Management and Operational Factors Used to Develop Aero Valley Airport's Policies and Procedures

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I.   INTRODUCTION

In the grand scheme of general aviation airports, Aero Valley Airport (52F) is considered a small basic airport. Despite its high daily operation rate and renaming it Northwest Regional, it is not a regional airport as defined by any aviation authority. This fact, among others, caused a majority of property owners to return the airport's name to Aero Valley. Regardless of whether the name Aero Valley sticks or whether a new majority prefers another name (Edna Whyte Memorial?), the Board must ensure that the name does not misrepresent the airport's status.

Under FAA general aviation airport categories, a regional airport supports regional economies by connecting communities to statewide and interstate markets with scheduled and non-scheduled passenger air transportation services. Aero Valley currently has no ability to support either scheduled or non-scheduled passenger operations. Therefore, it is not a regional airport.

According to these same FAA categories, Aero Valley is a basic airport. Basic airports link the community with the national airport system and support general aviation activities such as emergency services, charter or critical passenger service, cargo operations, flight training, and personal flying. Aero Valley currently supports only flight training and personal flying. Flight training takes place in a limited sense due to poor infrastructure and degraded or non-existent flight service facilities. Reversing the airport's degradation and returning it to a respectable aviation facility should be at the top of the Board's priority list.

Local conditions and expectations determine 52F's management needs. FAA data show that 52F handles about 450 operations per day. In addition to high-volume flight operations, what was once a sleepy hollow is now experiencing an intense development boom. Effective airport management requires considering not only the number of local operations but also the explosive growth in North Texas. Aero Valley's board of directors should recognize the function and role of airport management systems considering the challenges associated with explosive growth as well as the many opportunities such growth can bring.

The Board must have a clear vision of the airport's desired character and direct management accordingly. Does the picture of the entrance to 52F's office reflect the Board's vision? Probably not. Board members and property owners alike have a much higher expectation.

Small airport managers are responsible for a broad range of activities and interact daily with a variety of stakeholders. They operate under fiscally constrained circumstances that require maximizing scarce resources and utilizing a diverse range of skills to perform needed functions. The situation at 52F is particularly demanding because the airport is going through the most dramatic transition it has ever experienced in its 50-year history. It is also recovering from decades of strife and neglect. Recovery will not happen overnight. How recovery will manifest itself will be guided entirely by a clear

vision of the airport's desired character and its role in our community. Only then can the board create a credible plan to bring that vision to fruition. Establishing that vision should be the Board's highest priority task.

Aero Valley is well suited to follow the majority with airport management provided by an airport manager. According to the *Guidebook for Managing Small Airports*, 73% of small airports employ an airport manager to manage the airport while an FBO serves as the airport manager in 13% of small airports. The remainder are managed by a variety of people, including an Airport Commission, Public Works Director, Other, or, in 3% of the airports, the airport is unattended.[1] During 52F's transition phase, the Board must ensure that the airport manager is highly energized, proactive, and competent to turn the Board's vision into reality.

II.   AIRPORT ORGANIZATION

A.   Governance

Property owners re-established their authority to govern and operate 52F after taking two decisive actions. First, property owners within the airport's original boundaries (i.e., those outside the Northwest Development) reactivated the airports original governing body, the Architectural Control Committee ("ACC"), and delegated its duties to the board of directors of the Aero Valley Property Owners Association ("POA"). Second, Northwest Development property owners re-amended their deed restrictions to designate the POA's board of directors as the governing body in that development area. Therefore, the POA now has a legal duty to govern, manage, and operate Aero Valley Airport for the benefit of all property owners within airport boundaries. This is no small task.

The Board of Directors ("Board") is directly responsible for maintaining the infrastructure required to operate a public-use airport and support over 300 airport properties with a present market value of over $50 million. To meet these fiduciary obligations, the Board must ensure competence in all aspects of airport operations, but especially in its ability to gain and keep the trust of the property owners it represents. The Board must recognize that cash flow is the life blood of the organization and is key to the airport's survival. Therefore, the accounting practices and systems it maintains play a vital role in the airport's success. We must operate without error at the highest levels of efficiency and integrity.

Finally, because the Board currently consists of volunteers, the systems we establish must be automated to the greatest extent possible with duties delegated appropriately such that all financial and critical operational matters will be handled in a timely and competent manner regardless of any Board member's availability. With these systems in place, the Board can fulfill its role of establishing the policies and procedures that will allow it to serve as the strategic advisor while subject matter experts handle daily activities as their primary job, all of which must be paid positions.

A long list of factors must be considered when establishing management policies and procedures. Exactly what that management looks like depends on how well we integrate our

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[1] *Guidebook for Managing Small Airports*, Airport Cooperative Research Program, The National Academies Press, Washington, D.C., 2009.

specific circumstances with the general principles that follow. I have pulled this information from a variety of sources. This is a rare opportunity. Let's get it right.

Function and Roles of Airport Managers

An airport manager is typically responsible for daily airport operations. The airport manager directs, coordinates, and reviews all aircraft operations, maintenance of the airfield and buildings, community relations, and financial matters of the airport. Some airport managers are also responsible for running the airport's FBOs under a separate agreement.

No matter what specific duties an airport manager has each day, the number one responsibility is to operate a safe and efficient airport. The airport manager also plays a vital role in fulfilling the Board's objectives of establishing an enjoyable and sustainable aviation facility.

An airport manager reports to, and receives direction from, the Board. The manager is also responsible for interpreting the functions and activities of the airport to the public. Public relations, therefore, is one of the most important functions of airport management.

Airport management is a complex process of effectively directing resources toward the accomplishment of the airport's goals. Central to achieving these goals is the ability of the Board to administer the basic functions of management including planning, organizing, staffing, leading, and controlling.

The position of airport manager has often been described as a "jack-of-all-trades." Serving as a successful airport manager requires a variety of skills to accomplish the managerial functions. NAS researchers identified the following principles and techniques that were crucial to small airport management:

- **Quality Management.** Airport managers must focus on meeting the needs of the public and airport customers. Airport staff must be provided training, tools, and resources to maintain high-quality facilities and services.

- **Team-Based Management Techniques.** Small airport managers can be overwhelmed with the varying tasks involved with the position and with leading staff, if any, toward meeting the airport goals. The Board can maximize resources available to managers through industry organizations, state and federal units of government, consultants, and other airport-related networks.

- **Consistency and Standardized Methods of Operation.** It is important for airport managers to strive for consistent enforcement of airport rules, standards, and policies. A standard method of operation establishes the means for ensuring organized growth and property owner/tenant satisfaction.

- **Communication Tools and Strategies.** Communication is integral to the success of the airport as an organization. Airport managers must communicate with property owners, governmental entities, customers, tenants, regulatory agents, commissions, boards, and the general public.

- **Coordination.** Proper coordination among public entities; federal, state, and local units of government; and airport tenants is integral to the success of the airport. Coordination is essential for orderly construction and development of the airport facility and to move forward with the airport's objectives.

- **Building Public Goodwill.** Public relations is vital to the success of any small airport. Airport managers must implement a wide variety of marketing strategies aimed at maintaining a positive perception of the facility and for building community relations.

- **Strategic Planning and Coordination.** An airport needs an organizational vision, mission, goals, objectives, and direction. This is an essential function of airport management and is vital to the ongoing assessment of the airport's role in the community.

- **Fiscal Responsibility.** Fiscal responsibility is a critical component of airport administration involving the budgeting and expenditure of public and private funds. It is important to understand the financial position of the airport and communicate the economic impact of the facility.

- **Legal Responsibility.** The Board is responsible for legal policies and ordinances of the community and for mandated responsibilities such as EPA guidelines.

- **Environmental Stewardship.** It is important for an airport to be a good community "neighbor" regarding environmental issues such as stormwater pollution, noise, and land use.

- **Public Safety.** Programs and policies must be implemented to ensure the safety of both the aviation public and non-flying public.

Communication and Coordination

Communication and coordination with the board of directors is one of the airport manager's key roles. The manager serves as the airport's representative on site and to the public at large. The Board assigns the manager's responsibilities, and the manager reports back to them. A good working relationship is required for smooth operations.

Typically, the manager performs the day-to-day functions as necessary to maintain efficient operations. In doing so, it is the manager's responsibility to keep board members informed of activities that may reflect upon them.

The airport manager may also benefit from advocating for the airport at the state or national level. To advocate for an airport at this level, it helps to know the role of state legislative committees, how the legislature is structured, strategies for communicating with local boards and commissions, and how to package requests effectively.

At the state level, typical committees with jurisdiction over airport issues are the transportation policy, transportation finance, and state and local government operations committees. A primary goal of any advocate is to get noticed and get his or her message out to policy makers, whether at the local, state, or federal level.

One strategy is to quantify needs and costs and make this quantification known to policy makers. In addition, the airport manager should explain why airports are important and why policy makers should care about their health and future. Finally, the airport manager should get to know policy makers before needing them. He or she should know who represents the airport at all levels, and then work on building a relationship with them. The time immediately following elections is a good time to contact lawmakers since they are not as busy then.

III.   AIRPORT FINANCE

A.   Finance

Budget Development

An essential function of airport management is to successfully develop and implement an airport budget. Proper planning and allocation of financial resources for both short-term and long-term needs is an important part of the financial management of the airport. Budgets essentially plan the dollar amounts required to operate and maintain the facility for defined periods of time. Every airport, as any business operation, must develop an operating budget for the short term, which is typically one to two fiscal-year periods. Coordinated long-term planning is needed to determine capital expenditures such as runway construction, land acquisition, or major equipment purchases.

There are many types and formats of budgets an airport can use. Forms of budgeting vary and may depend on the style adopted by a larger governmental entity such as a city, which typically follows a line-item budget, program budget, or activity budget format. This guide will not attempt to cover in great detail the various theories and appropriation methods associated with budgeting. Rather, this section is meant to give the airport manager a general overview of the small airport budget process and a working knowledge of the application of that process.

B.   Revenue Generation

Income Sources

Airport operations budgets are normally prepared for a one-year fiscal period. This budget shows the basic operating expenses and revenues of the airport and includes financial estimates on personnel costs, operating expenses, supply expenses, and other planned services. Most governmental entities compete with each other for public funds. In most cases, the goal is not necessarily to create a profit but to ensure that financial resources are available to operate the facility safely and efficiently as a component of the public infrastructure. The airport manager must assess the fiscal requirements to both keep the lights on and responsibly protect public welfare. In many cases, simply balancing the budget is the goal.

The amount of revenue generated at a small general aviation airport is typically small and is often supplemented with intergovernmental aid. Income sources normally attributed to the operation of the airport include:

- Commercial land leases and rents,
- T-hangar lease agreements,
- Private hangar land lease,
- Agricultural land lease,
- Terminal concession rents,
- Fuel flowage fees, and
- Landing and ramp fees.

Local government tax subsidy is often required to offset the gap between budgeted revenues and expenses. Innovative airport managers have also developed programs to generate non-standard airport revenues through special rentals, billboards, or direct fueling of aircraft. Each airport is unique and may have attributes such as a geographic location that lends itself to possibilities such as scenic flights for hire. Other supplemental revenues may come from sources such as investments, sale of surplus equipment or property, or utilities. These income sources may vary widely between airports.

