IROPS Plan Development
  - Resource B – Model IROPS Contingency Plan
  - Resource C – Tools (for IROPS plan implementation)
- *ACRP Report 153*
  - IROPS Risk Assessment Tool and Users Guide
  - IROPS Tabletop Planning Guide and Scenarios
  - Checklists for IROPS Stakeholder Communication and Coordination

# Aviation-Related Abbreviations

| | |
|---|---|
| **A4A** | Airlines for America |
| **A/A** | air/air |
| **A/C** | aircraft |
| **A/G** | air to ground |
| **A/I** | accident(s)/incident(s) |
| **AAAE** | American Association of Airport Executives |
| **AAC** | aircraft approach category |
| **AAE** | accredited airport executive |
| **AALS** | advanced approach and landing system |
| **AASR** | airways and airport surveillance radar |
| **ABT** | about |
| **ABV** | above |
| **AC** | advisory circular |
| **ACAD** | automated computer-aided design (operator-input+display system) |
| **ACE** | airport certified employee |
| **ACI** | Airports Council International |
| **ACID** | aircraft identification (ICAO) |
| **ACI-NA** | Airports Council International–North America |
| **ACIP** | Airports Capital Improvement Plan |
| **ACL** | altimeter check location |
| **ACM** | airport certification manual |
| **ACPT** | accept or accepted |
| **ACR** | air carrier |
| **ACRP** | Airport Cooperative Research Program |
| **ACS** | airport certification specifications |
| **AD** | airworthiness directive |
| **ADA** | Americans with Disabilities Act of 1990 |
| **ADF** | automatic direction finding |
| **ADG** | airplane design group |
| **ADM** | administrative/administration |
| **ADO** | Airports district office |
| **ADPG** | ATM data processing sub-group |
| **ADS-B** | automatic dependent surveillance–broadcast |
| **ADZ** | advise |
| **ADZD** | advised |
| **ADZY** | advisory |
| **AEP** | airport emergency plan |
| **AFB** | Air Force base |

| | |
|---|---|
| **AFFF** | aqueous film-forming foam |
| **AFSS** | automated flight service station |
| **AGL** | above ground level |
| **AIM** | Aeronautical Information Manual |
| **AIP** | Airport Improvement Program |
| **ALP** | airport layout plan |
| **ALPA** | Air Line Pilots Association, International |
| **ALRT** | alert |
| **ALS** | approach lighting system |
| **ALT** | alternate |
| **ALT** | altitude |
| **AMGR** | airport manager |
| **AMP** | airport master plan |
| **AOA** | air operations area |
| **AOC** | airport operating certificate |
| **AOCI** | Airport Operators Council International |
| **AOPA** | Aircraft Owners and Pilots Association |
| **AOZO** | airport overlay zoning ordinance |
| **AP** | airport |
| **APAPI** | abbreviated precision approach path indicator |
| **APCH** | approach |
| **APL** | aircraft parking line limit |
| **APLGT** | airport lighting |
| **APP** | approach center/control (office/service) |
| **APRC** | approach reference code |
| **APRT** | airport |
| **APT** | airport(s) |
| **APV** | approach with vertical guidance (for GPS approaches) |
| **ARC** | airport reference code |
| **ARFF** | aircraft rescue and firefighting |
| **ARINC** | Aeronautical Radio Incorporated (a nonprofit corporation owned by member airlines to define form, fit and functions of avionics equipment) |
| **ARP** | airport reference point |
| **ARTCC** | air route traffic control center |
| **ARTS** | automated radar terminal system |
| **ASC** | airport security coordinator |
| **ASD** | air service development |
| **ASDA** | accelerate-stop distance available |
| **ASMGCS** | advanced surface movement guidance and control systems |
| **ASOS** | automated surface observation system |
| **ASPH** | asphalt |
| **ASR** | airport surveillance radar |
| **ATA** | actual time of arrival |
| **ATC** | air traffic control |
| **ATCT** | airport traffic control tower |
| **ATIS** | automatic terminal information service |
| **ATO** | Air Traffic Organization |
| **ATP** | airline transport pilot |
| **AUTH** | authority |
| **AUTH** | authorized or authorization |
| **AUTOCAD** | automatic computer-aided design |

| | |
|---|---|
| **AVAIL** | available |
| **AVBL** | available |
| **AVG** | average |
| **AVGAS** | aviation gasoline |
| **AWOS** | Automated Weather Observing System |
| **BAS** | building automation system |
| **BASE** | cloud base |
| **BASH** | bird aircraft strike hazard |
| **BC** | patches (meteo) |
| **BCN** | beacon |
| **BKN** | broken (meteo) |
| **BL** | blowing (meteo) |
| **BRL** | building restriction line |
| **BYD** | beyond |
| **CAP** | civil air patrol |
| **CATEX** | categorical exclusion |
| **CAT I** | facility providing operation down to 200-feet decision height and runway visual range not less than 2,600 feet |
| **CAT II a** | facility providing operation with no decision height limit to and along the surface of the runway, with external visual reference during final phase of landing and with a runway visual range not less than 700 feet |
| **CAT II** | facility providing operation down to 100-feet decision height and runway visual range not less than 1,200 feet |
| **CAT x** | Category x precision approach (I, II or III) |
| **Cat** | category |
| **CBP** | U.S. Customs and Border Protection |
| **CCTV** | closed-circuit television |
| **CEQ** | Council on Environmental Quality |
| **CFC** | customer facility charge |
| **CFI** | certified flight instructor |
| **CFR** | Code of Federal Regulations |
| **CHRC** | fingerprint-based criminal history records checks |
| **CIG(s)** | ceiling(s) |
| **CIP** | capital improvement program |
| **CMG** | cockpit to main gear |
| **CMSND** | commissioned |
| **COM** | communications (ICAO) |
| **CONC** | concrete |
| **CONDAR** | conflict detection and resolution |
| **CONDOR** | confidential direct occurrence report |
| **CONF** | conflict |
| **CONFACP** | conflict accept |
| **CONOPS** | Concept of Operations Mode S in Europe |
| **CONP** | connection-oriented network protocol |
| **ConRACs** | consolidated rental car facilities |
| **CONS** | continuous |
| **CONST** | construction or constructed |
| **CSPP** | construction safety and phasing plan |
| **CTAF** | common traffic advisory frequency |
| **DA** | decision altitude |
| **dB** | decibel |

| | |
|---|---|
| **DBE** | disadvantaged business enterprise |
| **DEL** | delete |
| **DEP** | depart, departure |
| **DIS** | distance |
| **DME** | distance measuring equipment |
| **DNL** | day-night average sound level |
| **DOT** | department of transportation |
| **DR** | low drifting (followed by DU SA or SN) |
| **DS** | dust storm (meteo) |
| **DSPLCD** | displaced |
| **DTG** | distance-to-go |
| **DU** | dust (meteo) |
| **DUATS** | Direct User Access Terminal Service |
| **DW** | dual wheels |
| **DZ** | drizzle |
| **EA** | environmental assessment |
| **EAA** | Experimental Aircraft Association |
| **EAS** | Essential Air Service |
| **EDDA** | environmental due diligence audit |
| **EFAS** | En Route Flight Advisory Service |
| **EIS** | environmental impact statement |
| **ELT** | emergency locator transmitter |
| **EMAS** | engineered materials arresting system |
| **EMMP** | equipment maintenance management program |
| **END** | stop-end (related to runway visual range) |
| **EPA** | Environmental Protection Agency |
| **EST** | estimated |
| **ETA** | estimated time of arrival/estimating arrival |
| **ETD** | estimated time of departure |
| **ETE** | estimated time of entry |
| **FAA** | Federal Aviation Administration |
| **FAR** | Federal Aviation Regulations |
| **FBO** | fixed-base operator |
| **FCC** | Federal Communications Commission |
| **FDR** | full-depth reclamation |
| **FEMA** | Federal Emergency Management Agency |
| **FG** | fog (meteo) |
| **FICON** | field condition |
| **FIDS** | flight information display system |
| **FIMs** | facility improvement measures |
| **FLD** | field |
| **FLT** | flight |
| **FLT/PLN** | flight plan |
| **FMV** | fair market value |
| **FNS** | Federal NOTAM System |
| **FOD** | foreign object damage (debris) |
| **FONSI** | finding of no significant impact |
| **FRONT** | front (relating to weather) |
| **FRQ** | frequent |
| **FSD** | federal security director |
| **FSDO** | Flight Standards District Office |

| | |
|---|---|
| **FSL** | full stop landing |
| **FSS** | flight service station |
| **FU** | smoke (meteo) |
| **FZ** | freezing (meteo) |
| **FZDZ** | freezing drizzle |
| **FZFG** | freezing fog |
| **FZRA** | freezing rain |
| **G** | gusts (meteo) |
| **G/G** | ground/ground |
| **GA** | general aviation |
| **GAMA** | General Aviation Manufacturers Association |
| **GHG** | greenhouse gases |
| **GIS** | Geographic Information System |
| **GMT** | Greenwich Mean Time |
| **GND** | ground level |
| **GOVT** | government |
| **GP** | glide path |
| **GPS** | global positioning system |
| **GPU** | ground power unit |
| **GQS** | glide path qualification surface (now vertical guidance surface) |
| **GR** | hail > 5 mm (meteo) |
| **GRASS** | grass landing area |
| **GRVL** | gravel |
| **GS** | glide slope indicator |
| **GS** | small hail or snow pellets (meteo) |
| **GW** | gross weight |
| **HDG** | heading |
| **HIRL** | high-intensity runway lights |
| **HURCN** | hurricane |
| **HVY** | heavy |
| **IAAE** | International Association of Airport Executives |
| **IC** | ice crystals (meteo) (very small; also known as diamond dust) |
| **ICAA** | International Civil Airports Association |
| **ICAO** | International Civil Aviation Organization |
| **IFE** | independent fee estimate |
| **IFR** | instrument flight rules |
| **ILS** | instrument landing system |
| **IM** | inner marker |
| **INOP** | inoperative |
| **INSTR** | instrument |
| **INTST** | intensity |
| **IROPS** | irregular operations |
| **IATA** | International Air Transport Association |
| **ITP** | into plane |
| **KPI** | key performance indicator |
| **LAA** | local airport advisory |
| **LAAS** | local area augmentation system |
| **LAHSO** | land and hold short operations |
| **LCTD** | located |
| **LDA** | landing distance available |
| **LDI** | landing direction indicator |

| | |
|---|---|
| **LED** | light-emitting diode |
| **LEED®** | Leadership in Energy and Environmental Design |
| **LF** | low frequency |
| **LGT** | light or lighting |
| **LGTD** | lighted |
| **LIH** | light intensity high |
| **LIL** | light intensity low |
| **LIM** | light intensity medium |
| **LLWAS** | low-level windshear alert system |
| **LNAV** | lateral navigation (for GPS approaches) |
| **LOA** | letter of agreement |
| **LOC** | localizer (part of an ILS system) |
| **LPV** | localizer performance with vertical guidance (for GPS approaches) |
| **LSA** | light sport aircraft |
| **LVL** | level |
| **LVP** | low-visibility procedure |
| **LYR** | layer or layered |
| **MAG** | magnetic |
| **MAGVAR** | magnetic variation |
| **MAINT** | maintenance |
| **MALS** | medium-intensity approach lighting system |
| **MALSF** | medium-intensity approach lighting system with sequenced flashers |
| **MALSR** | medium-intensity approach lighting system with runway alignment indicator lights |
| **MAP** | missed approach point |
| **MAP** | military airport program |
| **Mb** | millibars |
| **MDA** | minimum descent altitude |
| **MET** | meteorological (office) |
| **MET** | meteorological or request METAR |
| **METAR** | meteorological aviation routine weather report/actual report |
| **MHVDF** | medium, high and very high frequency direction-finding station (at the same location) |
| **MHz** | megahertz |
| **MID** | midpoint (related to runway visual range) |
| **MIL** | military |
| **MIN** | minimum |
| **Min** | minutes |
| **MIRL** | medium-intensity runway light |
| **MLS** | microwave landing system |
| **MM** | middle marker |
| **MN** | magnetic north |
| **MOA** | memorandum of agreement |
| **MOA** | military operations area |
| **MOD** | moderate (used to indicate the intensity of weather phenomena, interference or static reports, e.g., MOD RA = moderate rain) |
| **MOGAS** | motor gasoline |
| **MOS** | minimum operating strip |
| **MOS** | modification to standards |
| **MOU** | memorandum of understanding |
| **MPH** | statute miles per hour |

| | |
|---|---|
| **MPO** | metropolitan planning organization |
| **MSL** | mean sea level |
| **MTOW** | maximum takeoff weight |
| **MUNI** | municipal |
| **MVAR** | magnetic variation |
| **NAAQS** | National Ambient Air Quality Standards |
| **NAS** | National Airspace System |
| **NASA** | National Aeronautics and Space Administration (U.S.) |
| **NASAO** | National Association of State Aviation Officials |
| **NAS-Plan** | National Airspace System Plan |
| **NATA** | National Air Transportation Association |
| **NAV** | navigation |
| **NAVAID** | navigational aid |
| **NBAA** | National Business Aviation Association |
| **NDB** | nondirectional beacon |
| **NEPA** | National Environmental Policy Act |
| **NextGen** | Next Generation Air Transportation System |
| **NFPA** | National Fire Protection Association |
| **NIMS** | National Incident Management System |
| **NM** | nautical mile (= 1.1508 statute miles) |
| **NOAA** | National Oceanic and Atmospheric Administration |
| **NONSTD** | nonstandard |
| **NOSIG** | no significant change (used in trend-type landing forecasts) |
| **NOTAM** | Notice to Airmen |
| **NOTAMC** | NOTAM cancelling another NOTAM |
| **NOTAMN** | new NOTAM |
| **NOTAMR** | NOTAM replacing another NOTAM |
| **NPA** | nonprecision approach |
| **NPDES** | National Pollutant Discharge Elimination System |
| **NPE** | nonprimary entitlement |
| **NPIAS** | National Plan of Integrated Airport Systems |
| **NPRM** | notice of proposed rulemaking (FAA) |
| **NTAP** | Notice to Airmen publication |
| **NTSB** | National Transportation Safety Board (U.S.) |
| **NWS** | National Weather Service |
| **OBSC** | obscured, obscure or obscuring |
| **OBST** | obstacle, obstruction |
| **OBSTL** | obstruction lights |
| **OCS** | obstacle clearance surface |
| **OE/AAA** | Obstruction Evaluation/Airport Airspace Analysis |
| **OFA** | object-free area |
| **OFZ** | obstacle-free zone |
| **OJT** | on-the-job training |
| **OPLAN** | operational plan |
| **OPS** | operations |
| **OTS** | out of service |
| **OVC** | overcast (meteo) |
| **OVR** | over |
| **PA** | precision approach |
| **PAPI** | precision approach path indicator |
| **PAT** | pattern |

| | |
|---|---|
| **PAX** | passengers |
| **PBN** | performance-based navigation |
| **PCI** | pavement condition index |
| **PCL** | pilot-controlled lighting |
| **PE** | ice pellets |
| **PFC** | passenger facility charge |
| **PIREP** | pilot weather report (ICAO) |
| **PNR** | prior notice required |
| **PPR** | prior permission required |
| **PRKG** | parking |
| **PRL** | pilot request, level (service) |
| **PRM** | precision runway monitor |
| **PROP** | propeller |
| **R** | right (runway identification) |
| **RADAR** | radio detecting and ranging |
| **RAG** | runway arresting gear |
| **RAI** | runway alignment indicator |
| **RAIL** | runway alignment indicator lights |
| **RAPCON** | radar approach control facility |
| **RCAM** | runway condition assessments matrix |
| **RCL** | runway center line |
| **RCLL** | runway center line lights |
| **RCMT** | regulation compliance management tool |
| **RCR** | runway condition reading |
| **RDC** | runway design code |
| **REDL** | runway edge light(s) |
| **REIL** | runway end identifier lights |
| **RENL** | runway end light(s) |
| **RESA** | runway end safety area (ICAO) |
| **RF** | radio frequency |
| **RFF** | rescue and firefighting |
| **RFI** | request for information |
| **RFQ** | request for qualifications |
| **RL** | runway lights |
| **RMK** | remark(s) |
| **RNAV** | area navigation (generic acronym for any device capable of aircraft guidance between pilot-defined waypoints) |
| **RNP** | required navigation performance |
| **ROD** | record of decision |
| **RPZ** | runway protection zone |
| **RQRD** | required |
| **RSA** | runway safety area |
| **RTE** | route |
| **RTHL** | runway threshold light(s) |
| **RTN** | return or returned or returning |
| **RTO** | reduced takeoff and landing |
| **RTS** | return to service |
| **RVR** | runway visual range |
| **RVRM** | runway visual range midpoint |
| **RVRR** | runway visual range rollout |
| **RVRT** | runway visual range touchdown |