The goal of revenue generation should be to provide for an economically self-sustaining airport operation. Most general aviation airports do, however, require some form of tax subsidy to operate. In some cases, the governmental structure of the airport provides for its own taxing authority. This structure, or airport authority, operates somewhat more autonomously than the typical small general aviation airport. In other cases, it may be possible to operate the airport as an enterprise fund that is financially self-supportive through revenues generated in the department or organization. This overview will not attempt to differentiate between the varying airport structures for the purpose of describing the financial management process.

In preparing an airport operating budget it is usually easier to anticipate airport revenues as opposed to airport expenses. Revenues are generally tied to certain operating or rental agreements and are therefore more clearly defined. The next section will discuss the expenditure component of the airport operating budget.

a)   Expenses

Determining small airport expenses depends on many factors. The structure of an airport operation within a municipal organization varies, and many actual expenses are difficult to measure. For example, equipment operators or trade personnel labor costs at the airport may be hidden within another department budget. Therefore, the actual labor costs of the organization may not be reflected in the airport operations budget. Typically, the airport manager will organize and prepare a budget within the accepted budgeting methods for the municipal organization. This budgeting normally involves anticipating expenses for both operating and non-operating expenses.

Operating expenses are all of those costs associated with the actual operation of the airport. These costs may include labor, supplies, utility, and maintenance costs that are incurred on a day-to-day basis. These costs will vary considerably according to geographic region and the structure of the airport. For example, maintenance and equipment expenses may be significantly less in warmer areas of the country as opposed to those areas that require snow removal. Another example is the cost of maintaining an asphalt slab, which increases as it ages and varies due to weather and usage.

The accounting of non-operational expenses also depends on the position of the airport within an organization. The airport manager must consider these costs—which may include equipment depreciation and debt service on existing airport financial obligations.

b)   Economic Impact of an Airport

Most airports must justify their improvement projects to their city council, county board members, airport authority, or other governing bodies. Economic impacts are measured by the economic activity, earnings, and jobs generated by the airport activity or because the airport exists. Economic impact generated by a local airport can be either direct or indirect. In addition, an

airport may generate multiplier impacts, which include money spent at or for the airport that flows through the regional economy.

C. Leasing and Use Agreements

An airport manager must be familiar with the many types of airport leasing and use agreements used at small airports. Airport leases may be considered commercial use agreements or non-commercial use agreements. An array of other leases may be present at an airport facility, depending on the nature of the operation considered, such as agricultural operations or other non-aviation–type uses.

It is important that an airport manager work toward consistency in the application and enforcement of lease administration and policy. This consistency is particularly important for operators of airports with commercial use agreements. Airport sponsors of federally obligated airports (see "Compliance with Grant Conditions" in this chapter) must also ensure that certain grant obligations are being met with regard to airport leasing policy. This guidebook will provide a basic overview of several components to successful lease administration at a small airport.

Further research is being conducted in this area. The ACRP funded ACRP Project 01-02, "Guidebook for Developing and Managing Airport Contracts," and ACRP Project 01-08, "Guidebook on Best Management Practices for Leasing and Developing Airport Property." The reports from ACRP 01-02 and ACRP 01-08 are expected to be published in 2009 and 2010, respectively. For a list of ongoing ACRP projects relevant to managers of small airports, please refer to the appendix.

Minimum Standards

Owners of public-use airports routinely allow businesses to conduct commercial operations and other aeronautical activities from the airport. Commercial operators normally enter into a lease agreement or contractual arrangement with the Board allowing for the commercial operation or operations contemplated by the operator. It is essential that an airport manager develop reasonable criteria for the accommodation of commercial aeronautical services on an airport. The FAA encourages operators of public-use airports to develop such criteria in the development of minimum standards.

Airport sponsors must agree to make the opportunity to engage in commercial aeronautical activities available to any person, firm, or corporation that meets reasonable minimum standards established by the airport sponsor. The FAA suggests that airport sponsors establish reasonable minimum standards that are relevant to the proposed aeronautical activity (*4*).

The FAA suggests further in Advisory Circular (AC) 150/5190-5 that the objective of developing minimum standards is to promote safety in all airport activities, maintain a higher quality of service for airport users, protect the public from unlicensed and unauthorized products or services, enhance the availability of adequate services for all airport users, and promote the orderly development of airport land (*4*).

Minimum standards are also implemented to ensure that each like operator is meeting the same basic standards and that no one operator is given an advantage over others by the airport. Airports that have accepted federal funds agree to allow commercial entities the opportunity to engage in commercial aeronautical activities subject to meeting reasonable minimum standards established by the airport.

Every airport is unique and in developing minimum standards the airport manager must attempt to draft a set of standards tailored to that particular airport. Careful consideration must be given to the specific conditions at an airport. Use of "boilerplate" standards may not be effective and may lead to unreasonable standards.

Each airport should consider a variety of factors when establishing minimum standards. A detailed examination of the particular nature of anticipated commercial activities and the operating environment at the airport is required. In FAA AC 150/5190-5, the FAA suggests that the following factors be considered:

1. What type of airport is at issue? Is it a large airport or a small rural airport? Will that airport provide service to only small general aviation aircraft or will it serve air taxi operators as well?

2. What types of aeronautical activities will be conducted on the airport? Is there a demand for the business?

3. How much space will be required for each type of aeronautical activity that may prospectively operate at the airport?

4. What type of documentation will business applicants be required to present as evidence of financial stability and good credit?

5. To what extent will each different type of aeronautical activity be required to demonstrate to the sponsor compliance with sanitation, health, and safety codes?

6. What requirements will be imposed regarding minimum insurance coverage and indemnity provisions?

7. Is each minimum standard relevant to the aeronautical activity for which it was designed to apply? For example, the minimum space required for a repair station might not be relevant to an air taxi operation. Avoid unreasonable standards by selecting elements that accurately reflect the nature of the aeronautical activity in question.

Minimum standards should be developed to establish an actual set of requirements to accommodate a range of commercial activities. Commercial aeronautical activities may include such aeronautical activities as aircraft maintenance, fueling, charter, flight training, sales, rental, and parts.

Entities authorized to provide commercial aeronautical services at an airport are commonly referred to as FBOs. Many FBOs offer a full range of commercial services. In other cases, specialized aviation service operators will apply to provide only a single or limited aeronautical service. Care should be taken to develop reasonable, relevant, and applicable standards for each type and class of service. For example, a space requirement for a specialized service such as avionics repair that is the same as for a full-service FBO may not be reasonable.

Because airports are always changing and growing, minimum standards should be flexible to allow for changing conditions in the airport environment. Minimum standards should be somewhat dynamic and reviewed by airport management periodically. Care should be taken to not adopt standards merely to accommodate a single operator or to establish unreasonable criteria that may lead to a service monopoly. It is incumbent upon an airport manager to use consistency in the enforcement and application of standards. This consistency will also reduce

potential conflict and promote the orderly development of the airport by "leveling the playing field." Airport

D. Liability and Insurance

The Board should ensure that the airport is protected with adequate airport liability insurance coverage. Airports and their tenants have the same general type and degree of liability exposure as the operator of most public premises. Principal areas in which claims may arise include aircraft operations, premises operations, and sale of products.

Basic types of insurance coverage include:

- Basic Airport Premises Liability—covering losses arising out of liability for activities conducted on the airport (purchased by the Board);

- Products Liability/Completed Operation Liability—covering losses arising out of claims related to the sale of products or completed services (purchased by the service operator); and

- Hangar Keepers Coverage—covering aircraft damage while in the care, custody, or control for storage or safekeeping (purchased by the hangar or aircraft owner).

Other types of coverage include liability insurance for airport events or personal and advertising injury liability.

The Board should ensure that satisfactory insurance requirements are contained within the various lease agreements at the airport. Important considerations in the preparation of leases are provisions for indemnification and workers' compensation. It is recommended that airport lease policy with respect to insurance requirements provide that the Board is named as additionally insured.

Airport managers should review lease insurance requirements periodically with their insurance providers, risk managers, and attorneys.

Capital Improvement Programming and Cash Management

Cash management and coordination of cash flow is an important element in airport development. Because the POA can be required to pay out a significant amount of cash prior to being reimbursed, the Board of Directors should coordinate contractor and consultant pay requests with the state and the FAA (if applicable).

To illustrate the cash flow considerations, typical funding, projected costs, and cash flow for an example project are discussed in the following paragraphs. In the example airport development project, the funding is obtained from federal and state grants with the following restrictions:

- Federal grant

  – Bid prices must be provided with the grant application;

  – 90% of eligible costs are reimbursed; and

  – 10% of eligible costs are paid by local owner.

- State grant

– Design services can be funded by the grant;

– 60% of eligible costs are reimbursed; and

– 40% of eligible costs are paid by local owner.

The Board may seek federal reimbursement for design after the project is bid.

IV.   AIRPORT OPERATIONS

A.   Safety

In the survey conducted for this guide, the majority of airport managers cited wildlife as their most significant safety threat, followed closely by theft, accidental aircraft incursions by the public, and vandalism. Airport security is a priority for 70% of the survey respondents. The survey showed that most airports have signage, fencing, and security plans and that many airport managers would like closed circuit television screens and card reader security gates. Figure 3 shows what practices survey respondents are employing to increase airport safety.

Other safety preferred practices noted by survey respondents include:

• Full-perimeter security fencing, with daily perimeter inspections;

• Controlled access (allowing only airport and FAA employees on the airfield);

• Random patrol by local police for additional security; and

• Coded electronic gates for vehicle access.

Safety is clearly an issue for airport managers across the United States.

Public Protection Awareness

It is the Board's responsibility to undertake every effort to protect the public from hazards that may exist in the airport environment. The general public visiting the airport should be clearly reminded of these hazards and generally not given access to the airfield unless under supervision.

Safeguards to prevent inadvertent entry to the airfield and protection from aircraft blast can be provided through fencing, signage, public announcements, and proactive maintenance. Emphasis should be placed in areas of common use such as parking lots, sidewalks, terminals, and FBO facilities. Routine maintenance tasks, construction, and weather are common factors that may lead to additional hazards.

Airfield Signs, Fencing, and Lighting

Aircraft movement areas—including, but not limited to, runways, taxiways, ramps, and hangar access routes—present an obvious and important hazard to the general public unfamiliar with the operating procedures in these areas. Unauthorized vehicles, pedestrians, bicyclists, and pets are concerns that need to be addressed. A common method to prevent inadvertent access is to erect fencing and gates to define the area. In addition, airport property "no trespassing" signs provide awareness of the airport environment and security procedures that may be in place. Such signs should be placed every 200 feet, at each access point, and on each fence corner. Well-lighted parking lots, sidewalks, and additional pedestrian areas will help improve visibility

hazards and provide a certain level of deterrence for unwanted activities. The FAA regulations for airport markings,

Aircraft Fueling

Aircraft fueling at smaller airports may be provided by the Board or an airport operator such as an FBO. Regardless of who owns and operates the fueling operation, it is the ultimate responsibility of the Board to ensure the fueling systems are well maintained and the services are provided safely. Aircraft fueling presents two major concerns: storage and handling of hazardous materials and fire safety. When establishing proper airport fueling operation procedures, the airport manager should include at a minimum the following two sources: the latest edition of the National Fire Protection Association (NFPA) 407, *Standard for Aircraft Fuel Servicing,* available at the NFPA website (www.nfpa.org/catalog) and the latest edition of FAA AC 150/5230-4, *Aircraft Fuel Storage, Handling and Dispensing on Airports,* available at the FAA website (www.faa.gov/airports_airtraffic/airports/resources/advisory_circulars).

It is imperative that the fueling operator establish and provide initial and recurrent employee training. Although only FAR Part 139–certificated airports are required to use them, the FAA maintains a list of approved agencies that provide fuel safety training programs. These agencies may provide the resources needed to establish a professional training program. Such programs should include at a minimum aircraft familiarization, aircraft towing, product (fuel) recognition, bonding, testing, inspections, and fire safety training.

To ensure safe and efficient fueling operations, a routine equipment inspection program should be established, combined with timely maintenance. Fueling systems generally include fuel farms (storage tanks) and fueling trucks. An increasing trend at smaller airports is the installation and operation of self-serve fuel systems. These systems provide efficiency and great customer service.

However, the Board's liability may increase if the system is not properly and routinely inspected. Providing clear user instructions and ensuring the system is well maintained and safe will reduce the airport's liability. An inspection checklist can be developed and include routine (daily), monthly, quarterly, and annual inspections and maintenance tasks. The checklist should be documented and kept on file for a minimum of one year.

Providing fire safety training is a large component of fueling operations. Initial and recurrent training should cover awareness, static control, extinguishing agents, and emergency procedures. Because local fire codes may vary, fire safety training and inspections should involve the local fire jurisdiction's personnel.

Notice to Airmen

The Notice to Airmen (NOTAM) system was established to provide timely information to aircraft operators to describe conditions on or around the airport that may affect aircraft operations.

Typically, a NOTAM is issued and canceled by the Board's airport manager designee or operator. (The FAA may also issue and cancel NOTAMs regarding certain circumstances, such as FAA-owned navigation aids and temporary flight restrictions.) The NOTAM is issued by calling the local flight service station (FSS) and identifying the airport affected, person issuing the NOTAM, and information establishing the NOTAM. The NOTAM is then disseminated by the FSS until canceled by the person or agency originating the NOTAM. Because the intent is to

disseminate critical information, procedures must be in place to notify local tenants and coordinate any updates as conditions change.

The NOTAM issuance procedure has been enhanced recently in many states because of a newer program supported by Lockheed Martin. The airport manager should contact state aeronautics offices or local FSS offices to verify the procedures for issuing a NOTAM.

A NOTAM log should be used to record the issuing date and time, NOTAM information, initials of the person issuing the NOTAM, and initials of the FSS individual receiving the information. The log should also include the cancellation date and time and initials of the individual canceling the NOTAM. The NOTAM log should be retained for event documentation and liability purposes. Further guidance on using the NOTAM system may be obtained from FAA AC 150/5200-28 (www.faa.gov/airports_airtraffic/airports/resources/advisory_circulars).

Airfield Data and Communications

Most small airports do not have an air traffic control tower and are therefore considered uncontrolled airports. Aircraft communications and airfield advisories are generated through a common traffic advisory frequency or UNICOM frequency by a local radio operator at the airport. Weather information is typically provided though an automated system on the airfield, such as an automated weather observation system or automated surface observation system. Such systems provide information on wind direction and intensity, visibility, barometric pressure, and precipitation.

Because these systems are so important, the Board ensures their correct operation by monitoring and reporting deficiencies to the proper maintenance personnel. In addition, a small airport may utilize a ground communications outlet or remote communications outlet. These communications facilities are unstaffed and enable a pilot to contact air traffic control or the FSS to obtain flight clearances, close flight plans, and obtain the weather.

Specific information about each airport is found in the FAA Airport Master Record—Form 5010-1 and the *U.S. Airport Facility Directory.* Each one contains the Board's contact information, runway data, communication frequencies, and remarks on potential airfield hazards. The FAA Airport Master Record also provides the number of based aircraft and annual aircraft operations. It is the Board's responsibility to ensure the information contained in these records is current. An airport's current Form 5010, and information on how to update Form 5010, are accessible through the FAA website (www.faa.gov).

Airfield Driving Programs

The Board is responsible for ensuring that access to the aircraft movement areas is limited to what is necessary for airport operations. The Board may achieve this through fencing and access barriers and, in addition, through airport rules and regulations defining who has access and to what extent. An airfield driving program should be established at each airport to ensure access control procedures and safe operations. The airfield driving program should be tailored to the individual groups using the airfield. Tenants and contractors will be limited to those areas necessary to perform their driving operations. Typically, these areas are only ramps, hangar access areas, and areas closed to normal aircraft operations. Airport employee and FAA personnel driving programs will normally include those previously mentioned areas as well as the aircraft movement areas. These programs will be more complex, involving runway markings and signs, airfield lighting, aircraft communications, and specific vehicle requirements. The driving

program should include a training session followed by a written test (documentation retained for individuals' files) and a behind-the-wheel road test to ensure proficiency. FAA AC 150/5210-20, *Ground Vehicle Operations on Airports,* provides guidance for developing ground vehicle operation training programs.

Airfield familiarization is the most important component of the airfield driving program. Anyone allowed access to aircraft movement areas needs to be assured of their surroundings and current conditions. The airport environment will look different at night and during low-visibility conditions. In addition, it is essential that the driving program includes vehicle/aircraft radio communication procedures.

An airfield driving program should also address the vehicles allowed on the airport, and more important, the aircraft movement areas. Vehicles should be well maintained; should be marked, painted, or lighted for high visibility; and should include working radios with the proper frequencies for communication. Additional information can be found in ACs on the FAA website (www.faa.gov/airports_airtraffic/airports/resources/advisory_circulars).

B.   Maintenance

Inspections and Surveillance

A safe and efficiently operated airport employs a successful maintenance program. This success begins with routine airport inspections and surveillance. The importance of routine inspections cannot be overstressed. If the airport is utilized on a daily basis, provisions should be made to inspect it on a daily basis. Such daily inspections are considered routine inspections. 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 recording on airfield lighting circuit performance. Special inspections include checking the airfield after an unusual condition such as an aircraft accident or meteorological event. A special inspection will ensure the pavements and safety areas are clear and airfield lighting systems are functioning correctly. In the survey conducted when developing this guidebook, one airport manager shared that he would walk the runway (with a Unicom radio) for a thorough inspection and for exercise!

Checklists should be developed and used during the inspections, with any discrepancies and corrective actions noted. The inspection logs should be filed and maintained to provide historical data and helpful evidence in the event airport maintenance is ever challenged in court.

Preventive Maintenance Programs

A proven and effective method to operate an efficient airport and reduce maintenance costs is to establish preventive maintenance programs. The adage "pay me now or pay me later" may definitely be applied to this topic. Spending a certain amount of time and money on airport systems each year will significantly reduce the need to spend larger amounts later and replace systems prematurely.

If an airport receives federal funding, it may be required to develop a pavement preventive maintenance program. Annual monitoring and recording is an important part of the preventive maintenance program. Pavement programs may include crack sealing, surface sealing, and partial- and full-depth repairs. Lighting programs may include replacing fixtures, wiring controls, and repainting fixtures. Measuring lighting circuit voltage and recording the numbers may

indicate the loss of electrical current requiring maintenance prior to system failure. Building structures and heating, cooling, and ventilation systems should be monitored and addressed as needed. The airport's vehicles and equipment also should be routinely checked and maintained to ensure safe and efficient operations.

Maintenance Equipment

Each airport should keep an inventory of current equipment and desired future equipment needed to maintain the airport property safely and efficiently. To obtain the equipment in a timely manner, it should be identified during the budgeting and capital improvement project (CIP) process. The high cost of some airport equipment will also require early planning and a financial plan. A revolving equipment schedule—which is an inventory of equipment listed by year and showing its replacement schedule based on age and use—can help in this planning process.

Because many airports are publicly owned and operated, most federal, state, and local regulations require the airport to purchase goods through a public advertising and bidding process. Some state agencies organize this process and receive bids for certain equipment and services. Publicly operated airports may then purchase from the state's established contract. In addition, airports may elect to bid for certain equipment and services themselves. The first step is to research the airport's specific needs and the optional equipment available. Visiting with equipment vendors and following up with references is a key step to this education process. It may be useful to use staff (and neighboring airport's) experience and opinions.

Assembling a set of bid documents and precise specifications is extremely important. Airport managers should devote adequate time to carefully review these documents prior to advertising. It is important to ensure the documents are written precisely but do not exclude vendors from the ability to participate. Bids are usually received sealed and opened at a public meeting. The award is generally given to the lowest-priced qualified bidder.

In addition, the survey conducted during the preparation of this guidebook suggested consideration of the following practices to improve equipment management: establish and maintain a preventive equipment maintenance program, hire, and maintain experienced personnel, acquire a single piece of equipment for multiple roles, and maintain an inventory of frequently needed parts to prevent long downtime repair periods. Cost-saving practices also mentioned included utilizing used equipment from local governments and participating in the Federal Surplus Property Program. More information about this program is available on the FAA website.

Record Keeping

The value of establishing written forms, logs, or checklists, documenting efforts, and maintaining organized files cannot be stressed enough. Record keeping should involve inspections, training, and maintenance efforts. It should also include special conditions such as significant weather events and accidents or incidents involving aircraft, vehicles, and people on the airport property. Proper record keeping may be used to prove the Board is proactive in management programs and may reduce potential liability if challenged in court. In addition, these records may be useful in determining cost of ownership and pre-existing factors for developing the budget for the next fiscal year. Records should be retained for a minimum of one year.

Airfield (Airside) Maintenance

An airfield inspection program should be established and include aircraft movement surfaces, safety areas, lighting, navigational aids (NAVAIDs), construction, wildlife hazards, and public protection. The inspections should be standard, and more important, performed on a routine basis. Because the Board of Directors is exposed to liability regarding the safety of the operating environment, it is recommended that an airfield inspection (followed by corrective actions for noted deficiencies) be conducted on a daily basis.

Much is written on the subject of airport pavement maintenance. Because runways are the backbones of airports, much time and money are spent nationally to inspect, repair, and replace airfield pavement. Again, routine inspections and preventive maintenance programs cannot be stressed enough because of the expense of pavement repair.

If there is the slightest chance that an airport will experience snow and ice conditions, a snow and ice control plan should be established. At a minimum, a snow and ice control program should identify equipment, personnel, airfield inspection procedures, snow removal priorities, and a list of key contact personnel involved in coordinating airfield operations. It is recommended that a snow removal committee be established and the snow and ice control plan updated and discussed on an annual basis prior to the snow season. An effective method to disseminate current airfield conditions to the pilots and local tenants should be established as well.

FAA AC 150/5200-30, *Airport Winter Safety and Operations,* is an excellent source when establishing or revising the airport's snow removal plan. This source provides information on runway friction reporting equipment utilized to measure the runway's breaking conditions for aircraft. In addition, it discusses treatment of pavements with chemical and nonchemical techniques to improve conditions.