| | |
|---|---|
| **RW** | runway |
| **RWEWP** | runway end waypoint |
| **RWIWP** | runway intercept waypoint |
| **RWY WP** | runway waypoint |
| **RWY** | runway |
| **SA** | sand (meteo) |
| **SASO** | specialized aviation service operation |
| **SCASDP** | Small Community Air Service Development Program |
| **SG** | snow grains (meteo) |
| **SGHAT** | Solar Glare Hazard Analysis Tool |
| **SICP** | snow and ice control plan |
| **SID** | standard instrument departure (route) |
| **SIDA** | secure identification display area |
| **SIGMET** | significant meteorological information (broadcast warnings of weather hazards) |
| **SIGWX** | significant weather |
| **SIR** | packed or compacted snow and ice on runway(s) |
| **SMGC** | surface movement guidance and control |
| **SMO** | FAA system management office |
| **SMS** | safety management system |
| **SN** | snow (meteo) |
| **SNOWTAM** | A special series NOTAM noting the presence or removal of hazardous conditions due to snow, ice, slush or standing water associated with snow, slush and ice on the movement area, by means of a specific pro forma |
| **SOP** | standard operating procedures |
| **SOQ** | statement of qualifications |
| **SPCC** | spill prevention, control and countermeasure plan |
| **SRA** | safety risk assessment |
| **SRE** | snow removal equipment |
| **SRM** | safety risk management |
| **SS** | sand storm (meteo) |
| **SSI** | sensitive security information |
| **STA** | sequence/scheduled time of arrival |
| **STA** | straight-in approach |
| **STAR** | standard terminal arrival route |
| **STD** | scheduled time of departure |
| **STD** | standard (altimeter setting) |
| **STN** | station |
| **STOL** | short takeoff and landing |
| **SUA** | special-use airspace |
| **sUAV** | small unmanned aerial vehicle |
| **SVC** | service (message) |
| **SVCBL** | serviceable |
| **SVFR** | special VFR |
| **SWOT** | strengths, weaknesses, opportunities and threats |
| **SWPPP** | stormwater pollution prevention plan |
| **SWY** | stopway (ICAO) |
| **T** | temperature |
| **T/O** | takeoff |
| **TA** | traffic advisory (ACAS/TCAS) |

| | |
|---|---|
| **TACAN** | UHF tactical air navigation aid (azimuth and DME) |
| **TALPA** | takeoff and landing performance assessment |
| **TAS** | traffic advisory system |
| **TBA** | to be advised |
| **TBD** | to be determined (defined) |
| **TBL** | triple bottom line |
| **TCAS** | traffic (alert and) collision avoidance system |
| **TCH** | threshold crossing height |
| **TDG** | taxiway design group |
| **TDR** | transfer of development rights |
| **TDZ LGT** | touchdown zone lights |
| **TDZ** | touchdown zone |
| **TDZL** | touchdown zone lights |
| **TEMP** | temperature |
| **TERPS** | U.S. terminal instrument procedures |
| **TFMSC** | traffic flow management system counts |
| **TFR** | temporary flight restriction |
| **TGL** | touch-and-go landing |
| **THDG** | true heading |
| **TIP** | transportation improvement program |
| **TLOF** | touchdown and lift-off area |
| **TN** | true north |
| **TO** | takeoff |
| **TODA** | takeoff distance available |
| **TORA** | takeoff run available |
| **TRB** | Transportation Research Board |
| **TRSA** | terminal radar service area |
| **TSA** | taxiway safety area |
| **TSA** | Transportation Security Administration |
| **TSR** | transportation security regulation |
| **TW** | taxiway |
| **TWS** | Terminal Weather Service (ICAO) |
| **TWY** | taxiway |
| **TWYL** | taxiway lights |
| **UAS** | unmanned aircraft system |
| **UAV** | unmanned aerial vehicle |
| **UFA** | user-fee airports |
| **UFN** | until further notice |
| **UFO** | unidentified flying object |
| **UGM** | urban growth management |
| **UHF** | ultra high frequency |
| **UNAVBL** | unavailable |
| **UNL** | unlimited |
| **UNLGT** | unlighted |
| **UNMKD** | unmarked |
| **UNMNT** | unmonitored |
| **U.S.C.** | United States Code |
| **USDA** | U.S. Department of Agriculture |
| **USFWS** | U.S. Fish and Wildlife Service |
| **UTC** | Universal Time Coordinates |
| **VALE** | Voluntary Airport Low Emissions Program |

| | |
|---|---|
| **VASI** | visual approach slope indicator |
| **VDP** | visual descent point |
| **VFR** | visual flight rules |
| **VGS** | vertical guidance surface (formerly glide path qualification surface) |
| **VHF** | very high frequency |
| **VIS** | visibility |
| **VLJ** | very light jet |
| **VNAV** | vertical navigation (for GPS approaches) |
| **VOL** | volume |
| **VOR** | VHF omnidirectional range |
| **VOR-DME** | VHF omnidirectional range/distance measurement equipment |
| **VORTAC, VOR/TAC or VOR-TACAN** | combined VOR and TACAN |
| **VSB** | visibility |
| **VTOL** | vertical takeoff and landing |
| **WAAS** | wide area augmentation system |
| **WAC** | world aeronautical chart |
| **WAFS** | World Area Forecast System |
| **WHA** | wildlife hazard assessment |
| **WHMP** | wildlife hazard management plan |
| **WHSV** | wildlife hazard site visit |
| **WHWG** | wildlife hazard working group |
| **WILCO** | will comply |
| **WINDMG** | wind magnitude |
| **WINDR** | wind direction |
| **WKN** | weaken or weakening |
| **WND** | wind |
| **WPT** | waypoint |
| **WQC** | water quality certificate |
| **WRNG** | warning |
| **WS** | wind shear |
| **WSPD** | wind speed |
| **WSR** | wet snow on runway(s) |
| **WT** | weight |
| **WTR** | water on runway(s) |
| **WTWS** | wind shear and turbulence warning system |
| **WWW** | World Wide Web (Internet) |
| **WX** | weather |
| **X-BAND** | frequency range between 8,000 and 12,500 MHz |
| **XFSS** | auxiliary flight service station |
| **XMIT** | transmit |
| **X-Wind** | crosswind |
| **XX** | heavy (used to qualify weather such as rain; e.g., heavy rain = XX RA) |
| **Z** | Zulu time (Greenwich Mean Time) |

# Glossary

## #

**49 Code of Federal Regulations (CFR) Part 1500**: Refers to applicability, terms and abbreviations.

**49 Code of Federal Regulations (CFR) Part 1503**: Refers to investigative and enforcement procedures.

**49 Code of Federal Regulations (CFR) Part 1520**: Refers to protection of sensitive security information.

**49 Code of Federal Regulations (CFR) Part 1540**: Refers to general rules.

**49 Code of Federal Regulations (CFR) Part 1542**: Refers to airport security.

**49 Code of Federal Regulations (CFR) Part 1544**: Refer to aircraft operator security.

**49 Code of Federal Regulations (CFR) Part 1546**: Refers to foreign air carrier security.

**49 Code of Federal Regulations (CFR) Part 1548**: Refers to indirect air carrier security.

**49 Code of Federal Regulations (CFR) Part 1550**: Refers to aircraft security under general operating and flight rules (12,500 Rule).

**49 Code of Federal Regulations (CFR) Part 1552**: Refers to flight schools.

**49 Code of Federal Regulations (CFR) Part 1562**: Refers to operations in the Washington, D.C., metropolitan area.

## A

**above ground level (AGL)**: Altitude expressed as feet above terrain or airport elevation (see mean sea level).

**accelerate-stop distance available (ASDA)**: The runway plus stopway length declared available and suitable for the acceleration and deceleration of an aircraft aborting a takeoff.

**acceptable minimum level of service**: Minimum acceptable pavement condition index rating for a category of pavement, such as a general aviation runway.

**accrual-based accounting**: Under the accrual basis, revenues and expenses are recorded when they are earned, regardless of when the payment is issued.

**ACRP Legal Research Digests**: Research on topics of special interest to the airport legal community.

**ACRP Research Reports**: Reports developed from a research process and may be accompanied by associated tools.

**ACRP Syntheses of Practice**: Reports on current knowledge and practice in a compact format, without the detailed direction usually found in handbooks or design manuals.

**action plan**: Describes the actions intended to achieve the stated goals and objectives.

**advisory circular**: A series of external, informational FAA publications consisting of non-regulatory material about a policy and providing guidance for compliance.

**aeronautical activity**: Any activity that involves, makes possible or is required for the operation of aircraft or that contributes to or is required for the safety of such operations.

**aeronautical chart**: A representation of a portion of the earth, its culture and relief, specifically designated to meet the requirements of air navigation.

**Aeronautical Information Manual (AIM)**: A primary FAA publication with the purpose of instructing airmen about operating in the National Airspace System of the United States. It provides basic flight information, air traffic control procedures and general instructional information concerning health, medical facts, factors affecting flight safety, accident and hazard reporting and types of aeronautical charts and their use.

**aeronautical revenue**: Revenue generated from core aeronautical activities, defined as those activities that take place on the airfield or in non-passenger-dependent activities around the terminal.

**air carrier**: A legal entity that undertakes directly by lease or other arrangements to provide air transportation.

**air carrier, certificated route**: An air carrier holding a Certificate of Public Convenience and Necessity, issued by the U.S. Department of Transportation under Part 121 of the Federal Aviation Regulations, to conduct scheduled services over specified routes and a small number of nonscheduled operations.

**air carrier, commuter**: An air taxi operator that, under FAR Part 135, (1) performs at least five round trips per week between two or more points and publishes flight schedules that specify the times, days of the week and places between which such flights are performed or (2) transports mail by air pursuant to a contract with the U.S. Postal Service.

**aircraft accident**: An occurrence associated with the operation of an aircraft that takes place between the time any person boards the aircraft with the intention of flight until such time as all such persons have disembarked, and in which any person suffers death or serious injury as a result of being in or upon the aircraft or by direct contact with the aircraft or anything attached thereto or in which the aircraft receives substantial damage.

**aircraft approach category (AAC)**: A lettering system used by the FAA to group aircraft based on approach speed.

**aircraft classes**: For the purposes of wake turbulence separation minima, air traffic control classifies aircraft as heavy, large and small as follows:

- *heavy* – Aircraft capable of takeoff weights of 300,000 pounds or more, whether or not they are operating at this weight during a particular phase of flight.
- *large* – Aircraft of more than 12,500 pounds maximum certificated takeoff weight, up to 300,000 pounds.
- *small* – Aircraft of 12,500 pounds or less maximum certificated takeoff weight.

**aircraft classification number**: A number that expresses the relative effect of an aircraft at a given configuration on a pavement strut for a specified subgrade.

**aircraft incident**: An occurrence that meets the criteria for an aircraft accident, except there was no intention of flight.

**aircraft operations area or air operations area (AOA)**: Any area of the airport used or intended to be used for the landing, takeoff or surface maneuvering of aircraft, including runways, taxiways and, in some cases, ramp areas.

**Aircraft Owners and Pilots Association (AOPA)**: A trade association that represents aircraft owners and pilots; its mission is to effectively serve the interests and needs of its members as aircraft owners and pilots and establish, maintain and articulate positions of leadership to promote the economy, safety, utility and popularity of flights in general aviation aircraft.

**aircraft parking line limit (APL)**: A line established by the airport authorities beyond which no part of a parked aircraft should protrude.

**aircraft rescue and firefighting (ARFF)**: A special category of firefighting that involves the response, hazard mitigation, evacuation and rescue of passengers and crew of an aircraft involved in an airport ground emergency.

**airfield capacity**: The maximum number of aircraft operations (landings or takeoffs) that can take place on an airfield in 1 hour under specific conditions.

**airline transport pilot (ATP)**: The most advanced of all pilot certificates, requiring the highest skill and experience levels. Requires a minimum of 1,500 hours flight experience, ATP written exam and flight test. Mandatory for captains of FAR Part 121 major scheduled airlines, regional carriers, Part 125 scheduled commuter airlines and some FAR Part 135 operations. A hiring requirement for many pilot positions in corporate and commercial general aviation flying.

**airline use agreement**: A contract between the airport operator and its tenant airlines that establishes the rights, privileges and obligations for each party and defines how the airport is to be used by the airlines.

**airplane design group (ADG)**: A classification of aircraft by the FAA based on wingspan and tail height.

**airport**: An area of land or water that is used or intended to be used for the landing and taking off of aircraft, including its buildings and facilities, if any.

**airport asset management plan**: A plan describing the activities and investments in infrastructure and assets required to achieve and maintain service outcome standards in the short and long term, according to the airport's master plan or strategic plan for servicing customers, the community and other stakeholders.

**Airports Capital Improvement Plan (ACIP)**: A document prepared by the airport sponsor on an annual basis that represents the airport sponsor's 5-year program for capital development at the airport. Also referred to as a capital improvement program or transportation improvement program.

**airport catchment area**: The area surrounding the airport from which it attracts passengers. Most often influenced by the proximity of competing airports.

**airport certification manual (ACM)**: A document that details how the airport operator will comply with the requirements of FAR Part 139: Certification of Airports.

**airport customer experience**: The net impression of all experiences a customer has in an airport, as judged by customers based on their individual standards, expectations and perceptions.

**airport director or airport manager**: The person responsible for the day-to-day operation of an airport, including the business, administrative, operational and communication aspects and the implementation of policy guidance and longer-term plans for the airport.

**airport economic impact**: The contribution of an airport to the regional economy, quantified in terms of employment, payroll and output.

**airport elevation**: The highest point of an airport's usable runways, measured in feet above mean sea level.

**airport hazard**: Any structure or natural object located on or in the vicinity of a public airport, or any use of land near such airport, that obstructs the airspace required for the flight of aircraft landing, taking off or taxiing at the airport.

**Airport Improvement Program (AIP)**: A program that provides financial grants to primarily public agencies for the planning and development of public-use airports that are included in the National Plan of Integrated Airport Systems.

**airport influence area**: An area adjacent to an airport that can affect or be affected by airports and aircraft operations that necessitate restrictions on those land uses.

**airport joint-use agreement**: An agreement between a military unit and a civilian airport that delineates responsibility and outlines payment arrangements.

**airport layout plan (ALP)**: A set of drawings that provide a graphic representation of the sponsor's long-term development plan for an airport, including property boundaries, existing and proposed airport facilities and structures and the location of existing and proposed nonaeronautical areas.

**airport master plan (AMP)**: An assembly of appropriate documents and drawings covering the development of a specific airport from a physical, economic, social and political jurisdictional perspective by assessing current and projected demands. The master plan typically has a time frame of 20 years, with short-, intermediate- and long-term goals within that time frame. The airport layout plan is a part of this plan.

**airport noise-compatibility planning study**: A study designed to increase the compatibility of land and facilities in the areas surrounding an airport that are most directly affected by the operation of the airport. The specific purpose is to reduce the adverse effects of noise as much as possible by implementing on-airport noise control measures and off-airport land-use control programs. Under FAR Part 150, local jurisdictions can prepare and submit to the FAA a noise-exposure map for the airport's environs and a noise-compatibility plan.

**airport operating certificate (AOC)**: A certificate issued under FAR Part 139 for the operation of a Class I, II, III or IV airport.

**airport operator**: The public or private operator or sponsor of a public-use airport.

**airport property**: Any property described as part of an airport in an agreement with the United States or defined by an airport layout plan or listed in an Exhibit "A" property map is considered to be obligated property for airport purposes.

**airport reference code (ARC)**: An airport designation by the FAA that signifies the airport's highest runway design code, minus the third (visibility) component of the runway design code. The ARC is used for planning and design only and does not limit the aircraft that may be able to operate safely on the airport.

**airport reference point (ARP)**: The approximate geometric center of all usable runways at the airport.

**airport revenue**: All fees, charges, rents or other payments received by the sponsor for use of the airport property and services; sale, transfer or disposition of airport real property; sale or lease of sponsor-owned mineral, natural or agricultural products or water taken from the airport; revenue from sponsor activities on the airport; and state or local aviation fuel taxes, except taxes in effect on December 30, 1987.