Properly maintained airfield lighting is an essential component of successful airfield operations. Lighting should be inspected on a daily basis during a period of low daylight to ensure all units are working properly. Lighting is required to be replaced as soon as a deficiency is noted. NAVAIDs may be maintained by the FAA or state or local agencies but should be monitored by the Board or operator to provide timely maintenance reporting. Lighting and NAVAID maintenance logs will assist with preventive programs and replacement determinations.

As part of the daily airfield inspection, special attention should be given to airfield signage and markings. Markings may fade over time because of weather, frequent aircraft landings, and snowplow operations. This fading or erosion may not be noticeable to the daily inspector. A periodic inspection specifically noting airfield markings with a fresh set of eyes will help with this issue.

Outlining the critical markings with black paint and glass beads for lighting reflection are also recommended to improve safety. Signage is critical for airfield safety, especially for transient pilots unfamiliar with the airport. Ensuring that airfield signs have reflective panels and working lights and remain clear of obstructions will also improve safety.

Vegetation obstruction and erosion control is also part of the daily inspection. Because these issues change slowly and may not be noticeable to the daily inspector, they should be included in a specific periodic inspection. The airfield should be inspected on an annual basis for trees and other objects that may violate the airport's approach airspace. Once identified, the objects should be removed and a management plan established for future growth. A plan should be

established to control erosion that may affect the aircraft movement areas and security fencing. Vegetation growth may also contribute to wildlife hazards. The survey conducted during the preparation of this guidebook indicated that a large percentage of airports use herbicide to help manage vegetation as a maintenance practice and a wildlife mitigation technique. Most airport managers cite frequent grass mowing as the preferred practice. In addition, airports will allow local individuals to cut the grass as hay, which saves the airport time and money. Contact the local wildlife representative for help in developing an effective plan to manage vegetation and control certain wildlife.

The attacks of September 11, 2001 resulted in more financial aid for airport security. However, the motivation at most small airports for installing fencing is not the threat of terrorist attacks as much as pedestrian and wildlife incursions. Financial assistance for most small airports recognizes the combined value of safety and security. Prior to installing an airport fence, the airport manager should consider local conditions and the object to be deterred. Ground frost may push fence bases upward in northern climates; special bases may be required in sandy or wet locations; and heights exceeding 10 feet may be recommended for keeping out deer.

Landside Maintenance

Airport maintenance includes the landside, or pedestrian side, of the airfield as well. Routine inspections should cover public areas such as buildings, sidewalks, roadways, and parking lots. Special attention should be given to safety-related items, especially during construction and adverse weather conditions. Routine inspections help the general upkeep and save dollars under an efficient preventive maintenance program. Remember, the airport is the "front door" to a community and a good (or bad) first impression is the responsibility of the Board and operator.

C.   Security

Development of an Airport Security Program

When initially developing an airport security program, establishment of a committee representing airport management, airport tenants, and local law enforcement is recommended. Individuals with knowledge of the airport's operations, tenant operations, and local law enforcement procedures contribute to the success of such a program. These individuals serve a key role when completing the vulnerability assessment to identify which security enhancements will be required. In addition, their participation may contribute to the acceptance and implementation of the program in a timely manner.

The TSA's *Security Guidelines for General Aviation Airports* lists the essential components for developing a security program. These components include personnel, airport facilities, surveillance, security procedures, communications, and specialty operations. The circumstances of each airport will determine which security enhancements will be included in the program and how they will be implemented and enforced.

Once developed, the written airport security program should be shared with others on a need-to- know basis only. The TSA considers the plan to be sensitive security information, and the Board aids security by safeguarding such site-specific information.

Local Training and Airport Familiarization

An airport security plan is only as effective as it is current and rehearsed. Airports regulated under TSR Part 1542 are required to provide a review of the plan every 12 months,

including every agency with a responsibility in the airport security program. Today, most response agencies have annual training requirements, and it makes good sense to include the airport in those, thereby combining efforts to save time and costs. This also provides a great opportunity for multiple agencies to practice coordination and learn of each other's resources and capabilities. The ability to disseminate information about illegal and suspicious activities is imperative. Exercising contingency plans and maintaining current contact information and procedures ensures efficient response in times of need.

Local law enforcement agencies should understand their responsibilities in the airport security program. They need to be as familiar with the airport's operating procedures and the airport property as they are with local procedures for their city streets and facilities. Commonly, local agencies do not spend the time to familiarize themselves with the airport's surroundings and airfield access procedures. Fences, locked gates, locked doors, and security regulations may pose obstacles for responding agencies unfamiliar with the airport. Airport operators must also consider informing agencies of airport issues such as construction, procedural changes, and seasonal operations that could affect their response.

In addition, security training should be provided to tenants, contractors, and anyone else who has authorized access. This should include airport familiarization, security procedures, and reporting procedures. Special consideration should be given to responsibility for individual awareness. A comment provided during the security portion of the survey raises an excellent issue—complacency. The comment stated, "Another problem that people like me who manage a small county airport face is the fact that we have always lived in a safe and secure environment and this causes us to doubt what we may actually be seeing and just write it off when the situation requires urgent action." The survey also indicated a strong need to include provisions in the security program to deter theft and vandalism.

Security Technology

Security technology utilized to enhance airport security comprises various components. Items such as access control and closed-circuit television (CCTV) systems are becoming more popular and financially reasonable compared to past years.

Access systems for doors and gates leading to secured areas range from the simple—lock and keys, remote-controlled gates, and proximity cards—to the complex—computer-based access control systems and biometric systems. Obviously, the more complex the systems, the higher the cost will be for installation and operation. To determine which system is appropriate for a particular facility, such factors as physical requirements, costs, reliability, and data recording will need to be considered. An important factor to remember when choosing an access system is its ability to remain uncompromised. The Board should keep an inventory of access media and can negate access if required.

Surveillance methods such as CCTV systems are becoming more and more popular due to their lower costs, provision of security coverage with fewer personnel, and the ability to record events to document activities. Certain systems also can monitor and record off-site via the Internet. Various systems are available at local electronic retail outlets or national vendors. Intrusion detection systems are another method for monitoring individual facilities or the property's perimeter. The systems are typically monitored by an off-site contracting company. If an intrusion or other event such as a power outage or fire is detected, the company will contact the

airport manager or local police or fire department. Again, the costs will be directly proportional to the complexity of the systems installed.

Airport security requires a team concept. Awareness, education, surveillance, and vigilance must be shared by all airport users.

D.   Emergency Preparedness

Airport Emergency Plan

Small airports not certified under FAR Part 139 are not required to develop and maintain an airport emergency plan (AEP). The majority of airport operators, however, have undertaken this task because of its importance and the airport operator's recognition of responsibility to public safety. Airport operators face challenges in emergency events due to the airport's distance from the responding agencies, few resources, and inadequate funding. These challenges emphasize the Board' need to establish a basic AEP to minimize the possibility and extent of personal injury and property damage in the event of an emergency. The primary purpose of an AEP is to establish delegation of duties, assign agency responsibilities, provide coordination of response efforts, and provide an orderly transition between normal and emergency operations. The development of an AEP will also provide an inventory of available resources and those that will be needed in an emergency event. A good starting point in the AEP development process should be a review of FAA AC 150/5200-31B, *Airport Emergency Plan* (2008).

Operational Planning Procedures

Each airport operator should establish operational planning procedures for the airport. The first hour of response is critical for life-saving efforts, considering an airport's lack of resources and a possible lengthy response time from other professional emergency responders. During this period, on-duty staff should be given an organized checklist that provides guidance and coordination.

Such a checklist should include a prioritized list of names and phone numbers of the agencies to contact. It should also provide procedures to follow as the emergency response progresses. Finally, it should cover procedures to ensure airport operations are restored properly and safely before returning the facilities to public use. Checklists are best kept concise and in easy reach of potential users.

Emergency Training and Airport Familiarization

An AEP is only as effective as it is current and rehearsed. FAR Part 139.325 requires a review of the plan every 12 months and a live exercise every 36 months that includes every agency with a responsibility in the AEP. Today, most response agencies have annual requirements to perform training, and it makes good sense to include the airport and combine efforts to save time and costs.

Combining training also provides a great opportunity for multiple agencies to practice coordination and learn of each other's resources and capabilities. Communication is the most significant problem encountered during emergency events. Providing a practice drill provides an excellent opportunity to research this challenge and improve shortfalls.

Responding agencies should be as familiar with the plan and the airport as they are with local procedures for their city streets and facilities. Commonly, local agencies do not spend the

necessary time to familiarize themselves with the airport's surroundings and airfield access procedures. Fences, locked gates, locked doors, and security regulations may pose obstacles for responding agencies unfamiliar with the airport. Airport operators must also consider informing agencies of airport facility changes that could affect their response such as construction, procedural changes, and seasonal operations.

Aircraft Accidents and Incidents

Statistics show the greatest potential for aircraft accidents occurs during the landing or departure operation of the flight. A high percentage of all aircraft accidents occur on or near the airport property, but accidents may occur at any time or any place. Such unpredictable occurrences are another reason to closely coordinate efforts with agencies that have jurisdictional responsibilities for the surrounding community.

The response to each aircraft accident or incident will be different because of variables such as location, aircraft type, number of people involved, type and amount of fuel or cargo on board, and weather. However, the basic response should include the same considerations. Safety for the lives of the victims and the responders is paramount throughout the response and recovery efforts.

Professional responders are equipped with the resources and training to provide an efficient and safe response. The airport operator and first responders should keep the area clear of all people until it is safe to enter. Once a safe perimeter is established and rescue efforts have been completed, the aircraft and perimeter need to be protected from disturbance until necessary investigations are completed. (Investigations may be performed by the NTSB, FAA, FBI, TSA, and other state and local agencies.) It is the responsibility of the aircraft owner or operator to remove the aircraft when released by the investigating agencies. The Board, however, will need to oversee the coordination of such events and be prepared to possibly help with local resources.

Media Relations

Involving the media in the AEP and training events provides a great public relations opportunity to demonstrate the hard work and preparedness the airport and responding agencies develop during the AEP process. More important, involving the media in the AEP informs them how, when, and where to respond during an emergency. The airport operator should establish an area for media briefings and be prepared to provide timely and informative briefings during an event. This step makes for good public relations and demonstrates professionalism by the airport and responders. Inviting the media to the AEP reviews and live exercises also educates them about the dangers of emergency response and stresses safety procedures. Once the scene is secured, the airport operator can coordinate times and methods to film and cover events in a safe manner.

Prior to interacting with the media during an emergency, the airport manager should spend a few moments preparing a brief and factual statement, select an appropriate site without a view of death or destruction, and arrange to have the media members' identification verified to prevent unauthorized entry to press briefings. During interaction with the media, the airport manager should project a positive image for the airport and responding agencies by remaining calm and serious and avoiding emotional statements, control the briefing by providing brief facts only, and refrain from accepting responsibility for the accident. Chapter 5, Public Relations, contains additional information about media relations.

Preferred Practices and Recommendations

The following preferred practices and recommendations were provided by the Board and operators during the development of this guidebook:

- Host a base of the local ambulance authority to provide a quicker response time to the airport and throughout the city.

- Get involved with the local emergency management association.

- Ensure mutual aid agreements are in place and the airport is included in the local emergency agency's response plans, too.

- Maintain a certain amount of control during the emergency to include limiting unnecessary radio chatter.

- Include provisions in the airport emergency plan for fuel spills and natural disasters.

- Ensure responding agencies are familiar with utility shut-off sources.

- Conduct annual fire inspections of airport facilities to include aircraft hangars.

- When calling 9-1-1 with a cell phone, always tell the dispatcher specifically where the emergency is located. (In one instance, the dispatcher sent the agencies to the neighboring airport by mistake!)

- Establish a chain of command prior to an event, improve communication procedures, and train, train, train!

V.   AIRPORT PLANNING AND DEVELOPMENT

Airport planning and development is essential for the success of an airport. It provides the foundation for growth of an airport by creating a plan not only for the development but also for the process used to implement the planned projects. A number of federal requirements govern various development projects, as well as the planning and development process. This chapter will address the planning and development process and the various tools, techniques, and requirements associated with implementing this essential part of the airport management process.

A.   Planning

Planning provides a framework to establish a baseline of existing land uses and to forecast future growth. A number of planning processes, at various levels, can assist with the development of an effective and efficient aviation system:

- National Plan of Integrated Airport Systems;

- State aviation system plans

- Regional aviation system plans;

- Airport master plans and airport layout plans;

- Design standards;

- Project justifications;

- Compatible land use plans; and

- Airport zoning ordinances, including land use and height limitations.

National Plan of Integrated Airport Systems

In the mid-1940s, when the aviation industry was in its infancy, the federal government and aviation industry recognized that a national approach to managing the emerging aviation system was necessary. More than 60 years later, this need to plan for the aviation system from a national perspective is still taking place through the NPIAS. The most recent version of the NPIAS addresses the future of the system, from 2007 to 2011. This plan was developed in accordance with 49 USC 47103.

Primary Principles of the NPIAS

First issued in 1946, the NPIAS provides guidance to the national aviation system, which has evolved to be guided today by the following nine primary principles:

- Airports should be safe and efficient, located at optimum sites, and developed and maintained to appropriate standards.

- Airports should be affordable to both users and government, relying primarily on user fees and placing minimal burden on the general revenues of the local, state, and federal governments.

- Airports should be flexible and expandable, able to meet increased demand and to accommodate new aircraft types.

- Airports should be permanent, with assurances 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 and the requirements of residents in neighboring areas.

- Airports should be developed in concert with improvements to the air traffic control system. • The airport system should support national objectives for defense, emergency readiness, and postal delivery.

- The airport system should be extensive, providing as many people as possible with convenient access to air transportation, typically by ensuring that most travelers will have no more than 20 miles to travel to the nearest NPIAS airport.

- The airport system should help air transportation contribute to a productive national economy and international competitiveness.

In addition to these guiding principles, the national aviation system is also under the requirement associated with Executive Order 12893, which states that investment in federal infrastructure systems must be cost beneficial. The national priority system, as outlined by the NPIAS through the aforementioned principles, guides the general distribution of funds, with flexibility provided if there is additional analysis and justification.

Airports within the NPIAS

The plan identifies 3,431 airports that are of significance to the national air transportation system.

As of July 2006, the FAA reported that there were 5,261 airports open for public use within the United States. Of these 5,261 airports, 3,431 (65%) are identified as part of the

NPIAS. These NPIAS airports comprise 3,364 existing airports and 67 proposed airports. Of the existing airports, 3,251 are publicly owned while 113 are privately owned. A brief summary of existing NPIAS airports by FAA classification is as follows:

- 382 primary airports,

- 135 commercial service airports,

- 274 reliever airports, and

- 2,573 general aviation airports.

Non–NPIAS Airports

There are 918 airports open for public use but not included within the NPIAS. These airfields are not included because they do not meet the minimum criteria:

- At least 10 based aircraft,

- At least 20 miles from another NPIAS airport, and

- Adequate opportunities for expansion or improvements at the site.

According to the 2007–2011 NPIAS, public-use airports not included in the NPIAS have an average of one based aircraft, compared to an average of 33 based aircraft at general aviation airports included in the NPIAS.

NPIAS Funding

Inclusion in the NPIAS establishes an airport's eligibility to receive grants under the FAA AIP, as well as identifies its role in the national system. According to the 2007–2011 NPIAS, over the next five years there will be an estimated $41.2 billion in AIP-eligible infrastructure development spread over the various segments of the national aviation system.

Airport Master Plans and Airport Layout Plans

Airport master plans and airport layout plans (ALPs) are a companion set of documents essential to the development of an airport. These two documents combine to provide the foundation from which an airport sponsor can make decisions about the future growth and development of an airport. The master plan document is the narrative piece of the planning process that documents the process, alternatives, and recommendations. The ALP is the drawing set that graphically depicts the recommendations of the planning process.

Purpose of an Airport Master Plan and ALP

Airport master plans and ALPs are long-range plans that detail the growth and development of the airport. These plans are typically based on a 20-year planning time frame and should be reviewed and updated every five to 10 years. The contents of an airport master plan are governed by FAA AC 150/5070-6B, *Airport Master Plans,* which can be found on the FAA website (www.faa.gov/airports_airtraffic/airports/resources/advisory_circulars).

The contents of individual airport master plans are often used as the basis for the development of state aviation system plans, discussed in the previous subsection. The process of developing an airport master plan and the resulting ALP provides airports with the opportunity to assess existing facilities and evaluate future development options. Essentially, the master plan is the Board's or sponsor's strategy for developing the airport.

While airport master plans and ALPs are developed to address future needs, they should also consider the costs associated with the implementation of the plans. Additionally, consideration must be given to the environmental and socioeconomic impacts that may result from or be caused by the proposed actions. Efforts to avoid, minimize, or mitigate potential impacts to sensitive resources should be considered as part of the planning process.

As outlined in the FAA AC 150/5070-6B, *Airport Master Plans* (*9*), a master plan and the planning process should meet nine objectives:

- Document the issues that the proposed development will address;

- Justify the proposed development through the technical, economic, and environmental investigation of concepts and alternatives;

- Provide an effective graphic presentation of the development of the airport and anticipated land uses in the vicinity of the airport;

- Establish a realistic schedule for the implementation of the development proposed in the plan, particularly the short-term capital improvement program;

- Propose an achievable financial plan to support the implementation schedule;

- Provide sufficient project definition and detail for subsequent environmental evaluations that may be required before the project is approved;

- Present a plan that adequately addresses the issues and satisfies local, state, and federal regulations;

- Document policies and future aeronautical demand to support municipal or local deliberation on spending, debt, land use controls, and other policies necessary to preserve the integrity of the airport and its surroundings; and

- Set the stage and establish the framework for a continuing planning process. Such a process should monitor key conditions and permit changes in plan recommendations as required.

Importance of Airport Master Plans and ALPs

Master plans and ALPs provide local decision makers with information to guide growth and development of an airport and should be used as a resource for the development of other community planning documents, such as local comprehensive plans. An airport master plan and the associated ALP should be provided to the local land use decision makers when they are evaluating projects in proximity to an airport in order to maintain compatible land uses for ultimate airport development. These plans are a guide in the continued development of an airport. While predominantly used by those with an interest in aviation, such as airport owners, state aviation agencies, and the FAA, an airport master plan and the associated ALP drawing set can be a useful document for municipal officials, planners, and the general public.

The planning process can afford not only the airport and those interested in aviation issues, but also those within the local community, an opportunity to work together to assess the future needs of the airport and the local community. Airports included in the NPIAS are required to have an ALP on file with the FAA. This file allows the FAA to evaluate airspace concerns within the vicinity of the airport, utilizing the FAR Part 77 surface criteria and the Terminal Instrument Procedures (TERPS) criteria. While an airport's master plan and ALP are reviewed by the FAA,

only the forecast of demand and the ALP are actually approved by the FAA. Some states require airports to meet very specific requirements in order to receive state funding of their planned projects.

Additionally, at the local level, it is essential that the local community's comprehensive planning process consider its local or neighboring airport(s). If a local planning document does not provide a foundation to support decision making regarding the development of compatible land use in the vicinity of a local airport, it is unlikely that an effective planning process can be accomplished.

Airport sponsors should become involved early in the planning process to share the airport needs and future development plans with the local municipality. This involvement should focus on educating the local municipality regarding the value the airport brings to the community as well as the need to preserve its operational areas. Airport sponsors or directors can become involved in the planning process in several ways:

- Have representation on the planning advisory or steering committee;

- Provide comments during the public comment portion of the process;

- Provide comments to other representatives of the advisory/steering committee to present airport-related concerns and issues; and

- Share airport master plans/airport layout plans with the local municipality to inform it of airport development.

Airport-related representatives should become engaged in the general planning process on a regular basis, not just during comprehensive planning exercises, to ensure adequate representation of airport interests.

Development of an Airport Master Plan and ALP

Both an airport master plan and an ALP contain a specific set of information that guides the growth and development on an airport. Each of the documents and its associated components are described below in a general manner to outline the basic elements of each. It is recommended that prior to beginning a planning project, a considerable amount of time and effort be spent on developing a project scope of work that will clearly define the goals, objectives, and specific work elements of each of the documents.

An airport master plan is a comprehensive study of an airport or system of airports with short-, medium-, and long-term development plans to meet future airport demand. It is designed to put forward recommendations for the safe, efficient, and economic development of an airport to meet the demands of the community it serves. The process should focus on preparing a thoughtful, well-coordinated, and practical plan that includes a realistic assessment of needs and resources. The end product should be a cost-effective plan of action for an airport or system of airports consistent with established goals and objectives.

The importance of the planning process can be summarized by "plan first, program second." That is, allow the results of the planning analysis to determine the facility requirements and needs based on FAA-approved forecasts, then develop appropriate alternatives for airport development prior to selecting a preferred alternative to present in the ALP drawings. A phased planning approach to project development should be utilized for complex programs. In most instances, it is suggested that a more "outside of the box" thinking process be used to create a work

program specific to the project, supporting a justified need and cost-effective alternatives to meet those needs.

To begin the process, it is recommended that a complete understanding of available information and the issues to be addressed be compiled before a scoping meeting is held. Once these initial data are available, a planning meeting can be conducted to discuss realistic expectations with all the involved parties and determine which tasks should be included in the statement of work, based on the issues and needs at a specific airport.

An important part of the planning process is community involvement, which should be planned for and accommodated throughout the entire planning effort. Community involvement from the initiation of a planning study is critical for its successful completion. A technical advisory committee should be established that is composed of representatives from airport users as well as the local community. Metropolitan planning organization (MPO) and state aviation agency inclusion is crucial on these committees. Committee meetings should be held regularly during the study, during which updates on planning tasks can be provided and input from the members can be sought.

Bringing potential adversaries in early during the planning process to educate them on airport basics can be an effective technique for addressing potential opposition and may help with buy-in later. Using the Internet and developing a project web page to disseminate information about the planning process is recommended.