**airport security coordinator (ASC)**: An airport operator's designated primary and immediate contact for security-related activities and communication with the Transportation Security Administration.

**airport sponsor**: Typically a public agency or tax-supported organization that is authorized to own and operate an airport, obtain funds and property interests and be legally, financially and otherwise able to meet all applicable requirements of laws and regulations. Occasionally, it is a private entity.

**airport surveillance radar (ASR)**: Approach control radar used to detect and display an aircraft's position in the terminal area. ASR provides range and azimuth information but does not provide elevation data. Coverage of the ASR can extend up to 60 miles.

**airport survey**: The collection of data for the analysis of some aspects of the airport or airport operations.

**airport system plan**: Identification of general location and characteristics of airports within that system, such as a state or region, to meet the air transportation goals of the system under study.

**airport traffic control tower (ATCT)**: A raised facility on the airfield from which controllers visually, and by radar where available, monitor air traffic and use two-way radios on a designated frequency to direct traffic.

**airport user fee**: A tax levied on passengers for passing through an airport. The tax is generally paid for use of the airport and is one of a number of taxes that are typically included in the price of an airline ticket.

**Airports Geographic Information System (Airports GIS)**: The FAA's system of collecting and compiling airport and aeronautical data.

**air route traffic control center (ARTCC)**: An FAA facility established to provide air traffic control to aircraft operating on an instrument flight rule flight plan within controlled airspace, principally during the en route phase of flight.

**air service development (ASD)**: The practice of retaining and/or establishing air service to a given airport or community.

**airspace hazard**: An airspace obstruction that has been studied and determined to have a substantial adverse effect, affecting a significant volume of aeronautical activity.

**airspace obstruction**: An object, structure or element of terrain that exceeds federal obstruction standards, as defined in FAR Part 77.

**air taxi**: Operations performed by operators of aircraft holding an air taxi certificate under Part 135 of the Federal Aviation Regulations. This category includes commuter airline operations (excluding certificated commuter airlines), mail carriers under contract with the U.S. Postal Service and operators of nonscheduled air taxi services. Typically, air taxis do not utilize aircraft with a payload capacity over 7,500 pounds or capable of carrying more than 30 passengers.

**air traffic control (ATC)**: The FAA service providing separation services to participating airborne traffic and clearances to land, take off or taxi at airports with a control tower.

**airways**: Corridors of sky usually linking very high frequency omnidirectional ranges or nondirectional radio homing beacons. Aircraft using airways are protected by internationally agreed-upon rules of separation.

**aligned taxiway**: A taxiway with its centerline aligned with a runway centerline. Sometimes referred to as an "inline taxiway."

**alteration**: A change to a facility, including but not limited to, remodeling, renovation, rehabilitation, reconstruction, historic restoration, changes or rearrangement in structural parts and elements.

**altimeter**: A highly sensitive barometer that shows an aircraft's altitude above mean sea level by measuring atmospheric pressure.

**altimeter setting**: A value related to local barometric pressure, usually provided to pilots by air traffic control. Used as a reference setting so that the aircraft altimeter indicates an accurate altitude. Above 18,000 feet, all pilots use a standard setting of 29.92 inches of mercury.

**Americans with Disabilities Act of 1990 (ADA)**: Regulates accessibility by persons with disabilities in airport terminals, at curbs, on roadways and on surface transportation.

**approach (departure) control**: Radar-based air traffic control that provides traffic separation services outside the local immediate airport area to a distance of about 40 miles.

**approach lights**: A lighting system located off the end of the runway to aid the pilot in identifying the runway environment.

**approach or departure airspace**: The airspace, within 5 statute miles of an airport, through which aircraft move during landing or take off.

**approach procedure with vertical guidance (APV)**: An instrument approach procedure providing vertical and lateral electronic guidance.

**approach reference code (APRC)**: A code signifying the current operational capabilities of a runway and associated parallel taxiway with regard to landing operations.

**approach surface**: A surface longitudinally centered on the extended runway centerline and extending outward and upward from each end of the primary surface. An approach surface is applied to each end of each runway based on the type of approach available or planned for that runway end.

**apron/ramp**: A defined area on an airport or heliport intended to accommodate aircraft for purposes of loading passengers or cargo, refueling, parking or maintenance.

**aqueous film-forming foam (AFFF)**: A firefighting agent that is used to coat the burning material, cooling it and preventing its contact with oxygen to suppress the fire.

**area navigation (RNAV)**: A method of navigation that allows an aircraft to choose any course within a network of navigation beacons, rather than navigating directly to and from the beacons. It includes lateral navigation providing horizontal alignment guidance to the pilot and can include lateral navigation or vertical navigation providing horizontal and vertical guidance to a pilot.

**attainment/nonattainment**: An area that has monitored air pollutant concentrations below the established National Ambient Air Quality Standards is considered "attainment." An area with concentrations above the National Ambient Air Quality Standards is considered "nonattainment."

**automatic terminal information service (ATIS)**: A continuous broadcast on a separate air traffic control frequency of an airport's current weather (updated at least hourly). Eliminates controller requirement to read local weather data to each landing or departing aircraft.

**Automated Weather Observing System (AWOS)/Automated Surface Observing System (ASOS)**: A system of weather sensors that collect and disseminate weather data to pilots and flight dispatchers so they may prepare for and monitor weather forecasts. The ASOS program is entirely federally funded, whereas AWOSs are generally funded by the operator or airport sponsor.

**automatic dependent surveillance – broadcast (ADS-B)**: A technological application for pilots and air traffic controllers that uses global positioning system satellites to determine aircraft location, ground speed and other data, and provides traffic and weather information directly to the cockpits of properly equipped aircraft. ADS-B out equipment allows the aircraft to transmit its position. ADS-B in and out allows the aircraft to transmit its position and receive weather data and flight information services.

**automatic direction finding (ADF)**: A basic guidance mode providing aircraft with lateral guidance to an aviation radio station. ADF equipment provides the pilot with a directional bearing to an aviation radio station that is relative to the user's current location.

**auxiliary aids**: Qualified interpreters, note takers, transcription services, writing materials, telephone headset amplifiers, assistive listening devices, assisted listening systems, telephones compatible with hearing aids, closed- and open-caption decoders, text telephones (telephone devices such as TTYs), videotext displays or other aural delivery devices; qualified readers, taped text audio recordings, Braille materials, large-print materials or other materials for visual delivery.

**avgas**: Aviation gasoline used by piston-powered aircraft.

**avigation easement**: A type of acquisition of an interest in land or property that involves less than fee simple purchase. One form of avigation easement grants an airport the right to perform aircraft operations over the designated property, including operations that might cause noise, vibration and other effects. A stronger form of easement is a deed restriction that may include the right to perform aircraft operations on the property or the public acquisition of a landowner's rights, restricting future development of the property for any use more intensive than that existing at the time of the transaction. This easement may also include prohibitions on the uses for which the property may be developed. The maximum heights of structures and other objects may also be specified.

## B

**baggage sort system**: Baggage tag readers and baggage conveyer switching or sorting equipment used to read baggage tags and divert bags to their intended destinations.

**base or base leg**: The leg perpendicular to the final leg of the traffic pattern to the landing runway.

**based aircraft**: Aircraft stationed at an airport on a long-term or permanent basis, usually by some form of agreement between the aircraft owner and airport management.

**base rent**: A set amount, used as a minimum rent in a lease, with provisions for increasing the rent over the term of the lease.

**benchmark study**: The practice of comparing key metrics for the airport and airport operations to other similar or competitive airports.

**benefit–cost analysis**: A systematic approach to estimating the strengths and weaknesses of alternatives by determining options that provide the best approach to achieve benefits while preserving savings.

**benefit–cost ratio**: A calculation, determined by the FAA, of the cost of the service provided compared to the benefit of that service.

**biometric identification/security**: A mechanism utilized to identify and verify persons for security purposes. The most common type of biometrics is fingerprint scanners.

**blast fence**: A barrier used to divert or dissipate jet or propeller blast.

**blast pad**: A surface adjacent to the ends of runways provided to reduce the erosive effect of jet blast and propeller wash.

**bond**: A debt investment in which an investor loans money to an entity that borrows the funds for a defined period of time at a specified interest rate. Common forms used by government entities to borrow money to finance a project include general obligation and revenue bonds.

**brand**: An airport's identity that differentiates it from its competition.

**branding**: The process of creating a unique, positive and recognizable identity for an airport that attracts and retains customers.

**budget**: An estimate of income and expenditure for a set period of time.

**building restriction line (BRL)**: A line established with respect to the runway centerline to assure that structures will not project above the imaginary surfaces required by Federal Aviation Regulations Part 77, and obstruction clearance criteria.

**business aviation**: The sector of general aviation (as defined by the International Civil Aviation Organization) that concerns the operation of aircraft by companies for carrying passengers or goods as an aid to conducting their business, flown for purposes generally considered not for public hire and piloted by individuals having, at the minimum, a valid commercial pilot license with an instrument rating.

**business plan**: A written plan defining how the airport will operate on a day-to-day basis to achieve established goals and objectives. A business plan translates longer-term goals into action plans. A business plan focuses on the short term.

**bypass taxiway**: A taxiway used to reduce aircraft wait time by providing multiple takeoff points.

## C

**capital improvement plan (CIP)**: A document prepared by the airport sponsor on an annual basis that represents the airport sponsor's five-year program for capital development at the airport.

**capital investment**: Expending capital to make improvements to an airport.

**cash accounting**: The cash method accounts for revenue only when the money is received and for expenses only when the payment is made.

**categorical exclusion (CATEX)**: A category of actions that do not individually or cumulatively have a significant effect on the human environment and for which neither an environmental assessment nor an environmental impact statement is required. (Documentation in the form of a CATEX checklist still must be prepared by the airport or its sponsor.)

**center**: One of 24 FAA air route traffic control centers providing radar surveillance and traffic separation to participating en route traffic above and outside airspace handled by approach and departure control.

**certificate of authorization**: FAA authorization to operate an unmanned aircraft system for other-than-recreational purposes in the United States, limited to public unmanned aircraft system operations.

**certificated flight instructor (CFI)**: A pilot holding a commercial pilot certificate who, after passing two written tests and a practical flight exam, is FAA rated to give flight instruction. The flight instructor rating is specific as to type of instruction authorized, e.g., single-engine airplane, multiengine airplane, instrument flying (CFII) or helicopter.

**charges**: A price paid for services rendered, such as fuel delivery.

**chart supplement (formerly airport/facility directory)**: FAA publication containing data on public- and joint-use airports, seaplane bases and heliports.

**circling approach***:* A maneuver initiated by the pilot to align the aircraft with a runway for landing when a straight-in landing from an instrument approach is not possible or not desirable.

**Class A airspace**: Airspace between 18,000 and 60,000 feet mean sea level over the conterminous United States. Instrument flight rule clearances are required for all aircraft operating in Class A airspace. Formerly called the "positive control area."

**Class B airspace**: Airspace area around the busiest U.S. hub airports, typically to a radius of 20 nautical miles and up to 10,000 feet above ground level. Operations within Class B airspace require an air traffic control clearance and at least a private pilot certificate (local waivers available), radio communication and an altitude-reporting (Mode C) transponder. Formerly called "terminal control area."

**Class C airspace**: Airspace area around busy U.S. airports (other than Class B). Radio contact with approach control is mandatory for all traffic. This includes an area from the surface to 1,200 feet above ground level out to 5 miles and from 1,200 to 4,000 feet AGL to 10 miles from the airport. Formerly called "airport radar service area."

**Class D airspace**: Airspace around an airport with an operating control tower, typically to a radius of 5 miles from the surface to 2,500 feet above ground level. Radio contact with the control tower required prior to entry. Formerly called "airport traffic area."

**Class E airspace**: General controlled airspace comprising control areas, transition areas, Victor airways, the continental control area, etc.

**Class F airspace**: International airspace designation not used in the United States.

**Class G airspace**: Uncontrolled airspace, generally the airspace from the surface up to 700 or 1,200 feet above ground level in most of the United States, but up to as high as 14,500 feet in some remote western and sparsely populated areas.

**clearance**: Formal instructions from air traffic control authorizing a specific route or action (e.g., climb or descend, or enter controlled airspace). Pilots may deviate from an air traffic control clearance in an emergency or when compliance would threaten the safety of a flight.

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

**climate**: The long-term pattern (i.e., expected frequency) of weather in a particular location, including the interactions between atmospheric, oceanic and land states. Climate generally refers to a larger area than weather. Climate comprises average weather conditions or patterns over a period of time for a region. Standard averaging period is 30 years.

**climate change**: A change in the state of the climate that can be identified (by using statistical tests, for example) by changes in the mean and/or the variability of its properties and that persists

for an extended period, typically decades or longer. Climate change may be due to natural internal processes or external forces, or to persistent anthropogenic changes in the composition of the atmosphere or in land use.

**cockpit to main gear distance (CMG)**: The distance in feet, from the cockpit to the main gear; used to determine the taxiway design group.

**Code of Federal Regulations (CFR)**: The codification of the general and permanent rules and regulations (sometimes called administrative law) published in the Federal Register by the executive departments and agencies of the federal government of the United States.

**commercial pilot**: Holder of an FAA commercial pilot certificate, requiring a minimum of 250 flight hours (and other subrequirements), a commercial written test and a commercial flight test. The pilot certificate to fly for compensation or hire, often in a wide variety of commercial general aviation operations including sight-seeing, aerial application, glider towing and flight instruction. It does not necessarily imply flying for a scheduled airline.

**commercial service airport**: An airport with scheduled passenger service and at least 2,500 passengers boarding per year.

**commissioning (Cx) and retro-commissioning (RCx)**: A comprehensive and systematic testing process of new (or existing, in the case of RCx) building components and systems to verify their design, installation and functionality in accordance with the client's specifications and operational demands.

**common traffic advisory frequency (CTAF)**: The radio frequency, sometimes called the UNICOM (universal communications) frequency, used by all traffic at an airport without an operating control tower to coordinate approaches, landings, takeoffs and departures. Pilots announce their positions, intentions and actions in the traffic pattern for the benefit of other traffic.

**common use**: A facility allocation and management approach intending to maximize airport facility access and allocation through nondedicated resources, a shift from the traditional tenant–landlord relationship. It comprises primarily flexible-use ticket counter and gate kiosk space.

**common-use space**: Nonexclusive areas of an airport used in common by airlines, along with other authorized users of the airport.

**common-use system**: Airport-operator-provided hardware and software systems that provide an interface through which airline proprietary systems can operate with increased facility utilization and flexibility.

**community comprehensive plan**: Generally, a formally adopted general or master plan for a community, which elaborates and codifies the community's long-range goals in the areas of land use, transportation, utilities, environmental and other areas, driven by established goals, objectives and implementing policies.

**compensatory rate methodology**: Under this methodology, an airport operator charges its airline tenants fees and rental charges in an amount necessary to recover the actual cost of operating and maintaining the facilities being leased and/or used by the airline parties.

**concurrent use**: The use of aeronautical land for a compatible nonaeronautical purpose, frequently revenue producing, while it serves the primary purpose for which it was acquired.

**conical surface**: A surface extending outward and upward from the periphery of the horizontal surface at a slope of 20 to 1 for a horizontal distance of 4,000 feet.

**construction safety and phasing plan (CSPP)**: A document that outlines procedures to maintain operational safety on an airport during construction projects. The CSPP identifies how to minimize construction impacts on operations.

**consultant**: A firm, individual, partnership, corporation or joint venture that performs architectural, engineering or planning services.

**contract tower**: An airport traffic control tower facility for which the FAA will pay the cost (some or all) of nonfederal employees and, in some instances, provide some of the operating equipment installed in the tower.

**controlled airspace**: A generic term including all airspace classes in which air traffic control services are available. Does not imply that all flight is under air traffic control. Visual flight rule aircraft may operate without air traffic control contact in most controlled airspace, as long as weather conditions will permit them to see and avoid other aircraft.

**cost per enplanement (CPE)**: The average passenger airline payments per enplaned passenger at a given airport.

**Council on Environmental Quality (CEQ)**: A division of the Executive Office of the President that coordinates federal environmental efforts in the United States and works closely with agencies and other White House offices in the development of environmental and energy policies and initiatives.

**crisis communication**: The ability to protect the reputation of the airport through a plan that provides timely and accurate information to passengers, stakeholders, the community and the media.

**crisis communication plan**: A document that helps determine how an airport will communicate to the news media, passengers, families, airport personnel and stakeholders.

**crisis management team**: A group of people trained to respond immediately to warning signals of crisis and execute relevant plans to overcome emergency situations. The team protects the airport against the adverse effects of crisis and prepares the airport for inevitable threats.

**critical aircraft**: The most demanding aircraft type or grouping of aircraft with similar characteristics that make regular use of the airport. "Regular use" is 500 annual operations, excluding touch-and-go operations. An operation is a takeoff or landing.

**customer facility charge (CFC)**: A fee paid by airport customers for the use of some nonaeronautical services at an airport, commonly collected by rental car companies to pay for their facilities.

**customer service**: The assistance and advice provided by a company to people who buy or use its products or services.

**Customs and Border Protection (CBP) Office of Field Operations**: A federal law enforcement agency responsible for regulating and facilitating international trade, collecting import duties and enforcing U.S. regulations, including trade, customs and immigration.

**cyberattack**: A deliberate attempt to violate the security of a digital system. A successful attack is one that achieves its goal, typically causing harm to information, systems or infrastructure or disrupting operations that rely on these resources.

**cybersecurity**: Means and methods that protect data and systems from unauthorized access, inappropriate modification or unintentional loss.

## 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 10 decibels to sound levels for the periods between 10 p.m. and 7 a.m.

**decision altitude (DA)**: A specified lowest height or altitude in the approach of an aircraft to a runway which, if the required visual reference to continue the approach (such as the runway markings or runway environment) is not visible to the pilot, the pilot must initiate a missed approach.

**declared distances**: The distances the airport owner declares available for aircraft's takeoff run, takeoff distance, accelerate-stop distance and landing distance requirements.

**deed restrictions**: A legal mechanism to restrict the use of a property to certain conditions in perpetuity.

**deicing**: Removing ice and snow from an aircraft. The use of liquids, chemicals and heating equipment are used in cooler climates to reduce the effects of snow and ice.

**departure obstacle clearance surface**: A 40:1 surface originating at the location and elevation of the departure end of the runway, which is used to evaluate required climb performance from a particular departure runway end to the nearest (shortest distance) obstacle in the segment.

**deplanements**: Passengers leaving an aircraft (see enplanements).

**deregulation act**: Airline Regulatory Reform Act of 1978. Designed, among other things, to encourage competition among domestic air carriers, the act allows an air carrier greater freedom to enter and leave any given market.

**design aircraft**: An aircraft with characteristics that determine the application of airport design standards for a specific runway, taxiway, taxilane, apron or other facility. This aircraft can be a specific aircraft model or a composite of several aircraft using, expected to or intended to use the airport or part of the airport. (Also called "critical aircraft" or "critical design aircraft.")

**detention ponds**: Stormwater management ponds that hold stormwater for short periods of time, generally less than 48 hours.

**direct economic impacts**: Jobs, payroll and output associated with

- The businesses at an airport that are typically related to the provision of aviation services,
- The economic benefits from spending in the local area by visitors that arrive by air, and
- The economic benefits of aviation-reliant businesses.

**Direct User Access Terminal Service (DUATS)**: A free FAA sponsored weather and flight planning service for pilots.

**disability**: With respect to an individual, a physical or mental impairment that substantially limits one or more of the major life activities; a record of such an impairment; or being regarded as having such an impairment.

**Disadvantaged Business Enterprise (DBE) Program**: A federal program developed to ensure qualified firms owned and controlled by minorities may take part in contracts supported with federal funds.

**discretionary funds**: Airport Improvement Program funds remaining within the obligation limitation, after entitlement calculation, subject to restrictions in legislation and available for distribution at the FAA's discretion, per the FAA priority system.

**displaced threshold**: A runway landing threshold located at a point other than the designated beginning of the runway (where departures would begin).

**distance measuring equipment (DME)**: Aircraft equipment that provides pilots with a readout of the distance between the DME facility (airport) and the aircraft.

**downwind leg**: A flight path parallel to the landing runway in the direction opposite the landing direction.

## E

**earned media**: Publicity gained through promotional efforts other than paid media.

**economic impacts**: Effects on the level of economic activity in a given region or in the contribution of airports to the level of economic activity in the United States. Economic impacts are shown as (1) jobs; (2) business output (essentially business sales and expenditures by public agencies); (3) labor income; and (4) value added.

**effective rent**: The actual rental rate to be achieved by the landlord after deducting the value of concessions from the base rental rate paid by a tenant, usually expressed as an average rate over the term of the lease.

**emergency locator transmitter (ELT)**: A radio transmitter automatically activated by the impact of an accident. Emits a warbling tone on the international emergency frequencies of 121.5 MHz, 243 MHz and (for newer models) 406 MHz. ELT signals can be received by nearby FAA facilities, aircraft overhead and search and rescue satellites.

**emergency management**: The process of preventing, mitigating, responding to and recovering from all types of hazards and incidents that can threaten life and property.

**emergency operations center**: A central command-and-control facility that is responsible for carrying out emergency management functions.

**emergency planning**: A formal plan outlining essential emergency-related actions to ensure the safety of and emergency services for the airport populace and the community in which the airport is located. The plan also includes provisions for including local communities and state and federal organizations, as appropriate.

**emergency response providers**: Any agency providing emergency assistance, such as airport police, local police, fire departments and paramedics.

**endangered species**: A species of animal or plant that is seriously at risk of extinction.

**energy assessment or energy audit**: An investigation of systems in existing buildings, with the goal of replacing or retrofitting equipment. This is a quick process that may include building simulation and results in a list of energy conservation measures that involve significant capital investment.

**energy management system**: An automatic system used for controlling equipment in a building. Most likely, this will be a computer-based system, including pneumatic or digital components or both.

**engineered materials arresting system (EMAS)**: A crushable material placed at the end of a runway to stop an aircraft that overruns the runway pavement.

**engine run-up area**: An area on an airport where aircraft engines are serviced or tested. The noise from such servicing or testing can affect neighborhoods adjacent to the airport.

**enplaned/deplaned passengers**: The volume of passengers outbound from an airport (enplaned) or inbound to an airport (deplaned). The annual passenger volume of an airport is the total enplaned and deplaned passengers.

**enplanements**: Passengers boarding an aircraft (see deplanements).

**En Route Flight Advisory Service (EFAS)**: A flight service station dedicated to providing real-time weather information to airborne flights (rather than for preflight planning) on a single national radio frequency of 122.0 MHz (low altitude).

**entitlement funds**: A set minimum level of Airport Improvement Program funding for an airport, based on the FAA's criteria. The minimum differs for primary and nonprimary airports based on enplanement levels for primary air carrier airports and standard allocation for each nonprimary airport.

**enterprise operating system**: Refers to standard, enterprise-wide collection of business processes used in diversified companies or public agencies. An enterprise system definition can also include in a common structure: financial/reporting, maintenance/asset management, IT backbone/communications, properties management, procurement and operational modules necessary to drive the wider organization.

**entrance taxiway**: A taxiway designed to be used by an aircraft entering a runway. Entrance taxiways may also be used to exit a runway. (See exit taxiway).

**environmental assessment (EA)**: An assessment of the environmental effects of a proposed action for which federal financial assistance is being requested or for which federal authorization is required. The EA serves as the basis for the FAA's environmental impact statement or finding of no significant impact.

**environmental due diligence audit (EDDA)**: An audit performed to identify and minimize potential environmental liabilities prior to the purchase of a property.

**environmental impact statement (EIS)**: A document prepared under the requirements of the National Environmental Policy Act of 1969, Section 102(2)(c) representing a federal agency's evaluation of the effect of a proposed action on the environment. (The FAA will serve as the sponsor of an EIS.)

**Environmental Protection Agency (EPA)**: An agency of the United States federal government; its mission is to protect human and environmental health.

**Envision**: A rating system for sustainable civil infrastructure; can be used alone or with other rating systems, such as the Leadership in Energy and Environmental Design system.

**equipment maintenance**: A broad term used to describe the various processes that are used to keep equipment in proper working order.

**equipment maintenance management program (EMMP)**: A systematic approach to keeping equipment in proper working order.

**Essential Air Service (EAS)**: A U.S. Department of Transportation program that guarantees that small communities that were served by scheduled airlines prior to deregulation will maintain a minimal level of scheduled commercial service.

**exclusive rights**: The provision of aeronautical services by a person or company other than the airport cannot be construed as exclusive by the provider.

**exclusive-use space**: An area rented to an airline for its sole use. Ticket counters, airline operational and administrative offices and airline club rooms are commonly designated as exclusive-use space.

**executive orders**: Directives from the president of the United States to officers and agencies of the executive branch that have the full force of law for management of agency operations.

**Exhibit "A" property map**: A drawing of the dedicated airport property, including detailed information about how the property was acquired, the funding source for the land and if the land was conveyed as federal surplus land or government property.

**exit taxiway**: A taxiway designed to be used by an aircraft only to exit a runway.

**Experimental Aircraft Association (EAA)**: Trade association that encourages and supports recreational aviation.

**extinct species**: An organism that has disappeared from Earth. In practice, a species not definitely located in the wildlife in the last 50 years is termed "extinct."

**extraordinary circumstances**: When an action that is normally categorically excluded may cause significant adverse environmental impacts, including consideration of special-purpose law requirements.

## F

**FAA notification**: A methodology of notifying the FAA of a certain condition or planned course of action.

**FAA order**: An internal FAA directive that sets standards, procedures and guidelines for the FAA to execute its various regulatory and grant administration mandates.

**Facebook**: A popular, free social networking website that allows registered users to create profiles, upload photographs and videos, send messages and keep in touch with friends, family and colleagues.

**fair market value (FMV)**: An estimate of the market value of a property, based on what a knowledgeable, willing and unpressured buyer would probably pay to a knowledgeable, willing and unpressured seller in the market.

**Federal Aviation Administration (FAA)**: The U.S. Department of Transportation's agency for aviation. In addition to regulating airports, aircraft manufacturing and parts certification, aircraft operation and pilot certification ("licensing"), the FAA operates air traffic control, purchases and maintains navigation equipment, certifies airports and aids airport development, among other activities.

**Federal Aviation Regulations (FAR)**: Regulations established by the FAA located in Title 14 of the Code of Federal Regulations. These regulations are the rules that govern the operation of aircraft, airways, airports and airmen.

**Federal Aviation Regulations (FAR) Part 13**: An informal airport complaint process.

**Federal Aviation Regulations (FAR) Part 16**: A formal airport compliant process.

**Federal Aviation Regulations (FAR) Part 36**: Establishes noise standards for the civil aviation fleet. Some extensions for compliance are included in the Aviation Safety and Noise Abatement Act of 1979.

**Federal Aviation Regulations (FAR) Part 77: Objects Affecting Navigable Airspace**. Establishes standards for determining obstructions in navigable airspace, outlines the requirements for notifying the FAA of certain proposed construction or alteration and provides for aeronautical studies of obstructions to air navigation in order to determine their effect on the safe and efficient use of airspace. FAR §77.25 of this part establishes imaginary surfaces around airport runways, approach zones and navigable airspace in the vicinity of the airport.

**Federal Aviation Regulations (FAR) Part 91: General Operating and Flight Rules**. Prescribes the rules governing the operation of aircraft within the United States, including the waters within 3 nautical miles of the United States coast. It also establishes the requirements for operators to take actions to support the continued airworthiness of each aircraft.

**Federal Aviation Regulations (FAR) Part 107: Small Unmanned Aircraft Systems**. Establishes the registration of airmen and the certification and operation of small (weighing less than 55 pounds) unmanned aircraft systems within the United States.

**Federal Aviation Regulations (FAR) Parts 121 and 135**: Specify certification and operational requirements for commercial operators of large aircraft and air taxis, respectively.

**Federal Aviation Regulations (FAR) Part 137: Agricultural Aircraft Operations**. Prescribes the rules governing agricultural aircraft operations within the United States and the issuance of commercial and private agricultural aircraft operator certificates for those operations.

**Federal Aviation Regulations (FAR) Part 139: Certification of Airports**. Airports that agree to meet certain operational and safety standards as prescribed in 14 CFR Part 139, also referred to as Federal Aviation Regulations (FAR) Part 139, to accommodate scheduled and unscheduled air carrier aircraft and are issued an operating certificate by the FAA. Types of Part 139 airports:

- *Class I airport*: An airport certificated to serve scheduled operations of large air carrier aircraft that can also serve unscheduled passenger operations of large air carrier aircraft and/or scheduled operations of small air carrier aircraft.
- *Class II airport*: An airport certificated to serve scheduled operations of small air carrier aircraft and the unscheduled passenger operations of large air carrier aircraft. A Class II airport cannot serve scheduled large air carrier aircraft.
- *Class III airport*: An airport certificated to serve scheduled operations of small air carrier aircraft. A Class III airport cannot serve scheduled or unscheduled large air carrier aircraft.
- *Class IV airport*: An airport certificated to serve unscheduled passenger operations of large air carrier aircraft. A Class IV airport cannot serve scheduled large or small air carrier aircraft.

**Federal Aviation Regulations (FAR) Part 150: Airport Noise-Compatibility Planning**. Applies to the airport noise-compatibility planning activities of public-use airports, including heliports. It outlines the procedures for developing and submitting airport noise-compatibility programs.

**Federal Aviation Regulations (FAR) Part 151: Federal Aid to Airports**. Provides detailed information regarding FAA airport construction and development grants. It also specifies that all airport development under the federal-aid airport program must be done in accordance with an approved airport layout plan. Each airport layout plan and any changes to the layout are subject to FAA approval.

**Federal Aviation Regulations (FAR) Part 152: Airport Aid Program**. Applies to airport planning and development under the Airport and Airway Development Act of 1970, as amended. It outlines eligibility requirements and application procedures; funding, accounting and reporting requirements; nondiscrimination in airport aid programs; suspension and termination of grants; and energy conservation programs.

**Federal Aviation Regulations (FAR) Part 156: State Block Grant Pilot Program**. Establishes the procedure by which a state may apply to participate in the state block grant pilot program, the program administration requirements, the program responsibilities for participating states and the enforcement responsibilities of participating states.

**Federal Aviation Regulations (FAR) Part 157: Notice of Construction, Alteration, Activation and Deactivation of Airports**. Defines the requirements for notifying the FAA when proposing to construct, alter, activate or deactivate a civil or joint-use (civil/military) airport or to alter the status of such an airport.

**Federal Aviation Regulations (FAR) Part 158: Passenger Facility Charges**. Applies to the passenger facility charges that may be approved by the FAA and imposed by a public agency that controls a commercial service airport.

**Federal Aviation Regulations (FAR) Part 161**: Airports may apply for approval of Stage 3 aircraft noise and access restrictions to the FAA, limiting the type of aircraft, establishing official noise abatement approach and departure procedures or limiting the hours of Stage 3 aircraft operations, subject to FAA review, approval and restrictions.

**Federal Aviation Regulations (FAR) Part 170: Establishment and Discontinuance Criteria for Air Traffic Control Services and Navigational Facilities**. Sets the federal criteria for the establishment of air traffic control services.

**federal grant assurance**: A provision of a federal grant agreement to which the recipient of federal airport development assistance has agreed to comply.

**Federal NOTAM System (FNS)**: United States digital Notices to Airmen system.

**federal security director (FSD)**: A member of the Transportation Security Administration in a leadership role responsible for security operations at federalized airports. An FSD may be responsible for an airport in a geography covering a group of airports.

**federally obligated airport**: An airport that has accepted federal grant funds and the associated requirements known as grant assurances.

**fee simple ownership**: Considered full property ownership in land wherein the owner has the exclusive right to use it, exclusively possess it, commit waste upon it, dispose of it by deed or will and take its fruits.

**field condition (FICON)**: Assessment of airfield conditions.

**final**: The last leg of the traffic pattern when the aircraft is aligned to fly straight in to the landing runway.

**final approach segment**: This is the segment of an approach procedure in which alignment and descent for landing are accomplished. The segment begins at the final approach fix and ends at the missed approach point or decision altitude, and the dimensional criteria/slope vary based on airport conditions and approach type.

**finding of no significant impact (FONSI)**: An administrative determination by the FAA that a proposed action by the airport sponsor will have no significant impact on the environment.

**fixed-base operator (FBO)**: A commercial business granted the right by the airport sponsor to operate at an airport and provide aeronautical services, such as fueling, hangaring, tie-down and parking, aircraft rental, aircraft maintenance, flight instrument, etc.