A typical planning process includes individual elements that provide a fairly linear method of assessing the facility and its needs to meet the goals for development. For example, the following elements provide the basic guide for building an airport master plan, and these elements are modified for each study depending on what the primary emphasis may be for a specific airport:

- Inventory of existing conditions and facilities,
- Forecasts of aviation demand,
- Operations,
- Number and/or type of based aircraft,
- Number of enplanements, where appropriate,
- Facility requirements,
- Alternatives for development,
- Recommended development,
- Environmental overview,
- 21 categories as outlined by the National Environmental Policy Act (NEPA),
- Financial feasibility,
- Cost estimates for development,
- Rates and fees for airport services,
- Airport layout plan,

- Cover page,
- Airport data sheet,
- Airport layout sheets,
- Aerial and topographic features sheet,
- Approach sheets,
- FAR Part 77 surfaces sheet,
- Airport property plan, and
- Air Traffic Control Tower (ATCT) line-of-site plan.

A sponsor should address the needs and goals for development of each element based on the airside (i.e., runways, taxiways, aprons, etc.), landside (i.e., terminals, parking areas, hangars, etc.), and facilities and services (i.e., FBO, fuel, rental cars, maintenance, etc.) for its specific airport needs.

As previously noted, a comprehensive public involvement process should be used to help develop individual goals for an airport as the goals relate to the aforementioned elements. Looking at the long-term growth of the airport facility is necessary to create an effective master plan document.

B.   Development and Construction Standards

Design Standards

The primary federal requirements for airport development, particularly design standards, are included in the Federal Aviation Regulations. The FAA publishes advisory circulars to assist airport sponsors in complying with the requirements. The majority of this information is available to airport sponsors and the public through the FAA's website.

A variety of federal and state agencies have regulatory authority over the multitude of issues that may affect airport design decisions, as well as land use and development near airports. In general, the FAA and the state aeronautics agency should be contacted when questions about airport design or development near an airport arise. In addition to contacting the FAA and the state, each airport and its host community should evaluate specific airport needs to identify other federal, state, or local agencies that may need to be consulted prior to the development of an airport master plan, ALP, land use plan, or construction project. The FAA design standards, which pertain to the physical layout of an airport, are the primary source of design criteria and lay the foundation for airport development using federal funds.

AC 150/5300-13, Airport Design

Airport design standards, as defined by FAA AC 150/5300-13, *Airport Design,* are implemented for the safe and efficient operation of an airport (*10*). Many design requirements are contained in this advisory circular and its appendices, which cover a wide range of airport design issues, including:

- Airport geometry;
- Runway and taxiway design, including safety areas;

- Surface gradients and line-of-sight standards;

- Site requirements for navigational aids and air traffic control facilities;

- Runway and taxiway bridge criteria;

- The effects and treatments for jet blasts;

- Wind analysis;

- Runway end siting requirements;

- Airport reference code calculations;

- Compass calibration pad specifications;

- Small airport buildings, airplane parking, and tie-down layouts;

- Metric conversions;

- ALP components and preparation recommendations;

- Runway and taxiway design rationale;

- Computer programs available for use;

- Airplane data for a sample of aircraft within the national fleet;

- Declared distance concepts;

- Methods for the transfer of electronic data;

- New instrument approach procedures; and

- Recommendations for minimum distances between airports and on-airport agricultural uses.

Safety areas—clear areas near the runway and the approach environs—should be evaluated as part of the master planning process, along with the other design standards, to provide adequate design measures to facilitate safe and efficient development of airport facilities. Several of the most critical of the airport design standards illustrate the importance of having these safety areas:

Runway protection zones (**RPZs**), formerly known as clear zones, were originally established to define land areas below aircraft approach paths in order to prevent the creation of airport hazards or development of incompatible land use. First recommended in a 1952 report, *The Airport and Its Neighbors,* by the President's Airport Commission, the establishment of clear areas beyond runway ends was deemed worthy of federal management. These clear areas were intended to preclude the construction of obstructions potentially hazardous to aircraft and to control building construction for the protection of people on the ground. The U.S. Department of Commerce concurred with the recommendation on the basis that this area was "primarily for the purpose of safety for people on the ground." The FAA adopted clear zones with dimensional standards to implement the Commission's recommendation.

RPZs are designed to protect people and property on the ground. They are located at the end of each runway and should ideally be controlled by the airport. Control is preferably exercised by acquisition of sufficient property interest to achieve and maintain an area that is clear of all incompatible land uses, objects, and activities.

The RPZ is trapezoidal in shape and centered on the extended runway centerline. Dimensions for a particular RPZ are based on the type of aircraft and approach visibility minimums associated with the runway end. Unless noted by a special circumstance, the RPZ begins 200 feet beyond the end of the runway and has specific land use restrictions in order to keep the approach and departure areas clear of obstructions. Table 3 provides dimensional information for the various RPZ sizes. Figure 4 provides a graphic representation of the RPZ dimensions. The RPZ has two specific areas: the central portion of the RPZ, which is equal in width to the runway object-free area, and the controlled activity area, which is adjacent to the central portion of the RPZ.

The RPZ dimensional standards are for the runway end with the specified approach visibility minimums. The departure RPZ dimensional standards are equal to or less than the approach RPZ dimensional standards. When an RPZ begins other than 200 feet (60 meters) beyond the runway end, separate approach and departure RPZs should be provided. Refer to FAA AC 150/5300-13 Change 11, Appendix 14, for approach and departure RPZs (*10*).

Runway safety areas (**RSAs**) are rectangular, two-dimensional areas surrounding a runway. The FAA notes that RSAs should be cleared, graded, properly drained, and free of potentially hazardous surface variations. RSAs should also be capable of supporting snow removal, aircraft rescue and firefighting (ARFF) equipment, or an aircraft that overshoots the runway without causing damage to that aircraft. Taxiways also have similar safety area requirements. The actual size of an RSA is dependent upon the FAA classification of the runway (e.g., A-I, B-II, C-III).

Runway object-free areas (**OFAs**) are two-dimensional ground areas surrounding runways where all above-ground objects must be removed unless fixed by their function, such as runway lights. FAA standards prohibit objects and parked aircraft from being located within the runway OFA. Taxiways also have OFAs.

RSAs and OFAs are almost always contained within airport property. However, RPZs can often extend beyond airport property. Therefore, from an off-airport land use compatibility perspective, the critical safety zone identified by FAA design standards is the RPZ. The FAA recommends that, whenever possible, the entire RPZ be owned by the airport and clear of all obstructions if practicable.

Where ownership is impracticable, aviation easements are recommended to obtain the right to maintain the height of structures and vegetation within the RPZ footprint. Obtaining easements that are restrictive enough to limit building opportunities as well as height are often just as costly to procure as purchasing the property outright.

Other Supporting Documents

Other supporting documents that offer information related to various design standards or FAA criteria useful for airport managers include the following:

- **AC 70/7460-1,** *Obstruction Marking and Lighting.* This advisory circular identifies obstruction marking and lighting requirements for any proposed construction or alteration that may affect the NAS.

- **AC 70/7460-2,** *Proposed Construction or Alteration of Objects that May Affect the Navigable Airspace.* This advisory circular provides information regarding the erection or alteration of an object on or near an airport that may affect the navigable airspace as required in FAR Part 77. In addition, this advisory circular explains the

process by which to petition for discretionary review, thereby providing the FAA the opportunity to

–   Recognize potential hazards and minimize the effects to aviation,

–   Revise published data and/or issue a NOTAM,

–   Recommend appropriate marking and lighting to make objects visible, and

–   Depict obstacles on aeronautical charts.

The complete advisory circular is available online from the FAA Regulatory and Compliance Library (www.airweb.faa.gov/).

*   **Form 7460-1, Proposed Construction or Alteration of Objects that May Affect the Navigable Airspace, and Form 7460-2, Supplemental Notice of Actual Construction or Alteration**. These forms are required at all federally obligated airports to assess each proposed or temporary construction in the vicinity of the airport. The FAA conducts an aeronautical study and issues a determination to the proponent. The determination identifies whether the proposed development is a hazard to airspace. It is imperative that local planners be aware of the various critical safety considerations when developing around airports. The following requirements apply:

    –   Form must be submitted at least 30 days prior to the date the construction or alteration is to begin.

    –   Notice is required on or before the date an application for a construction permit is filed with the Federal Communication Commission (FCC), well in advance of the 30-day period.

The complete documents can be found online at http://forms.faa.gov/forms.

*   **FAR Part 157,** *Notice of Construction, Alteration, Activation, and Deactivation of Airports.* This part of the FAR provides guidelines, procedures, and standards that should be used in determining what effect construction, alteration, activation, or deactivation of an airport will have on the safe and efficient use of the navigable airspace by aircraft. A notice does not need to be filed if the work is done under a federal-aid project. The complete document can be found on the FAA's Central Region website (www.faa.gov/airports_ airtraffic/airports/regional_guidance/central/construction/part157/). (This guidance was developed by the FAA's Central Region ADO. Airport managers should verify the applicability of the information with their local FAA ADO.)

*   **Form 7480-1, Notice of Landing Area Proposal.** This form works in conjunction with FAR Part 157, which requires a 90-day notification prior to any construction, alteration, deactivation, or change to the use of an airport. Notice is required for plans to:

    –   Construct or otherwise establish a new airport or activate an airport;

    –   Construct, realign, alter, or activate any runway or other aircraft landing or take-off area of an airport;

- Construct, realign, alter, or activate a taxiway associated with a landing or takeoff area on a public-use airport;

- Deactivate, discontinue using, or abandon an airport or any landing or takeoff area for a period of one year or more;

- Deactivate, abandon, or discontinue using a taxiway associated with a landing or takeoff area on a public-use airport;

- Change the status of an airport from private use to public use or from public use to another status;

- Change the status from instrument flight rules (IFR) to visual flight rules (VFR) or VFR to IFR; or

- Establish or change any traffic patterns or traffic pattern altitude or direction.

The complete document can be found on the FAA website (http://forms.faa.gov).

Compatible Land Use Plans

Incompatible land uses and their impact on airport operations and development have escalated over the past 50 years. As decisions to allow incompatible land uses near airports threaten the nation's aviation system, implementation of compatible land use controls has become an industry priority. The primary tools available to local governments to prevent incompatible development include zoning and land use controls such as comprehensive plans, airport land use plans, and airport overlay zoning ordinances.

Definition of Compatible Land Uses

One of the primary challenges with compatible land use is establishing a specific definition of what is considered either compatible or incompatible to an airport and aircraft operations. Airport-compatible land uses are defined as those developments that comply with generally accepted restrictions on location, height, and activity that provide for safe aircraft movement and airport operations. Additionally, this definition includes the preservation of public health, safety, and welfare for those persons located in the surrounding airport environs.

This definition can appear vague because no specific land use types are specified. The vagueness is intentional because nearly every type of land use can be both compatible and incompatible depending on the particular aspects of the land use, including the management of the land use, location of the land use relative to the airport, and ancillary types of impacts associated with the land use. For example, land uses typically considered to be compatible with airport operations include commercial, industrial, and agricultural activities. However, each of these may also contain aspects considered incompatible, because:

- Commercial uses may have dense concentrations of people;

- Industrial operations often use tall smoke or ventilation stacks that generate smoke or steam, creating visual obstructions; and

- Agricultural operations can act as wildlife attractants.