**fixed-by-function navigational aid**: An air navigational aid that must be positioned in a particular location in order to provide an essential benefit for aviation. (See navigational aid).

**flight information display system (FIDS)**: A networked system at an airport used to display real-time flight arrival and departure information.

**flight plan**: Filed by radio, telephone, computer or in person with flight service stations, a record of aircraft number, type and equipment; estimated time of departure and time en route; route and altitude to be flown; amount of fuel and number of persons aboard; home base and contact phone number; and other information.

- *visual flight rules flight plan*: Voluntary filing for cross-country flights under visual flight rules. For search and rescue use only, with no role for air traffic control.
- *instrument flight rules flight plan*: Mandatory filing (at least one-half hour) before a flight under instrument flight rules. Based on flight plan information, air traffic control can issue (immediately before departure) an instrument flight rules clearance to enter clouds or low-visibility conditions for instrument rather than visual flight.

**flight service station (FSS)**: A facility that provides information and service to aircraft pilots before, during and after flight but that is not responsible for giving instruction or clearance.

**Flight Standards District Office (FSDO)**: An FAA field office serving an assigned geographic area and staffed with flight standards personnel who serve the aviation industry and the general public on matters relating to the certification and operation of air carrier and general aviation aircraft. Activities include general surveillance of operational safety, certification of airmen and aircraft, accident prevention, investigation and enforcement.

**Flight Watch**: (See En Route Flight Advisory Service)

**force majeure**: A provision of an airport lease that addresses unavoidable causes, typically for the delay of capital projects due to acts of God and natural disasters. This clause is particularly important if the lease includes a schedule for completion of improvements by the lessee or airport sponsor.

**foreign object damage and foreign object debris (FOD)**: Foreign object debris is a substance, debris or article alien to an aircraft or aircraft system that could potentially damage the aircraft. Foreign object damage is any damage attributed to a foreign object that can be expressed in physical or economic terms and may or may not degrade the aircraft's required safety or performance characteristics.

**frangible**: An object that retains its structural integrity and stiffness up to a designated maximum load but, on impact from a greater load, breaks, distorts or yields in such a manner as to cause minimum damage to an aircraft.

**frangible coupling**: Mounting coupling for lights, signs and navigational aids designed to shear at a defined force, reducing the possibility of loss of aircraft control, damage and injury.

**fuel farm**: A consolidated location for bulk fuel storage and equipment, on or off an airport.

**fuel flowage fee**: Fixed fee added to each gallon of fuel pumped or percentage added to fuel purchased at the airport to support airport operations, which is generally collected from a private entity that provides the fueling services and is remitted to the airport owner.

**fueling agent**: A person or company that sells fuel products on the airport.

**full-depth reclamation (FDR)**: The full thickness of the asphalt pavement and a predetermined portion of the base, subbase and subgrade is uniformly pulverized and blended to provide a homogeneous material.

**functional annexes**: Plans organized around the performance of broad tasks such as command and control, communications, health and medical, etc. Because functional annexes are operations oriented, their target audiences are those who perform the tasks.

## G

**general aviation (GA)**: All civil aviation (excluding military) except those classified as air carrier or air taxi. The types of aircraft typically used in GA activities vary from multiengine jet aircraft to single-engine piston aircraft for purposes such as personal, business and instructional flying.

**general aviation airport**: Airport not classified as commercial service or military.

**general aviation operations**: Operations performed by all civil aircraft not classified as air carrier, military or air taxi aircraft.

**general liability insurance**: A standard insurance policy issued to businesses to protect them against liability claims for bodily injury and property damage.

**geographic information system (GIS)**: A system designed to capture, store, manipulate, analyze, manage and present spatial or geographic data.

**glideslope**: An angle approach to a runway utilizing the glideslope antenna of an instrument landing system.

**global positioning system (GPS)**: A satellite-based navigation system operated by the Department of Defense, providing accurate latitude and longitude positions, times and speeds to civilian and military users.

**graduated lease**: A lease that includes variable terms. The variable terms are triggered to change after a specific event takes place, such as periodic appraisals, the tenant's gross income changes or the passage of time.

**grant assurances**: Obligations, undertaken by the airport sponsor, when they accept funds from the FAA-administered airport financial assistance program.

**greenhouse gases (GHG)**: Any gas emitted into the atmosphere that has the potential to trap heat. The most common GHG occurring at airports are carbon dioxide, methane and nitrous oxide.

**ground power unit (GPU)**: A ground equipment support device that provides electrical aircraft power.

## H

**hangar**: A large building at an airport where planes can be stored and maintained.

**hard resiliency**: The direct strength of structures or facilities and their ability to absorb and function under the impacts of a natural or man-made disaster.

**hazard**: A condition, object or activity with the potential for causing damage, loss or injury.

**hazardous material**: Any item or agent, including biologic, chemical, radiologic or physical, that has the potential to cause harm to humans, animals or the environment.

**hazardous wildlife**: Any species of wildlife, both feral animals and domesticated animals not under control, that are associated with aircraft strike problems, are capable of causing structural damage to airport facilities or act as attractants to other wildlife that pose a strike hazard.

**hazard to air navigation**: An existing or proposed object that will have a substantial adverse effect upon the safe and efficient use of navigable airspace by aircraft.

**horizontal surface**: A horizontal plane 150 feet above the established airport elevation, the perimeter of which is constructed by swinging arcs of specified radii from the center of each end of the primary surface of each runway of each airport and connecting the adjacent arcs by lines tangent to those arcs. The radii of the arcs are 5,000 or 10,000 feet, depending on runway category or approach type.

**hot spot**: A location on an airport with a history of potential risk of collisions identified by the FAA and where heightened attention by pilots is necessary.

**hub airport**: An airport where passengers transfer from one airplane to another to reach their intended destination.

**human resources (HR)**: The department of a business or organization that deals with the hiring, administration and training of personnel.

**Incident Command System (ICS)**: A standardized on-scene incident management concept designed to allow responders to adopt an integrated organizational structure equal to the complexity and demands of any single incident or multiple incidents without being hindered by jurisdictional boundaries.

**incompatible land use**: Residential, public, recreational and certain other noise-sensitive land uses that are designated as unacceptable within specific ranges of cumulative (Ldn) noise exposure, as set forth in Table 2 of Appendix A of FAR Part 150.

**incremental budget**: The most used budgeting technique. Typically adds increments to the prior year's budget based on changing conditions and new requirements; anticipates line-item trends for the new budget year.

**indemnification**: The language for the tenant to hold harmless or indemnify the airport sponsor from legal action that may be filed against the lessee.

**independent fee estimate (IFE)**: A process in which an airport sponsor requests cost estimates for professional services from sources other than the consultant selected for the work, to ensure the proposed fee for the work is reasonable.

**induced, indirect and multiplier economic impacts**: The benefits resulting from the recirculation of direct impacts within the economy.

**information technology (IT)**: Study or use of a system (especially computers and telecommunications) for storing, retrieving and sending information.

**inner marker**: Innermost marker beacon on an instrument landing system.

**instrument approach procedure (IAP)**: A series of predetermined maneuvers for the orderly transfer of an aircraft under instrument flight conditions from the beginning of the approach to a landing, or to a point from which a landing may be completed with visual references. (See instrument flight rules).

**instrument flight rules (IFR)**: A set of regulations and procedures permitting qualified and current IFR pilots to penetrate clouds and low-visibility conditions. Aircraft must be equipped with radio and navigation instruments and operate under air traffic control flight plans and clearances. Flights are monitored and traffic is separated by air traffic control. (See also visual flight rules).

**instrument landing system (ILS)**: A precision instrument approach system utilizing radio transmitters at the runway ends that provides precise descent and course guidance to the runway, permitting aircraft to land during periods of low ceilings or poor visibility.

- *Category I (CAT I)*: An instrument approach or approach and landing with a height above threshold (HATh) or minimum descent altitude not lower than 200 feet and with either a visibility not less than ½ statute mile or a runway visual range not less than 1,800 feet.
- *Category II (CAT II)*: An instrument approach or approach and landing with a HATh lower than 200 feet but not lower than 100 feet and a runway visual range not less than 1,200 feet.
- *Category III (CAT III)*: An instrument approach or approach and landing with a HATh lower than 100 feet or no HATh, or a runway visual range less than 1,200 feet.

**insurance broker**: An insurance intermediary that represents the insured.

**International Civil Aviation Organization (ICAO)**: A United Nations specialized agency established to manage the administration and governance of the Convention on International Civil Aviation (Chicago Convention).

**into plane fee (ITP)**: The fee charged to the fuel recipient for providing the fueling service when the recipient has prepurchased the fuel.

**irregular operations (IROPS)**: Events that disrupt optimized flight schedules and negatively impact the normal flow of passengers through the air transportation system.

**irregular operations (IROPS) champion**: The point person who has been identified by an airport's management as responsible for handling coordination between all service providers and developing an airport's IROPS plan.

**island**: An unused paved or grassy area between taxiways, between runways or between a taxiway and a runway. Paved islands are clearly marked as unusable, either by paint or the use of artificial turf.

**itinerant operation**: An arrival or departure performed by an aircraft from or to a point beyond the local airport area. Also defined as all aircraft arrivals and departures other than local operations.

## J

**Jet A**: A type of aviation fuel used in aircraft powered by gas-turbine engines.

**joint-use airport**: An airport owned by the Department of Defense, at which military and civilian aircraft make shared use of the airfield (FAR §139.5). This term may also be used to refer to the mixed military and civilian use of a civilian airport.

**joint-use areas**: The areas of a civilian airport that are used by civilian and military aircraft. This is generally limited to runways and taxiways.

## K

**key performance indicator (KPI)**: A defined, quantifiable performance measurement used to help assess how an organization is performing relative to its goals.

**knot (nautical mile per hour)**: Most common measure of aircraft speed. 100 knots equals 115 statute miles per hour (for statute miles per hour, multiply knots by 1.15).

## L

**landing distance available (LDA)**: The runway length declared available and suitable for landing an aircraft.

**landing fee**: A charge paid by an aircraft owner to an airport for landing at a particular airport.

**land lease**: A long-term land lease, generally for the purpose of erecting a building or buildings or for constructing improvements to the land to be used by lessee. The land lease should reference the airport's rules, regulations and minimum standards. The land lease price per square foot could vary by location, possibly by the length of the term, and may be connected to a business permit or a fixed-base operator lease.

**land release**: The release of airport property not needed for present or future aeronautical purposes but subject to federal obligations from the terms of the agreement with the U.S. government. It is defined as the formal, written authorization discharging and relinquishing the FAA's right to enforce an airport's contractual obligations.

**land-use compatibility**: The compatibility of land uses surrounding an airport with airport activities, particularly with the noise from aircraft operations.

**land-use density**: As it relates to residential land uses, the number of dwelling units allowed to be developed in a given area within a land use specified in a community's comprehensive plan.

**land-use intensity**: As it relates to uses other than residential, a measure of allowable square footage allowed to be developed in a given area within a land use specified in the comprehensive plan (or zoning document).

**large aircraft**: An aircraft with a maximum certificated takeoff weight of more than 12,500 pounds.

**Leadership in Energy and Environmental Design (LEED®)**: A rating system created by the U.S. Green Building Council that recognizes best-in-class building strategies and practices for sustainable features.

**lessee**: The person or business that is leasing the property from the owner.

**lessor**: The owner of the property that is being leased. This is typically the airport sponsor or controlling agency with the authority to enter into contractual agreements.

**liability limit**: The set amount beyond which an insurance company is not liable for payments due to a third party. The insured remains legally liable above this limit.

**liens**: Financial costs associated with improvements on airport property funded through a lending institution typically require some sort of security for the face value of the loan.

**local area augmentation system (LAAS)**: An enhancement of the global positioning system providing greater navigation accuracy and system integrity.

**local area network**: A computer network covering a smaller physical space, such as an airport terminal, without the need for long-distance cabling.

**localizer (LOC)**: Part of an instrument landing system that provides lateral deviations from a preset course.

**local operation**: An aircraft operation that remains no more than 25 nautical miles from the departure point, or terminates at the point of departure or does not include a stop of a duration greater than 15 minutes. Touch-and-go operations are local operations.

**local traffic**: Aircraft operating in the traffic pattern or within sight of the tower, aircraft known to be departing or arriving from flight in local practice areas or aircraft executing practice instrument approaches at the airport.

**loss**: The basis for claim for damages under the terms of a policy.

**low approach**: An approach over an airport or runway following an instrument approach or a visual flight rules approach, including the go-around maneuver in which a pilot intentionally does not make contact with the runway.

## M

**magnetic heading**: Heading of the aircraft relative to magnetic north; a magnetic heading sensor provides this heading data.

**magnetic variation (MVAR, MAGVAR)**: Difference between true north and magnetic north, varying with position. Magnetic variation drifts with time.

**main gear width**: The distance from the outer edge to outer edge of the widest set of main gear tires.

**major airport development**: Airport development on such a scale as to require shifts in patterns of population movement and growth, public service demands and changes in business and economic activity.

**marketing plan**: A comprehensive document that describes an airport's marketing activities in the upcoming fiscal year and beyond.

**market value**: The highest price a property would command in a competitive and open market under all conditions requisite to a fair sale, with the buyer and seller each acting prudently and knowledgeably in the ordinary course of trade.

**mean sea level (MSL)**: Altitude expressed as feet above sea level, rather than above local terrain (i.e., above ground level). To ignore varying terrain elevations, all navigational altitudes and barometric altimeters are based on height above MSL. Only radar altimeters, which measure the distance between the aircraft and the ground at low altitudes, indicate actual height above the ground.

**media relations plan**: A document that provides the organized process of how to interact with the media with clarity and purpose.

**memorandum of agreement (MOA) or memorandum of understanding (MOU)**: A document outlining the cooperative agreement and the roles and responsibilities of each party to the agreement.

**metropolitan statistical area (MSA)**: A geographical area defined by the U.S. Office of Management and Budget for use by federal statistical agencies in collecting, tabulating and publishing federal statistics.

**microwave landing system (MLS)**: An advanced electronic system of ground-based devices and aircraft avionics that provides the aircraft with lateral, longitudinal and vertical guidance necessary for an instrument landing. In the United States, MLS technology has been supplanted by the global positioning system.

**middle marker**: Marker beacon located where the center of the glideslope is 200 feet above the runway, utilized in some instrument landing systems.

**Military Airport Program**: FAA program that assists former military airports in transitioning to civilian ownership.

**military operation**: Operations performed by military groups such as the Air National Guard, U.S. Air Force, U.S. Army, U.S. Marine Corps or U.S. Navy.

**military operations area**: An airspace established outside of Class A airspace to separate or segregate certain nonhazardous military activities from instrument flight rules traffic and to identify for visual flight rules traffic where these activities are conducted.

**minimums**: Weather condition requirements established for a particular operation or type of operation—e.g., instrument flight rules takeoff or landing, alternate airport for instrument flight rules flight plans, etc.

**minimum standards**: Sponsor-established minimum service levels and development space requirements for commercial aeronautical activities at the airport.

**missed approach**: A maneuver conducted by a pilot when an instrument approach cannot be completed for a landing. The route of flight and altitude are shown on instrument approach

procedure charts. A pilot executing a missed approach prior to the missed approach point (MAP) must continue along the final approach to the MAP. The pilot may immediately climb to the altitude specified in the missed approach procedure.

**missed approach point (MAP)**: A point prescribed in each instrument approach procedure at which a missed approach procedure will be executed if the required visual reference does not exist.

**missed approach segment**: The segment of the approach procedure, which protects the safety of aircraft executing a missed approach procedure.

**mission**: An airport's mission statement is its reason for existing: its function and purpose. Mission statements typically emphasize an airport's core values, identity and competencies.

**mitigation**: A risk response strategy that involves minimizing either the probability of the threat event or the impact (or both).

**mitigation measure**: An action that can be planned or taken to alleviate (mitigate) an adverse environmental impact.

**Mode A**: The operating mode of onboard radar transponders that transmits a return radio signal to enhance an aircraft's radar return and identify it with one of 4,096 controller-assigned numerical codes.

**Mode C**: The transponder operating mode that also reports aircraft altitude by transmitting data from an encoding altimeter.

**Mode S**: Type of secondary surveillance radar equipment that provides Mode A and Mode C interrogations, discrete address (Mode S) interrogations from the ground or air and a data link capability.

**modification to standards (MOS)**: Any approved nonconformance to FAA standards to airport design, construction or equipment procurement. MOSs are issued by the FAA on a case-by-case basis after it is demonstrated that an acceptable level of safety, economy, durability and workmanship would still exist.

**mogas**: Automotive fuel that is used in some aircraft with the proper FAA certifications.

**movement area**: The runways, taxiways and other areas of an airport that are used for taxiing or hover taxiing, air taxiing, takeoff and landing of aircraft, including helicopters and tilt-rotors.

**multiplier economic impacts**: Estimated based on direct impacts using regional input-output models that use region-specific economic data to trace inter-industry relationships.

**mutual aid agreement**: A voluntary, noncontractual arrangement to provide short-term emergency or disaster assistance between two or more entities. It typically does not involve payment, reimbursement, liability or mandatory responses.

## N

**National Airspace System (NAS)**: The airspace, navigation facilities and airports of the United States along with their associated information, services, rules, regulations, policies, procedures, personnel and equipment.

**National Air Transportation Association (NATA)**: A trade association that represents aviation service businesses; its mission is to be the leading national trade association representing

the legislative, regulatory and business interests of general aviation service companies and to provide education, services and benefits to members to help ensure long-term economic success.

**National Ambient Air Quality Standards (NAAQS)**: Maximum acceptable levels of regulated air pollutants, including an acceptable margin of error, meant to safeguard human health.

**National Business Aviation Association (NBAA)**: A trade association that represents organizations using general aviation aircraft for business purposes; its mission is to be committed to promoting an environment that fosters business aviation in the United States and around the world.

**National Environmental Policy Act (NEPA)**: A U.S. environmental law that established a U.S. national policy promoting the enhancement of the environment. NEPA requires each federal agency to disclose to the public a clear, accurate description of the potential environmental impacts that the proposed federal action and reasonable alternative to those actions would cause.

**National Incident Management System (NIMS)**: A systematic, proactive approach to guide departments and agencies at all levels of government, nongovernmental organizations and the private sector in seamlessly working together and managing incidents involving all threats and hazards—regardless of cause, size, location or complexity—to reduce the loss of life, loss of property and harm to the environment.

**National Plan of Integrated Airport Systems (NPIAS)**: Public-use airports considered necessary to provide a safe, efficient and integrated system of airports to meet the needs of United States civil aviation, national defense and the U.S. Postal Service.

**National Pollutant Discharge Elimination System (NPDES)**: The Environmental Protection Agency's program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements under the Clean Water Act.

**National Transportation Safety Board (NTSB)**: The independent federal agency charged with investigating and finding "probable cause" of transportation accidents.

**nautical mile**: The most common distance measurement in aviation, equivalent to 1.15 statute (standard U.S.) miles.

**navigable waters**: Interstate waters; interstate lakes, rivers and streams that are used by interstate travelers for recreational or other purposes; interstate lakes, rivers and streams from which fish or shellfish are taken and sold in interstate commerce; and the tributaries of such waters.

**navigational aid (NAVAID)**: Any form of aid to navigation designed to assist the pilot with position and height information and wind conditions. Examples: instrument landing systems, visual approach slope indicators, precision approach path indicators, wind cones and very high frequency omnidirectional ranges.

**net lease**: A lease in which the payments to the lessor do not include insurance and maintenance expenses, which usually are separately paid by the lessee.

**Next Generation Air Transportation System (NextGen)**: A federal program to transform the National Airspace System from a ground-based system to a satellite-based system.

**N-numbers**: Federal government aircraft registration numbers. U.S.-registered aircraft numbers begin with N, Canadian numbers with C or CF, German numbers with D, U.K. numbers with G, French numbers with F, Japanese numbers with JA, etc.

**noise contours**: Lines drawn on a map that connect points of equal noise-exposure values. They are usually drawn in 5 dB intervals, such as day–night average sound level (DNL) 75 dB values, DNL 70 dB values, DNL 65 dB values and so forth.

**noise control plans**: Documentation by the airport sponsor of actions to be taken by the sponsor to reduce the effect of aviation noise. These actions are to be taken by the sponsor alone or in cooperation with the FAA, airport users and affected units of local government, with appropriate comments from affected citizens. Alternative actions should be considered, particularly when proprietary use restrictions on aircraft operations are involved.

**nonaeronautical revenue**: Revenue generated from nonaeronautical activity, which is a broad category that encompasses the passenger-dependent activities such as food and beverage, retail concessions, parking and rental cars as well as rent on land and nonterminal facilities and fees collected for activities and services on airport property. Ground lease and property development revenues derived from property that has the long-term designation of "nonaeronautical," or not needed in the long term for supporting aeronautical activities, can also be classified as nonaeronautical revenue.

**nonaeronautical-use lease**: Not all tenants on an airport may operate an aircraft or provide an aviation-related service. This type of lease will be specific to the type of nonaeronautical land use while complying with FAA grant assurance conditions, if the property was originally purchased through a federal grant. A common nonaeronautical use on a small airport is leasing ground for farming operations.

**nonattainment area**: An area that does not meet one or more of the criteria for pollutants of the National Ambient Air Quality Standards, as defined in the Clean Air Act of 1970.

**nondirectional beacon (NDB)**: An older radio navigation system in which an automatic direction finder points to the beacon, thus providing a relative bearing.

**nonhub commercial service airport**: Airport with more than 2,500 annual passenger boardings (enplanements) but less than 0.05 percent of the national passenger boardings.

**nonmovement area**: The areas of an airport that are used for taxiing or hover taxiing, or air taxiing aircraft including helicopters and tilt-rotors, but are not part of the movement area (i.e., the loading aprons and aircraft parking areas).

**nonprecision approach procedure**: A standard instrument approach procedure with minimums not lower than ¾ mile and/or 250-foot ceiling, for which at least horizontal guidance is provided with a ground-based navigational aid or global positioning system. A nonprecision approach utilizing the global positioning system may also provide vertical guidance, depending on the approach and equipage of the aircraft.

**nonprecision instrument runway**: A runway where the best approach is a nonprecision instrument approach procedure and no precision approach facility or procedure is planned.

**nonprimary airport**: A National Plan of Integrated Airport Systems airport with 10,000 or fewer than 10,000 annual passenger boardings (enplanements).

**nonprimary commercial service airports**: Airports with scheduled passenger service and annual passenger boardings (enplanements) of between 2,500 and 10,000.

**nontowered airport**: An airport without a control tower. The majority of America's 13,000 airports are nontowered (only 680 airports have control towers). Nontowered airports are far from being "uncontrolled." Pilots follow traffic pattern procedures and self-announce positions and intentions using the common traffic advisory frequency, usually called the UNICOM (universal communications) frequency.

**nontraditional revenue sources**: Any local source that can be developed at the airport for enhancing the revenue base (e.g., oil, gas and mineral rights; nonaeronautical property development; local agriculture, forestry, hunting rights; solar installations; airport cities or mixed-use development; etc.)

**Notice to Airmen (NOTAM)**: A notice containing information concerning the establishment of, condition of, or change to any component (facility, service or procedure) of or hazard in the National Airspace System, the timely knowledge of which is essential to personnel concerned with flight operations.

**Notice to Airmen (NOTAM) Manager**: The modernized NOTAM system that digitizes the collection, dissemination and storage of NOTAMs.

## O

**object-free area (OFA)**: The area of the airport centered on the runway, taxiway or taxilane centerline provided to enhance the safety of aircraft operations by having the area free of objects, except for those that are necessary for air navigation or aircraft ground maneuvering, which are required to be mounted on frangible couplings.

**obstacle**: An existing object, object of natural growth or terrain at a fixed geographical location, or one that may be expected at a fixed location within a prescribed area, with reference to which vertical clearance is or must be provided during flight operation.

**obstacle clearance surface (OCS)**: A surface that defines the minimum required obstruction clearance for approach or departure procedures.

**obstacle-free zone (OFZ)**: A volume of space above and adjacent to a runway and its approach lighting system, if one exists, free of all fixed objects except FAA-approved frangible aeronautical equipment and clear of vehicles and aircraft in the proximity of an airplane conducting an approach, missed approach, landing, takeoff or departure.

**obstruction**: An object that exceeds a limiting height or penetrates an imaginary surface described by current Federal Aviation Regulations (Part 77).

**Obstruction Evaluation/Airport Airspace Analysis (OE/AAA)**: A public website provided by the FAA to enable individuals and organizations engaged in sponsoring the construction or alteration of potential obstructions on and off airport property to easily notify the FAA of their intents and activities. This allows the FAA to evaluate the impacts of these activities on the airspace system.

**Occupational Safety and Health Administration (OSHA)**: An agency within the U.S. Department of Labor, responsible for assurance of "safe and healthful working conditions" through setting and enforcing labor standards and educational and training outreach on workplace safety.

**on-airport**: Activities occurring on an airport. These activities broadly include airside activities, terminal services to passengers (including concessions), air-related services by government agencies, construction and airport administration.

**operating cost escalation**: Although there are many variations of escalation clauses, all are intended to adjust rents by reference to external standards, such as published indexes, negotiated wage levels or expenses related to the ownership and operation of buildings.

**operation**: A takeoff or a landing.

**operational maintenance**: Activities performed to keep an airport operating due to weather or environmental conditions, such as snow and foreign object debris removal.

**outer marker**: Marker beacon located 5 to 7 miles from the end of the runway and a component of incompatible land use.

**overlay zoning**: A regulatory tool that creates a special zoning district, placed over an existing base zone(s), which identifies special provisions in addition to those already in place in the underlying base zone.

**owned media**: Content the airport is in control of—its website, social media, etc.

## P

**paid media**: Advertising purchased through publications, radio or television stations, websites and social media.

**parallel taxiway**: A taxiway parallel to a runway.

**passenger facility charge (PFC)**: A program for the collection of fees per enplaned passenger per flight segment, with a maximum of two flight segments.

**passenger leakage**: The passengers who leave the airport catchment area to access air service from a competing airport instead of the nearest airport, often because of lower fares, more flights or better reliability.

**passenger revenue**: The multiplication of revenue passenger miles by the yield.

**passenger yield**: The average fare per passenger mile.

**pavement condition index (PCI)**: A numerical rating of the pavement condition based on a visual observation of distresses.

**pavement classification number**: A number that expresses the load-carrying capacity of a pavement for unrestricted operations.

**pavement management program**: Also referred to as pavement maintenance management program or pavement management system. Procedures for collecting, analyzing, maintaining and reporting pavement data to assist airport management in finding optimum strategies for maintaining pavements in a safe, serviceable condition over a given period of time for the least cost.

**pavement reconstruction**: May be necessary in situations when there is no redeemable pavement life (rehabilitation is not a viable option), corrections are needed in the subgrade, there are changes to geometrics or there is an increase in traffic volume.

**pavement rehabilitation**: Techniques include overlays and full-depth reclamation.

**pavement routine maintenance**: Maintenance required to preserve the pavement to achieve the design life and that is planned and performed on a routine basis, such as yearly crack sealing and a regular inspection of the pavements.

**peer review**: Allowing airport operators to seek guidance and advice from airport-manager peers who have experienced similar circumstances or operate within similar constraints.

**performance-based budget**: This budgeting technique begins with established performance goals, or return-on-investment goals, and attempts to ensure that capital and operating expenditures are set to achieve these goals.

**performance-based navigation (PBN)**: The broad range of technologies that rely on the performance and capabilities of equipment on board the aircraft.

**phonetic alphabet**: A list of words used in aviation with the intent to reduce the possibility of a misunderstanding.

**pilot-controlled lighting (PCL)**: A remote system controlled by a pilot to initiate and operate the runway lights. It is typically located at a nontowered airport.

**pilot weather report (PIREP)**: Voluntary pilot observation of in-flight weather conditions radioed to air traffic control or a flight service station. Information is used by other pilots to avoid adverse weather and by the National Weather Service to amend or update forecasts.

**policymakers**: Individuals who have the authority to set the policy framework of (or determine the policies for) an organization. In the case of small airports, policymakers include the members of the airport's governing body or airport sponsor. Some examples of policymakers include city council members, county commissioners and airport board members.

**port of entry**: An official location where U.S. Customs and Border Protection officers or employees are assigned to accept entries of merchandise and passengers, collect duties and enforce the provision of the U.S. Customs and Border Protection and related laws.

**post**: In regard to social media, an item on a blog or Facebook.

**precision approach path indicator (PAPI)**: A visual aid that provides guidance information to help a pilot acquire and maintain the correct approach, relative to aircraft altitude, to a runway.

**precision instrument procedure**: A standard instrument procedure for an aircraft to approach an airport in which a vertical and horizontal guidance is provided to the pilot using an instrument landing system, military precision approach radar or global positioning system, with visibility of ¾ mile or less or a ceiling less than 250 feet.

**precision instrument runway**: A runway with an instrument approach procedure utilizing an instrument landing system, microwave landing system, precision approach radar or global positioning system providing precision approach minimums.

**preferential runway use (program)**: A noise abatement action whereby the FAA Air Traffic Organization, in conjunction with FAA Airports, assists the airport sponsor in developing a program that gives preference to the use of a specific runway(s) to reduce overflight of noise-sensitive areas.

**preferential-use space**: Space rented to an airline in which it has preferred, but not exclusive, use of the space and may be required to share the space if a certain level of activity is not maintained.

**premises**: The premises, or leased area, define the land and improvements subject to the lease agreement. The agreement should include a legal description of the premises, including size and location, included improvements and equipment.

**press kit**: A document that contains information and photographs about the airport and is used to submit publicity materials to the media for consideration.

**preventive maintenance**: Actions performed to detect, preclude or mitigate the failure of the infrastructure system or its components, including routine scheduled activities, to keep a system performing at its best.

**preventive maintenance program**: A program designed to identify and correct deficiencies before failures occur, thus preventing costly repairs or replacements.

**primary airport**: Publicly owned airport with scheduled air carrier service and more than 10,000 passenger boardings (enplanements) per year.

**primary surface**: A surface longitudinally centered on a runway. When the runway has a specially prepared hard surface, the primary surface extends 200 feet beyond each end of that runway; but when the runway has no specially prepared hard surface, the primary surface ends at each end of that runway. The elevation of any point on the primary surface is the same as the elevation of the nearest point on the runway centerline. The surface width varies from 250 feet to 1,000 feet, based on the runway category and approach type.

**private pilot**: A certificate that allows a pilot to fly passengers for personal transportation and business. It requires the pilot to be at least 17 years old, have a minimum of 40 hours of flight experience and training (35 hours under FAR Part 141), and pass at least a third-class medical exam, a written exam and a flight test. A private pilot may not "fly for hire or compensation" but may share expenses equally with passengers.

**prohibited area**: An airspace area for which flight is prohibited, except by prior arrangement with the controlling agency. An example is the P-56 area over downtown Washington, D.C., which prohibits flight over the White House.

**proprietary exclusive rights**: The owner of a public-use airport may provide aeronautical services to the public at the airport. This right may be exercised by the airport in the absence of a qualified commercial operator or when it is in the best interest of the public and must be provided by the airport owner's staff.

**public accommodation**: A facility, operated by a private entity, with operations that affect commerce and provide one or more of the following: lodging, food and beverage service, exhibition or entertainment, places for public gathering, sales or rental of goods or services, public transportation, recreational services, educational services, social services and places for exercise or recreation.

**public airport**: Any airport that is used or to be used for public purposes, in the control of a public agency, the land area of which is publicly owned.

**public entity**: Any state or local government, or any department, entity, special district or other instrumentality thereof.

**public hearing**: A gathering under the direction of a designated hearing officer for the purpose of allowing interested parties to speak and hear about issues of concern.

**public-use airport**: Airport available for public use; may be publicly or privately owned.

## Q

**qualifications-based selection**: A fair and open selection process based on the qualifications and experience of the firms. It is required for architectural, engineering and planning services for Airport Improvement Program grant-funded projects and may be required for non–Airport Improvement Program projects based on state procurement laws.

## R

**rates**: A fixed price paid for something for which there is value, usually property, buildings or fixed assets.

**reactive maintenance**: Fixing something after it breaks.

**record of decision (ROD)**: A written decision of the FAA's approval or disapproval of an action proposed in an environmental impact statement. The ROD explains what the airport sponsor proposes to do and why, identifies actions the FAA and other federal agencies must take, explains the alternatives analyzed and which one is environmentally preferred and identifies the required mitigation measures.

**recreational pilot**: A pilot certificate requiring less training than a private certificate. Privileges are limited according to flight within 50 nautical miles of base, carrying no more than one passenger; using nontowered airports; and flying during daylight hours only, unless restrictions are removed through further training. A recreational pilot may not share expenses. Few new pilots currently choose the recreational certificate.