Planners within the local municipality must assess the compatibility of the land use in greater detail as it relates to individual communities and airport operations. Land uses of concern

to airports include those that attract high concentrations of people, those that use tall structures, those that create visual obstructions, and those that attract wildlife and birds.

Compatibility Plan

A compatibility plan can be developed to guide land use decisions in the vicinity of an airport. A plan should include several elements to provide a comprehensive document, such as

- A land use manual, used as a resource document for land use compatibility concerns;

- A land use map; and

- A land use ordinance.

A compatibility plan is generally prepared to:

- Assist in the preservation, continued development, and expansion of an airport;

- Protect the public health, safety, and welfare by identifying land use measures to be implemented in order to minimize the public's exposure to excessive noise and safety hazards within a specific area surrounding an airport;

- Protect the long-term economic viability of an airport by establishing compatible land uses within the airport's environs;

- Promote the safety and well-being of the public through the adoption of land use regulations, which minimize exposure of persons to hazards associated with the operation of an airport;

- Provide an ordinance and criteria to help local municipalities (i.e., county, city, etc.) evaluate the compatibility of proposed local actions and determine the consistency of those proposed local actions to maintain compatible land uses in proximity to the airport; and

- Provide guidance to those persons presenting proposed local actions or developments.

Using a blend of the FAA criteria, airport-compatible land uses are defined as those developments that comply with generally accepted restrictions on location, height, and activity to provide for safe aircraft movement and airport operations as well as the preservation of public health, safety, and welfare for those persons located in the surrounding airport environs.

Examples of land uses typically considered compatible with airport operations include commercial, industrial, and agricultural activities. Land uses such as residential developments, schools, and hospitals are considered incompatible with airport operations. Each of these examples must be evaluated in detail as it relates to individual communities, because even those uses considered compatible can have instances where incompatibility can arise. Conversely, some incompatible uses can be considered compatible if managed properly.

Zoning

Zoning that facilitates the preservation of an airport through compatible land use can take on many forms, from incorporation into a local municipal zoning ordinance to acting as a standalone ordinance that allows for the control of land use decisions near an airport. Planning documents (plans) provide the basis for the development of ordinances and regulations, which in turn provide structure for implementing land use controls. Ordinances are legal documents developed by municipalities to regulate land uses and associated activities with designated locations to

protect, preserve, and enhance the quality of life for residents. Regulations are the tools that provide authority for the day-to-day implementation of an ordinance. The combination of all three of these techniques (i.e., plans, ordinances, and regulations) is necessary for effective land use planning.

Ordinances reflect what is written in a community's comprehensive plan and are effective tools to reduce incompatible land uses surrounding airports. When a local municipality undertakes the development of a zoning ordinance for land use compatibility, consideration should be given to current zoning and approval actions required by state agencies. A legal review of the proposed airport land use and height overlay zoning ordinance is suggested to determine if the ordinance is consistent with local and state regulations.

Zoning ordinances are used to specify any or all permitted, regulated, or restricted land uses that may endanger the health, safety, and welfare of citizens. Ordinances that regulate airport land use and height should be incorporated into a city's or county's comprehensive zoning ordinance, or both, to protect the safe operation of airports and movement of aircraft as well as the safety of people on the ground in proximity to airports.

One of the most common forms of zoning associated with airports is the development of an airport overlay-zoning ordinance (AOZO). An AOZO is an extraterritorial tool that promotes compatible land use and height limitations within the vicinity of an airport. The sponsoring party, typically the local municipality, or a state statute determines the specific distance governed by the AOZO. The AOZO is most often adopted according to

- Land use–related restrictions,
- Height-related restrictions, or
- Combination of height- and land use–related restrictions.

When feasible, it is recommended that the combination of height and land use restrictions be used when developing the AOZO in order to adequately protect the airport, safe movement of aircraft, and the persons on the ground within the vicinity of the airport. Overlay zoning applies additional conditions or restrictions to a specified area while retaining the existing base zoning classification underneath the overlay zoning districts.

The AOZO can be highly effective in addressing a number of potential incompatibilities related to airport operational areas. An AOZO may limit the height of objects surrounding an airport as well as restrict specific land uses that create conditions potentially hazardous to air navigation. Such limits may be essential for protecting the health, safety, and welfare of residents as well as maintaining safe aircraft movement and airport operational areas.

Land Use-Related Restrictions

An AOZO that addresses land use issues supersedes the existing underlying zoning within specified zoning districts. It is adopted by city or county governments, or both, to prevent or mitigate potentially incompatible land uses such as noise sensitivity–related issues and safety-related issues (e.g., concentrations of people, tall structures, visual obstructions, and wildlife and bird attractants).

Height-Related Restrictions

An AOZO that focuses on the safety of the airport and the public must include height restrictions for development beyond airport property lines. Multiple jurisdictions can fall within an airport's area of influence. Height limits should be placed on objects, structures, and natural vegetation within this area. This concept, known as "extraterritorial zoning," plays an important role in land use development in regions that have an airport or multiple airports. Used as part of an AOZO, height restrictions preserve navigable airspace. This restriction only applies in states that have legislation that allows these types of restrictions.

Legally mandated by the FAA in FAR Part 77, *Objects Affecting Navigable Airspace,* any object or structure that penetrates any of the "imaginary surfaces" is considered an obstruction to air navigation and forms the basis for height-restriction zoning ordinances. Details regarding specific height restrictions should be included in the AOZO and kept on file with the appropriate governmental agencies (e.g., county, office of aviation, FAA).

FAR Part 77 specifically requires that any person or organization intending to sponsor construction activities or alterations must notify the administrator of the FAA prior to construction for the following conditions:

- Any construction or alteration that exceeds 200 feet above ground level;
- Any construction or alteration:
  - Within 20,000 feet of a public-use or military airport that exceeds a 100:1 surface from any point on the runway of each airport, with at least one runway more than 3,200 feet;
  - Within 10,000 feet of a public-use or military airport that exceeds a 50:1 surface from any point on the runway of each airport, with its longest runway no more than 3,200 feet; or
  - Within 5,000 feet of a public-use heliport that exceeds a 25:1 surface;
- Any highway, railroad, or other traverse way for which the prescribed adjusted height would exceed the above-noted standards;
- When requested by the FAA; or
- Any construction or alteration located on a public-use airport or heliport regardless of height or location.

Notification to the FAA for off-airport development is done through the FAA Obstruction Evaluation/Airport Airspace Analysis (OE/AAA) page (https://oeaaa.faa.gov/oeaaa/external/portal.jsp), which allows for electronic filing of the Notice of Proposed Construction or Alteration (FAA Form 7460-1). For a full discussion of FAA Form 7460-1, refer to the foregoing subsection "Other Supporting Documents" under "Design Standards."

There are a multitude of federal and state agencies with regulatory authority over a wide range of areas that could affect land use decisions near airports. Trying to identify each of these groups and the associated legislation would be a daunting task; consequently, it is suggested that each airport and its host community evaluate the specific needs of the airport and surrounding community to identify other agencies that may need to be consulted prior to development of a land use plan.

Emerging Trends

Several items are expected to have an impact on the aviation industry over the next few years. These items include the introduction of very light jets (VLJs), the introduction of smaller aircraft (often called light sport aircraft), and advances in navigational aids.

Very Light Jets

In 2006 the FAA certified the first VLJs to fly in the NAS. These new vehicles have sparked debate about the future of passenger travel and the aviation industry as a whole. This subsection will

Light Sport Aircraft

A new classification of aircraft called light sport aircraft (LSA) is entering the market. These aircraft give pilots the option of smaller, more economically feasible aircraft to purchase as well as build that do not require the same level of licensure to operate. These aircraft are likely to account for a small portion of the aviation industry; however, until more enter the market and there is more history from which to assess the situation, it is difficult to determine what effect these aircraft may have on the industry as a whole. Many businesses are providing designs for LSAs, which suggests a significant interest, although it is unlikely that all of the companies currently working on LSAs will survive.

The primary concern associated with LSAs is the ability of LSA owners to obtain insurance for the aircraft. In the high-cost market of aviation insurance today, some airports require specific levels of insurance for aircraft based at a particular facility, and this requirement may place limitations on the aircraft and the airports. Additionally, there are questions about the level of demand that will exist for training and sales associated with these aircraft.

Advances in Navigational Aids

Area Navigation (RNAV). RNAV was developed to provide more lateral freedom and thus more complete use of available airspace. This method of navigation does not require a pilot to track directly to or from any specific radio navigation aid. It has three principal applications: • A route structure can be organized between any given departure and arrival point to reduce flight distance and traffic separation;

- Aircraft can be flown into terminal areas on varied preprogrammed arrival and departure paths to expedite traffic flow; and

- Instrument approaches can be developed and certified at certain airports, without local instrument landing aids at that airport.

Automatic Dependent Surveillance–Broadcast (ADS-B). ADS-B is a technology that allows pilots in the cockpit and air traffic controllers on the ground to track aircraft traffic with more accuracy than other systems, specifically radar. ADS-B relies on the Global Navigation Satellite System to determine an aircraft's precise location. The position data are combined with other information such as aircraft type, speed, altitude, and flight number. The information is converted into a digital message and broadcast via a radio transmitter.

There are two components to the system. The first is an onboard transponder that emits a continuous signal. The second component is a ground-based transceiver that gathers location

information and projects it onto a vehicle tracking/surface moving map used by pilots and air traffic controllers.

Proponents of the new technology point to several advantages:

- ADS-B improves safety by giving pilots and controllers reliable, accurate, real-time information about aviation traffic. The system can report aircraft positions to +/− 25 feet, more accurate than a quarter- to a half-mile for radar.

- Because the system has an effective range of 100 to 200 miles, ADS-B provides a greater margin to implement conflict detection and resolution than is currently available.

- ADS-B can signal while an aircraft is grounded. This ability provides safer, more efficient taxi operations and results in greater airport capacity.

- The system has proven to be successful at improving safety. ADS-B was first used in Alaska, where accidents declined by 40% after implementation.

- As part of its Next Generation Air Transportation System, the FAA has requested in its budget $85 million in 2008 and $564 million over the next five years for ADS-B infrastructure development, demonstration, and implementation.

Some key drawbacks have been identified with ADS-B:

- General aviation operations will be linked to the Universal Access Transceiver, while commercial operations will link with the 1090 MHz squitter. These frequencies are incompatible, which means to date the vehicle tracking/surface moving map might not depict both frequencies.

- The targeted implementation date for onboard avionic transponders is 2014 for commercial aircraft and 2020 for all aircraft. Because funding mechanisms for the system are unidentified at this time, it is questionable whether system-wide installation will be achieved by the target dates.

- The 1090 MHz frequency for commercial operations has been used in Europe. Based on experience with the same frequency, some officials there predict system overload in the early 2010s.

Despite greater space across the United States, some remain skeptical.

Consultant Selection

AC 150/5100-14, *Architectural, Engineering and Planning Consultant Services for Airport Grant Projects,* provides important guidance for the selection of a consultant. Use of this document is recommended to ensure appropriate steps are taken to procure the services of a qualified consultant to assist with planning, design, and construction projects. These federal regulations require a quality-based selection process for selecting consultants for projects funded with FAA AIP funds.