**regional airport**: An airport that is geographically associated near a hub airport and therefore is an important participant in coordinated planning.

**regulations**: Rules issued by the executive branch departments and agencies of the federal government and codified in the Code of Federal Regulations.

**reliever airports**: General aviation airports in metropolitan areas that provide pilots with an alternative to using congested commercial service airports or provide general aviation access to the surrounding area.

**remote pilot airman certificate**: FAA authorization to operate unmanned aircraft systems for other-than-recreational purposes in the United States. This replaces the previous certificate of authorization under Section 333 of the FAA Modernization and Reform Act of 2012.

**remote pilot in command with UAS rating**: A certified remote pilot airman responsible for small unmanned aircraft systems operation.

**renewal option**: A clause giving a tenant the right to extend the term of a lease, usually for a stated period of time, and at a rent amount given in the option language.

**required navigation performance (RNP)**: A type of performance-based navigation that allows an aircraft to fly a specific path between two three-dimensional defined points in space.

**residual rate methodology**: Signatory airlines agree to pay any costs of operating the airport system, airport or a specific cost center that are not allocated to other users or covered by nonairline revenues. Signature airlines assume the risk of overall revenue shortfall and receive the benefit from any revenue surpluses.

**restricted area**: Airspace that (when "active" or "hot") usually excludes civilian aircraft. Examples include airspace for rocket flights, air-to-air combat practice or ground-based artillery practice. Temporary restricted areas are established for events such as forest fires, natural disasters or major news stories. Flight through a restricted area may be authorized by the "controlling agency" or the FAA.

**retention ponds**: Stormwater management ponds that hold water for long periods of time, generally more than 48 hours.

**revenue diversion**: Use of airport revenue for nonaeronautical uses or for payments in excess of stated tax rates or the value of services received.

**reversionary clause**: The reversion of ownership of the improvements by the lessee to the landlord at the end of the lease agreement.

**right of entry**: The lessor needs to have the right to enter the hangar for inspection purposes and to make repairs.

**risk**: The chance of loss or injury measured in terms of severity and probability.

**risk management**: The practice of dealing with risks in a process-oriented fashion to keep risks within organizational tolerances.

**risk management plan**: A document outlining the details of risk management approaches, responsibilities, resources, terms, tolerances, timing and processes.

**rotating beacon**: A rotating light providing visual guidance for the airport between sunset and sunrise and during times when the reported ceiling or visibility is below basic visual flight rules minimums.

**rules and regulations**: The document adopted by the airport sponsor to govern the general conduct of the public, tenants, employees and commercial users of the airport.

**runway (RWY)**: A defined rectangular area on a land-based airport that is prepared for the landing and takeoff run of aircraft along its length. Runways are normally numbered in relation to their magnetic direction, rounded off to the nearest 10 degrees, e.g., Runway 01, Runway 25.

**Runway Condition Assessment Matrix (RCAM)**: Chart providing the criteria to assist airport operators in identifying the runway conditions during winter or rain events.

**runway design code (RDC)**: A code signifying the design standards to which the runway is to be built.

**runway edge lights**: Lights used to define the lateral limits of a runway.

**runway end identifier lights (REILs)**: Two synchronized flashing lights, one on each side of the runway threshold, that provide a pilot with a rapid and positive visual identification of the approach end of a particular runway.

**runway heading**: The magnetic direction indicated by the runway number. When cleared to "fly/maintain runway heading," pilots are expected to comply with the air traffic control clearance by flying the heading indicated by the runway number without applying any drift correction—e.g., Runway 4, 040 magnetic heading; Runway 20, 200 magnetic heading.

**runway holding position (hold line)**: The purpose of holding-position markings is to prevent aircraft and vehicles from entering critical areas associated with a runway or navigational aids or to control traffic at the intersection of taxiways.

**runway incursion**: A top FAA safety concern, runway incursions are defined by the FAA as "any occurrence at an aerodrome involving the incorrect presence of an aircraft, vehicle or person on the protected area of a surface designated for the landing and takeoff of aircraft." Runway incursions can be caused by pilot deviations, air traffic controller operational incidents and ground vehicle deviations.

**runway protection zone (RPZ)**: A trapezoidal area at ground level off the runway end to enhance the protection of people and property on the ground, which is achieved through airport owner control over RPZs. Such control includes clearing RPZ areas (and keeping them clear) of incompatible objects and activities. Control is preferably exercised through the acquisition of sufficient property interest in the RPZ.

**runway safety area (RSA)**: A cleared, drained, graded and preferably turfed area symmetrically located about the runway which, under normal conditions, is capable of supporting snow removal, firefighting and rescue equipment and of accommodating the occasional passage of aircraft without causing major damage to the aircraft.

**runway threshold**: The beginning of that portion of a runway usable for landing or takeoff.

**runway visual range (RVR)**: Visibility along a runway. At major airports, it is measured automatically by transmissometer.

## S

**safety management system (SMS)**: A top-down, organization-wide approach to managing safety risk and assuring the effectiveness of safety risk controls. It includes systematic procedures, practices and policies for managing safety risk.

**safety risk assessment (SRA)**: Assessment of a system or component, often by a panel of system subject matter experts and stakeholders, to compare an achieved risk level with the tolerable risk level.

**safety risk management (SRM)**: A standard set of processes to identify and document hazards, analyze and assess potential risks and develop appropriate mitigation strategies.

**safety risk mitigation**: Anything that mitigates the safety risk of a hazard.

**scheduled operation**: Any common carriage passenger-carrying operation for compensation or hire conducted by an air carrier, for which the air carrier or its representatives offer in advance the departure location, departure time and arrival location.

**scoping**: An early and open process for determining the scope of issues to be addressed in an environmental assessment or environmental impact statement and identifying the significant issues related to a proposed action. The purpose of scoping is to identify significant environmental issues to be analyzed in greater depth, identify and eliminate from detailed study issues that are insignificant or that have been covered by prior environmental review and set the temporal and geographic boundaries of the environmental impact statement.

**secondary containment**: A control measure placed or built around a storage vessel to prevent its contents from flowing into the drainage system during a spill or discharge, typically associated with a fueling system.

**Section 333**: Part of the FAA Modernization and Reform Act of 2012 that grants the FAA the authority to determine and grant operators of unmanned aircraft systems the authorization to operate in the National Airspace System, subject to certain restrictions and requirements.

**Section 333 exemption**: Part of the FAA Modernization and Reform Act of 2012 that predates FAR Part 107; a case-by-case approval process for commercial operations of unmanned aircraft systems in the National Airspace System that provides operators with a safe and legal entry into the National Airspace System, subject to certain requirements and restrictions.

**sector or area planning**: Area plans may be developed as a segment of a community master plan/comprehensive plan to set forth overarching goals and growth strategy for a large geographical area.

**security**: The type of deposit or security fee, and the conditions under which it is to be paid and returned to the lessee, should be identified as part of the lease.

**security fencing**: Fencing of chain link fabric used to secure the air operations area or airport perimeter. This can be accomplished in a variety of ways, including installation of fencing of heights from 6 to 10 feet, and may be topped with three strands of barbed wire.

**security identification display area (SIDA)**: A secure area of the airport that requires an appropriately vetted employee to have and display a security identification badge.

**self-fueling**: The fueling or servicing of an aircraft by the owner of the aircraft.

**self-inspection program**: A program to find potential hazards and address them to keep the airport in good operating condition. The program includes four types of inspections generally used by airports as part of a self-inspection program: routine or scheduled, continuous surveillance, periodic condition and special inspections.

**sensitive security information (SSI)**: Information that, if publicly released, would be detrimental to transportation security. SSI is not classified information, but there are specific procedures for recognizing, marking, protecting, safely sharing and destroying SSI.

**service animal**: A dog that has been trained to do work or perform tasks for an individual with a disability. The tasks performed by the dog must be directly related to the person's disability.

**set-aside funding**: Minimum percentages or amounts that represent requirements for dedicated Airport Improvement Program funding, including funding of noise-compatibility projects, military airport programs, certain reliever airports and projects for capacity, safety and security.

**shoulder**: An area adjacent to the defined edge of paved runways, taxiways or aprons, providing a transition between the pavement and the adjacent surface.

**signatory airline**: An airline that executes an agreement with a particular airport. At many airports, these airlines pay lower rates and charges than nonsignatory airlines.

**small aircraft**: An aircraft with a maximum certificated takeoff weight of 12,500 pounds or less.

**small airport (as defined for this guidebook)**: General aviation, nonhub commercial service and airports with limited and/or volunteer staff.

**Small Community Air Service Development Program (SCASDP)**: Established by Congress under the Wendell H. Ford Aviation Investment and Reform Act for the 21st Century to help small communities enhance their air service. Administered by the U.S. Department of Transportation, the program provides grants to help small communities achieve sustainable air service.

**small unmanned aircraft**: An unmanned aircraft weighing less than 55 pounds (25 kilograms), including everything that is onboard or otherwise attached to the aircraft.

**small unmanned aircraft system(s) (sUAS)**: An unmanned aircraft and its associated elements, including communication links and the components that control the small unmanned aircraft, that are required for the safe and efficient operation of the small unmanned aircraft in the National Airspace System.

**snow and ice control plan (SICP)**: A document describing the airport's approach to snow removal operations, including pre- and post-season subjects, as well as the procedures for addressing winter storms and notifying users of airfield conditions.

**snow removal equipment (SRE)**: Equipment, typically trucks and tractors, used at an airport to remove snow.

**social media**: The interaction among people in which they create, share and/or exchange information and ideas in virtual communities and networks.

**social media management**: The utilization of tools to grow social media presence, monitor accounts and keep track of online activities of various social platforms.

**soft resiliency**: The ability of operational systems, including human resources, to absorb and recover from the impacts of disruptive events without fundamental changes in function or structure.

**solar farm**: The large-scale application of solar photovoltaic panels to generate green, clean electricity at scale, usually to feed into the grid.

**Solar Glare Hazard Analysis Tool (SGHAT)**: A web-based tool that predicts energy production and the potential for solar glare and ocular impacts from an array of photovoltaic panels.

**solar installation**: Any ground-based solar energy installation and those solar energy installations co-located with a building or structure (e.g., rooftop installations).

**special event**: An activity that occurs for a limited or short duration, presented to a live audience.

**specialized aviation service operator (SASO)**: Sometimes known as single-service providers or special fixed-base operators, performing less than full service. These types of companies differ from a full-service fixed-base operator in that they typically offer only specialized aeronautical service, such as aircraft sales, flight training, aircraft maintenance or avionics services.

**special-use airspace (SUA)**: All airspace for which restrictions or prohibitions to flight are imposed for military or government needs (see military operations area, restricted area and prohibited area).

**Spill Prevention, Control and Countermeasure (SPCC) plan**: Required by the U.S. Environmental Protection Agency (40 CFR §112.7) for any facility with a product storage capacity over 1,320 gallons.

**split load**: The term applied to the purchase and delivery of less than a full tanker of fuel.

**stakeholder**: A person, group or organization that has interests or concerns in the airport and can affect or be affected by the airport's actions, objectives and policies, examples of which are employees, tenants, first responders and airport traffic control tower personnel.

**stakeholder involvement**: The meaningful, timely engagement of various groups, such as passengers, tenants, state and federal agencies and the general public, who have an interest in airport activities.

**stand-alone financial system**: An off-the-shelf financial module that can be used for accounting and bill processing to support airport operations but that would not be tied to a larger, all-inclusive enterprise operating system.

**standard instrument departure (SID)**: A planned instrument flight rules air traffic control departure procedure printed for pilot use in graphic and/or textual form. SIDs provide transition from the terminal to the appropriate en route structure.

**standard terminal arrival route (STAR)**: A planned instrument flight rules air traffic control arrival route published for pilot use in graphic and/or textual form. STARs provide transition from the en route structure to an outer fix or an instrument approach fix/arrival waypoint in the terminal area.

**state apportionment**: Available for all airports within a state, excluding primary airports but including reliever and nonprimary commercial service airports, with the available funds being apportioned for airports within that state, on the basis of the state's proportional population to the total population of the eligible states and the state's proportional area to the total area of the eligible states. Only in block grant states are the state apportionment funds apportioned to the state. In non–block grant states, FAA Airports programs and disburses the funds, but the state may provide input into programming, along with using the FAA priority system.

**State Block Grant Program**: An FAA program, in which 10 states participate, that provides Airport Improvement Program funds to the state to allow the state to program, prioritize, select and fund Airport Improvement Program projects at small airports.

**state system plan**: A planning tool to identify the development needed to establish a viable system of airports within the state.

**statutes**: Laws enacted by Congress; statutes with continuing effects are generally codified in the United States Code.

**sterile area**: An area of controlled access for passengers boarding aircraft.

**stopway**: An area beyond the takeoff runway, no less wide than the runway and centered upon the extended centerline of the runway, able to support the aircraft during an aborted takeoff, without causing structural damage to the aircraft, and designated by the airport authorities for use in decelerating the aircraft during an aborted takeoff.

**stormwater pollution prevention plan (SWPPP)**: A stormwater management plan addressing stormwater discharge from the airport and incorporating best management practices.

**straight-in instrument approach**: An instrument approach wherein final approach is begun without first having executed a procedure turn, and not necessarily completed with a straight-in landing or made to straight-in landing weather minimum.

**strategic plan**: A written plan identifying the vision and long-term directional goals for an airport; typically, it has a time frame of 10 to 20 years.

**strengths, weaknesses, opportunities and threats (SWOT) analysis**: An exercise that identifies an airport's strengths, weaknesses, opportunities and threats.

**student pilot**: A pilot training for a private pilot certificate, either before or after the first solo.

**sublease**: Typically between tenants on the airport and an additional private tenant. Standard airport lease or rental agreements should include provisions, which regulate the legal authority of a tenant to sublet all or portion of a property they lease from the airport sponsor and the requirement to obtain approval from the airport sponsor prior to subleasing the property. Sublease agreements must also conform to the airport's minimum standards.

**substantial adverse aeronautical effect**: An impact on navigable airspace that necessitates a change to an instrument approach procedure, an approach minimum, an element of an airport or a navigational aid, or a change in a vectoring altitude, so as to meet minimum procedure or facility design standards. The impact has to affect at least one daily operation (or a similar cumulative annual number of operations) in order to be considered significant.

**substantially complete**: When a project is sufficiently complete in accordance with the contract documents so that the owner can occupy or use the project for its intended purposes.

**substantial use**: A situation in which a military unit has a significant enough impact on a civilian airport that reimbursement for operations and maintenance costs is warranted.

**surface movement guidance and control (SMGC)**: A combination of signage, lighting and markings that allows safer airport operations in low-visibility and normal weather conditions.

**Surplus Property Act of 1944**: An act of Congress that provided for disposition of surplus government property and infrastructure, including airports, to state and local subdivisions.

**sustainability master plans**: An FAA initiative to incorporate sustainability into the master planning process.

## T

**takeoff and landing performance assessment (TALPA)**: A method to accurately and consistently determine the runway condition when a paved runway is not dry.

**takeoff distance available (TODA)**: The takeoff run available plus the length of any remaining runway or clearway beyond the far end of the takeoff run available; the full length of TODA may need to be reduced because of obstacles in the departure area.

**takeoff run available (TORA)**: The runway length declared available and suitable for the ground run of an aircraft taking off.

**taxi**: The movement of an airplane under its own power on the surface of an airport; also, the surface movement of helicopters equipped with wheels.

**taxilane**: The portion of the aircraft parking area used for access between taxiways, aircraft parking positions, hangars, storage facilities, etc.

**taxiway (TWY)**: A defined path, from one part of an airport to another, selected or prepared for the taxiing of aircraft.

**taxiway design group (TDG)**: A classification of airplanes based on outer to outer main gear width and cockpit to main gear distance.

**taxiway/taxilane safety area**: A defined surface alongside the taxiway prepared or suitable for reducing the risk of damage to an aircraft deviating from the taxiway.

**tenant**: Any person, other than an aircraft operator or foreign air carrier, who has an agreement with the airport operator to conduct business on airport property.

**terminal area**: The space of a building used to provide passenger service to the traveling public.

**T-hangar**: A hangar building, typically containing multiple units. This type of hangar derives its name from the shape of the interior of the units (in the form of a T), which increases the efficiency of the design so as to accommodate the wingspan and the tail section of an aircraft.

**threatened species**: Any species (including animals, plants, fungi, etc.) that are vulnerable to endangerment in the near future.

**threshold**: The beginning of that portion of the runway usable for landing.

**threshold siting standards**: Runway threshold siting criteria, based on runway approach type and airplane design group.

**through-the-fence**: Access to the airfield granted by the sponsor of a public airport to a person or business that owns property adjacent to the airport for the person's or business's aircraft, or authorized aircraft, to taxi onto and use the airport.

**total cost of ownership**: Includes the cost to procure and construct a physical asset and the long-term cost to operate and maintain the asset.

**total economic impacts**: Direct impacts, plus multiplier impacts for jobs, payroll and output.

**touch-and-go operation**: A practice maneuver consisting of a landing and a takeoff performed in one continuous movement: the aircraft lands and begins takeoff roll without stopping. A touch-and-go is considered two operations.

**traffic pattern**: A standard rectangular flight pattern around the landing runway at an airport. It includes 45-degree or crosswind entry to the rectangle, with downwind, base and final legs as sides of the rectangle. Standard are 90-degree left turns around the rectangle (a nonstandard right-hand traffic pattern is noted in airport facility directories) with downwind flown at a specified altitude, usually 1,000 or 1,500 feet above the airport elevation. At airports with a control tower, the pattern may be modified or short cut according to air traffic control instructions.

**transfer of development rights arrangements**: Can be used as either a proactive measure or a mitigation measure. The program allows local governments to set up "sending" and "receiving" areas within their jurisdictional boundaries, permitting land owners to sell or transfer their land development entitlements from a less desirable (e.g., less compatible) area to an area that is more suitable for dense development.

**transient aircraft**: Aircraft not based at the airport.

**transitional surface**: Surfaces that extend outward and upward at right angles to the runway centerline, and the runway centerline is extended at a slope of 7 to 1 from the sides of the primary surface and from the sides of the approach surfaces. Transitional surfaces for those portions of the precision approach surface, which project through and beyond the limits of the conical surface, extend a distance of 5,000 feet measured horizontally from the edge of the approach surface and at right angles to the runway centerline.

**transponder**: A special onboard 1,090 MHz radio transmitter to enhance and code an aircraft's radar return. When interrogated by ground radar, it transmits a return signal that controllers can use to identify and tag the flight on their computerized video display radar screen. Paired with an altitude encoder, Mode C transponders also transmit the aircraft's altitude. All aircraft flying in Class B airspace or higher than 10,000 feet are required to have Mode C transponders.

**transportation network company (TNC)**: A company that uses an online platform to connect passengers with drivers using their personal, noncommercial vehicles.

**Transportation Research Board (TRB)**: Part of the nonprofit National Academies of Sciences, Engineering, and Medicine; provides leadership in transportation innovation and progress through research and information exchange.

**Transportation Security Administration (TSA)**: An agency of the U.S. Department of Homeland Security responsible for protecting the U.S. transportation systems and the traveling public.

**Transportation security regulations**: Regulations issued by the Transportation Security Administration in 49 CFR Parts 1500 to 1699.

**triple net lease**: A lease in which the lessee pays rent to the lessor as well as all taxes, insurance and maintenance expenses that arise from the use of the property.

**true heading**: Heading of the aircraft relative to true north.

**turbojet aircraft**: An aircraft having a jet engine in which the energy of the jet operates a turbine that in turn operates the air compressor.

**turboprop aircraft**: An aircraft having a jet engine in which the energy of the jet operates a turbine that drives the propeller. Such aircraft can be single-engine or multiengine.

**Twitter**: A free social networking service that allows registered members to broadcast short posts called "tweets." Twitter members can broadcast tweets and follow other users' tweets by using multiple platforms and devices. Tweets and replies to tweets can be sent by cell phone app, desktop client or posting on the Twitter.com website.

## U

**ultralight vehicle**: An aeronautical vehicle operated for sport or recreational purposes that does not require FAA registration, an airworthiness certificate or pilot certification. Primarily a single-occupant vehicle, although some two-place vehicles are authorized for training purposes. Operation in certain airspace requires authorization from air traffic control.

**uncontrolled airport**: (See nontowered airport).

**undue burden**: Significant difficulty or expense.

**UNICOM**: A common, multipurpose radio frequency used at most nontowered airports as the common traffic advisory frequency. The Aircraft Owners and Pilots Association coined the term (derived from the words "universal communications") in the 1950s. UNICOM is also used

by a fixed-base operator for general administrative uses, including fuel orders, parking instructions, etc. Originally 122.8 MHz universally, it now includes 122.7, 123.0 and other frequencies.

**unmanned aerial vehicle (UAV)**: Also known as a drone or unmanned aircraft system, an aircraft without a human pilot aboard. The flight of UAVs may operate either under remote control by a human operator, or fully or intermittently autonomously, by onboard computers.

**unmanned aircraft**: An aircraft operated without the possibility of direct human intervention from within or on the aircraft.

**unmanned aircraft system(s) (UAS)**: An unmanned aircraft and its associated elements, including communication links and control components that are required for the safe and efficient operation of the unmanned aircraft in the National Airspace System.

**unscheduled operation**: Any common carriage passenger-carrying operation for compensation or hire, using aircraft designed for at least 31 passenger seats, conducted by an air carrier for which the departure time, departure location and arrival location are specifically negotiated with the customer or the customer's representative.

**urban growth management (UGM)**: The identification and management of the demands on municipal facilities, improvements or services created by any proposed residential, commercial, industrial or other type of development. UGM is intended to (1) provide the means for satisfying such demands; (2) identify any harmful effects of development; and (3) protect the jurisdictions and their residents against such harmful effects by minimizing the costs of municipal facilities, improvements and services. The intent of UGM is usually not to prevent development or growth, but rather to avoid free or disorganized development or growth in the UGM area, which is generally located in and around the fringe of an urban area. The UGM area is usually either relatively undeveloped or predominantly agricultural and lacks most, if not all, municipal facilities, improvements or services.

**U.S. Customs and Border Protection (CBP)**: A federal law enforcement agency that regulates and facilitates international trade, collecting import duties and enforcing U.S. regulations, including trade, customs and immigration.

**use of premises**: The use of premises portion of the lease document specifically states what activities can and cannot be performed within the leasehold.

**user-fee airports (UFA)**: Small airports approved by a commissioner of the U.S. Customs and Border Protection to receive, for a fee, the service of a U.S. Customs and Border Protection officer for the processing of aircraft, their passengers and cargo entering the United States.

**U.S. terminal instrument procedures (TERPS)**: Procedures for instrument approach and departure of aircraft to and from civil and military airports, defined by FAA Order 8260.3.

**utility airport**: An airport designed, constructed and maintained to serve airplanes having approach speeds less than 121 knots.

## V

**vehicle gate**: Vehicle gates can be as straightforward as single- or double-swing, manually operated or electrically operated.

**vertical guidance surface (VGS)**: An imaginary 30:1 trapezoidal surface applicable to approaches with vertical guidance, extending from the runway threshold along the runway centerline to 10,000 feet from the runway end. Formerly referred to as glide path qualification surface (GQS).

**very light jets (VLJs)**: Jet aircraft with a maximum takeoff weight of 10,000 pounds, certified for single-pilot operations, equipped with advanced avionic systems and priced below other business jets.

**very high frequency (VHF) omnidirectional range (VOR)**: A type of radio beacon on which a tried-and-tested radio navigation system is largely based. It broadcasts 360 radial signals like spokes in a wheel; equipment on the aircraft determines which of these radials the aircraft is on to provide direction to and from an airport or given location.

**Victor airway**: A control area, or portion thereof, established in the form of a corridor, the centerline of which is defined by very high frequency omnidirectional range.

**visibility**: The ability, as determined by atmospheric conditions and expressed in units of distance, to see and identify prominent unlighted objects by day and prominent lighted objects by night. Visibility is reported as statute miles, hundreds of feet or meters.

- *flight visibility*: The average forward horizontal distance, from the cockpit of an aircraft in flight, at which prominent unlighted objects may be seen and identified by day and prominent lighted objects may be seen and identified by night.
- *ground visibility*: Prevailing horizontal visibility near the earth's surface, as reported by the National Weather Service or an accredited observer.

**visual approach**: An approach to an airport wherein an aircraft on an instrument flight rules flight plan, operating in visual flight rules conditions under the control of a radar facility and having an air traffic control authorization, may deviate from the prescribed instrument approach procedure and proceed to the airport of destination, served by an operational control tower, by visual reference to the surface.

**visual approach slope indicator (VASI)**: A system of lights arranged to provide visual descent guidance information during the approach to a runway (see also precision approach path indicator).

**visual area surface**: The 20:1 visual area surface is defined within Section 3.3.2.c of FAA Order 8260.3D: United States Standard for Terminal Instrument Procedures. The surface has a vertical slope of 20:1, extending from the runway's threshold elevation to the decision altitude of the specific approach. It begins 200 feet prior to the runway threshold and is intended to protect aircraft during the last stages of an approach, which follows the transition from instruments to visual guidance.

**visual flight rules (VFR)**: A defined set of FAA regulations covering the operation of aircraft, primarily by visual reference to the horizon (for aircraft control) and see-and-avoid procedures (for traffic separation). VFR weather minimums for controlled airspace require at least a 1,000-foot ceiling and 3 miles of visibility, except for "special VFR" clearances to operate "clear of clouds."

- *marginal VFR*—Weather of less than a 3,000-foot ceiling and 5 miles of visibility, but above the required "1,000 and three" (see instrument flight rules).

**visual line of sight**: Unaided (corrective lenses and/or sunglasses exempted) visual contact between a pilot in command or a visual observer and an unmanned aircraft system, sufficient to maintain safe operational control of the aircraft, know its location and be able to scan the airspace in which it is operating, to see and avoid other air traffic or objects aloft or on the ground.

**visual observer**: A person designated by the remote pilot in command to help him or her and the person manipulating the flight controls of the small unmanned aircraft system to see and avoid other air traffic or objects aloft or on the ground.

**visual runway**: A runway intended solely for the operation of aircraft using visual approach procedures, with no straight-in instrument approach procedure and no instrument designation indicated on an FAA-approved airport layout plan.

**Voluntary Airport Low Emissions Program (VALE)**: FAA grants available to commercial service airports in nonattainment or maintenance areas for National Ambient Air Quality Standards for eligible project types, including mobile and stationary equipment that reduce on-airport emissions.

**VORTAC**: Co-location of very high frequency (VHF) omnidirectional range (VOR) and ultra high frequency (UHF) tactical air navigation aid (TACAN) providing distance and bearing to a station; a basic guidance mode, providing lateral guidance to a set of a VOR station and a TACAN station that are co-located.

## W

**wake turbulence**: Turbulent air condition caused by small, tornado-like horizontal whirlwinds trailing an aircraft's wingtips (wingtip vortices). Wake turbulence associated with larger aircraft flying at slow speeds (as on takeoff or landing approach) is the most severe and can cause loss of control for smaller aircraft following close behind. Controllers use defined separation standards to avoid the problem for takeoff, landing, approach and departure operations. The term includes vortices, thrust stream turbulence, jet blast, jet wash, propeller wash and rotor wash, on the ground and in the air.

**wastewater treatment facility**: Any devices or systems used to store, treat, recycle or reclaim municipal sewage or liquid industrial wastes.

**Wide Area Augmentation System (WAAS)**: An enhancement to the global positioning system (GPS) providing greater navigation accuracy and system integrity and permitting GPS to be used for precision instrument approaches to most airports.

**wildlife**: Any wild animal, including without limitation any wild mammal, bird, reptile, fish, amphibian, mollusk, crustacean, arthropod, coelenterate or other invertebrate, including any part, product, egg or offspring thereof.

**wildlife attractants**: Any human-made structure, land-use practice or human-made or natural geographic feature that can attract or sustain hazardous wildlife within the landing or departure airspace, apron areas or aircraft parking areas of an airport.

**wildlife control personnel**: Airport personnel trained and equipped to respond to wildlife hazards on the airfield.

**wildlife hazard**: A potential for a damaging aircraft collision with wildlife on or near an airport.

**wildlife hazard assessment (WHA)**: An evaluation of wildlife-related attractants and potential hazards to aircraft operations, often mandated by the FAA following a hazardous event or new potential threat.

**wildlife hazard management plan (WHMP)**: A document that identifies measures to alleviate or eliminate wildlife hazards, as identified in a wildlife hazard assessment.

**wildlife hazard site visit (WHSV)**: A truncated version of a wildlife hazard assessment, conducted over a shorter period of time to determine if more extensive study is required per FAA guidelines.

**wildlife hazard working group (WHWG)**: A committee formed to monitor and implement the wildlife hazard management plan and program.

**wildlife strike**: A wildlife strike has occurred when

- A pilot reports striking one or more birds or other wildlife;
- Aircraft maintenance personnel identify aircraft damage as having been caused by a wildlife strike;
- Personnel on the ground report seeing an aircraft strike one or more birds or other wildlife;
- Bird or other wildlife remains, whether in whole or in part, are found within 200 feet of a runway centerline, unless another reason for the animal's death is identified; or
- The animal's presence on the airport had a significant negative effect on a flight, i.e., aborted takeoff, aborted landing, high-speed emergency stop, or aircraft left pavement area to avoid collision with animal.

**windrow**: A long line of piled snow.

**wind shear**: Large changes in either wind speed or direction at different altitudes that can cause sudden gain or loss of airspeed. Wind shear is especially hazardous when aircraft airspeeds are low on takeoff or landing.

**wingspan**: The maximum horizontal distance from one wingtip to the other wingtip, including the horizontal component of any extensions, such as winglets or raked wingtips.

**written re-evaluation**: Documentation of the validity of a previously prepared environmental assessment or environmental impact statement. If substantial changes are found, a supplement to the previously prepared environmental assessment or environmental impact statement may be required.

## Z

**zero-based budget**: Budget line items from the prior year are zeroed out, and the new line-item budget is built from a zero baseline; used primarily to set up the airport's operating budget.

**zoning**: (See zoning ordinances)

**zoning ordinances**: Ordinances that divide a community into zones or districts, according to the present and potential use of properties, for the purpose of controlling and directing the use and development of those properties.

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*Abbreviations and acronyms used without definitions in TRB publications:*

| | |
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| A4A | Airlines for America |
| AAAE | American Association of Airport Executives |
| AASHO | American Association of State Highway Officials |
| AASHTO | American Association of State Highway and Transportation Officials |
| ACI–NA | Airports Council International–North America |
| ACRP | Airport Cooperative Research Program |
| ADA | Americans with Disabilities Act |
| APTA | American Public Transportation Association |
| ASCE | American Society of Civil Engineers |
| ASME | American Society of Mechanical Engineers |
| ASTM | American Society for Testing and Materials |
| ATA | American Trucking Associations |
| CTAA | Community Transportation Association of America |
| CTBSSP | Commercial Truck and Bus Safety Synthesis Program |
| DHS | Department of Homeland Security |
| DOE | Department of Energy |
| EPA | Environmental Protection Agency |
| FAA | Federal Aviation Administration |
| FAST | Fixing America's Surface Transportation Act (2015) |
| FHWA | Federal Highway Administration |
| FMCSA | Federal Motor Carrier Safety Administration |
| FRA | Federal Railroad Administration |
| FTA | Federal Transit Administration |
| HMCRP | Hazardous Materials Cooperative Research Program |
| IEEE | Institute of Electrical and Electronics Engineers |
| ISTEA | Intermodal Surface Transportation Efficiency Act of 1991 |
| ITE | Institute of Transportation Engineers |
| MAP-21 | Moving Ahead for Progress in the 21st Century Act (2012) |
| NASA | National Aeronautics and Space Administration |
| NASAO | National Association of State Aviation Officials |
| NCFRP | National Cooperative Freight Research Program |
| NCHRP | National Cooperative Highway Research Program |
| NHTSA | National Highway Traffic Safety Administration |
| NTSB | National Transportation Safety Board |
| PHMSA | Pipeline and Hazardous Materials Safety Administration |
| RITA | Research and Innovative Technology Administration |
| SAE | Society of Automotive Engineers |
| SAFETEA-LU | Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (2005) |
| TCRP | Transit Cooperative Research Program |
| TDC | Transit Development Corporation |
| TEA-21 | Transportation Equity Act for the 21st Century (1998) |
| TRB | Transportation Research Board |
| TSA | Transportation Security Administration |
| U.S. DOT | United States Department of Transportation |

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