This requirement includes consultant selection and procurement by sponsors, states, and the FAA Airports Division. All parties are encouraged to become familiar with the requirements of this AC and use the following guidelines:

- Advertise early enough to give consultants at least three weeks to respond;

- Properly identify the scope of work, required services, project schedule, project details, and selection criteria in all requests for qualifications (RFQs);

- Select a committee to establish a well-defined scoring system and rate the statements of qualifications (SOQs);

- Do not include requests for cost information, including hours or hourly rates, in the RFQ or anywhere in the selection process;

- Use interviews when a clear decision cannot be made on the submitted SOQs;

- Limit the interview short list to no more than three to five firms;

- Notify the consultants at least two weeks in advance of an interview and identify the interview format and expectations;

- Notify all parties of the final selection in a timely fashion;

- Request that the selected consultant develop a detailed work scope and corresponding fee estimate for negotiations;

- Include applicable federal provisions in all consultant contracts;

- Avoid any broad-form indemnity language in contracts; and

- Ensure that key project personnel identified during the consultant selection process are stipulated in the contract.

This process allows for the sponsor to select a qualified consultant and work to negotiate an appropriate fee for the individual needs for each project. Although they may disapprove of the selected consultant, scope of work, cost, or contract, the role of FAA personnel in the sponsor's or state's consultant selection process is advisory only.

C.   Development and Construction Standards

Projects funded under the AIP must be developed in accordance with the policies, standards, and specifications developed by the U.S.DOT. The FAA has the responsibility of determining whether all construction work accomplished under the AIP is in accordance with federal standards.

This section will outline some of the standard procedures for airport facility development and discuss some of the accepted measures for conducting construction operations on an airport. Prior to design, an airfield development project must be shown on an approved airport layout plan. Prior to construction, proper environmental and stormwater clearances must be obtained as discussed in the previous section of this chapter.

Design Development

a)   Predesign Conference

Predesign conferences should be conducted to ensure that the sponsor, the engineer, airport staff, and airport users are aware of the design, safety, and construction requirements and understand their individual responsibilities. The predesign conference, convened and conducted by the sponsor or authorized agent, should be used to discuss various items relating to design parameters, airport safety, routing of aircraft and equipment, sequencing of construction operations, environmental considerations, and civil rights requirements.

The magnitude, type, and location of the project, as well as potential changes in airport use and operations due to the project, will determine the need for a predesign conference. A predesign conference is essential when a project is of sufficient complexity to affect airport operations during construction. Possible conflicts between construction activities and the operation of the airport should be resolved at this meeting.

Attendees of the predesign conference should include the sponsor's engineer, airport management, airport users including any airlines or FBOs, any applicable environmental agency representatives, any potentially affected utilities, and the representative from the FAA Airports Division.

The predesign conference should discuss the scope of work and the design parameters peculiar to the project, including items such as design aircraft, local conditions and materials, use of recycled materials, design options, use of FAA standards, and any materials furnished by others.

b) Design Review Meetings

Depending on the complexity of the project, additional design review meetings may be necessary to ensure that all aspects of the project have been incorporated into the plans, specifications, and estimate of cost. Design review meetings are generally held when the project is 30%, 60%, and 90% complete but should be scheduled as needed.

c) Engineer's Report

An engineer's report should be submitted with the plans and specifications and should detail the decisions of the design review meetings and some of the critical design factors. A typical engineer's report will include the following:

- Scope of proposed project;

- Design alternatives and the reason for the selected design;

- Pavement design: typical sections, allowable loadings, design aircraft, etc.;

- Drainage design computations;

- Lighting design and explanation of equipment;

- Explanation of any deviations from FAA standards;

- Reasons for any modifications to construction standards;

- Description of any non-federally funded work to be included in the contract;

- Engineer's estimate of construction/contract cost; and

- Provisions included in the plans and specifications to carry out environmental mitigation.

- actions resulting from the environmental coordination process.

Construction Plans

One of the most important keys to a successful construction project is to have a well-thought out plan for construction. Following is a list of some typical components of an airport construction plan set:

- Title sheet and drawing index,
- Project site plan and survey control,
- Construction safety and operations plan,
- Phasing plan,
- Project quantities,
- Soil borings,
- Typical sections,
- Erosion control plan,
- Removals plan,
- Grading and drainage plan,
- Drainage details,
- Existing or proposed contours,
- Plan and profile sheets,
- Pavement marking plan and details,
- Cross sections,
- Electrical plans and details,
- Fencing plan, and
- Landscaping details.

Construction Specifications

The project's specifications supplement the plans and describe in greater detail the requirements of the materials to be used, what testing and quality assurance methods are required, and how the work will be measured and accepted for payment. The project specifications should also state the time allowed for project completion, labor and wage rate requirements, civil rights requirements, and any other technical and legal requirements of the contract.

Projects funded under the AIP must conform to the guidelines established in FAA AC 150/5370-10A, *Standards for Specifying Construction of Airports.* As stated within this advisory circular, many of the standards are not to be incorporated verbatim, but rather are to provide options to the engineer when preparing a specification to ensure that sound engineering judgment is applied to consider the unique conditions of the project (*12*).

In certain instances, state specifications are implemented. On approval by the FAA, these state specifications may be incorporated in construction contracts by reference. The state specifications must be readily available to all parties interested in such contracts.

FAA airport field representatives, designated by regional offices, have the authority to approve modifications to standards if the modifications provide acceptable levels of safety, economy, durability, and workmanship and are necessary to meet local conditions.

Construction Safety and Operations Plans/Safety Manuals

Airport expansion projects often require the presence and movement of construction labor and equipment near critical airport traffic areas. The proximity of construction activities and airport operations needs to be carefully considered during the planning of construction site layouts in order to minimize and eliminate all potential construction-related hazards to aviation safety. The FAA has issued guidance to airport operators in the form of AC 150/5370-2E, *Operational Safety on Airports During Construction* (*13*). Some of the highlights of this advisory circular are presented in this subsection.

Basic Safety Plan Considerations

The airport operator should determine the level of complexity of the safety plan that is necessary for each construction project and its phases. Details for a specified safety plan, or requirements of a contractor-developed safety plan, should be discussed at the predesign and preconstruction conferences and should include the following items, as appropriate:

- Actions necessary before starting construction, including defining and assigning responsibilities;

- Basic responsibilities and procedures for disseminating instructions about airport procedures to the contractor's personnel;

- Means of separating construction areas from aeronautical-use areas;

- Navigational aid requirements and weather;

- Marking and lighting plan illustrations; and

- Methods of coordinating significant changes in airport operations with all the appropriate parties.

Safety Plan Checklist

To the extent applicable, the safety plan should address the following:

- Scope of work to be performed, including proposed duration of work;

- Runway and taxiway marking and lighting;

- Procedures for protecting all runway and taxiway safety areas, obstacle-free zones, object-free areas, and threshold-citing criteria, including limits on equipment height and stockpiled material;

- Areas and operations affected by the construction activity, including possible safety problems;

- NAVAIDs that could be affected, especially critical-area boundaries;

- Procedures and equipment, such as barricades (identify type), to delineate closed construction areas from the airport operational areas, as necessary;

- Limits on construction;

- Required compliance of contractor personnel with all airport safety and security measures;

- Location of stockpile construction materials, construction site parking, and access and haul roads;

- Radio communication procedures with the ATCT or other parties;

- Vehicle identification;

- Trenches and excavations: distances from pavements, cover, and slope requirements;

- Procedures for notifying RFF personnel if water lines of fire hydrants must be deactivated or if emergency access routes must be rerouted or blocked;

- Emergency notification numbers and procedures for medical and police response;

- Use of temporary visual aids;

- Wildlife management;

- Foreign object debris (FOD) control provisions;

- Hazardous material management;

- NOTAM issuance; and

- Procedures for locating and protecting existing underground utilities.

Safety and Security Measures

Airport operators are responsible for closely monitoring tenant and construction contractor activity during the construction project to ensure continual compliance with all safety and security requirements. Airports subject to 49 CFR 1542, *Airport Security,* must meet standards for access control, movement of ground vehicles, and identification of construction contractor and tenant personnel. Some keys areas of consideration for safety and security are:

- Vehicle operation, marking, and pedestrian control;

- Construction vehicle equipment parking;

- Radio communication training;

- Fencing and gates; and

- Traffic control.

Notification of Construction Activities

To maintain the desired levels of operational safety on airports during construction activities, the safety plan should contain the following notification actions:

- NOTAMs. The airport operator must provide information on closed or hazardous conditions on airport movement areas to the FSS so it can issue a NOTAM. The airport operator must coordinate with tenants and the local air traffic facility the issuance, maintenance, and cancellation of NOTAMs about airport conditions resulting from the construction activities. Only the airport operator or an authorized representative may issue or cancel NOTAMs on airport conditions. (The Board's airport manager designee/operator is the only entity that can close or open a runway.) The airport operator must file and maintain this list of authorized representatives from the FSS.

Any person having reason to believe that a NOTAM is missing, incomplete, or inaccurate must notify the airport operator.

- ARFF Notification
- Notification to the FAA

D.   Airport Construction Activities

Preconstruction Conference

A preconstruction meeting, convened and conducted by the sponsor or an authorized agent, should be used to discuss various items including operational safety, testing, quality control, security, safety, labor requirements, and environmental factors. This meeting, among all parties affected by the construction, should help anticipate potential problems that may result from the project construction and develop solutions to avoid or minimize them.

Participants will vary according to the effect that the proposed construction will have on the operation of the airport. As applicable, the sponsor should invite the sponsor's engineer, the resident engineer, airport management, the responsible testing company, the prime contractor and subcontractors, airport users such as FBOs and pilot associations, affected utilities, applicable environmental agencies, and representation from the FAA.

General discussion topics at the preconstruction meeting will consist of the following:

- The scope of the project and the sequence of operations;
- The relationship of the resident engineer to the sponsor and the authority of the resident engineer
- to suspend operations, wholly or in part, when safety violations or nonconformance to contract specifications are noted;
- The relationship between the FAA and the sponsor;
- Identification of the contractor's superintendent and his or her authority and responsibility;
- Work schedule, the need to perform certain items at various stages of the project, and operational or safety problems that might arise because of the proposed construction;
- Issuance of the notice to proceed and contract completion requirements;
- Safety and security requirements during construction (as discussed previously); and
- The need for continuing vigilance for potential or existing hazards relative to any of the following items:
  - Open trenches and settlement of backfill adjacent to pavements,
  - Pavement "drop-offs" or "lips" at tie-in areas,
  - The obliteration, inadvertent relocation, or disturbance of the marking and/or lighting of a displaced threshold or marking or lighting of closed runways and taxiways,
  - Damages to existing lighting, markings, or NAVAIDs by construction forces,

    – Spillage from vehicles on active airport pavements,

    – Temporary stockpiling of material for an extended period of time,

    – Contractor vehicular traffic through restricted critical areas of NAVAID facilities and the airport operating areas, and

    – Dust and erosion control and other environmental factors.

FAA Form 7460-1

FAA Form 7460-1, Notice of Proposed Construction or Alteration, must be submitted to the FAA to give notification of construction proposed on airports that are open to the public. Form 7460-1 must also be filed for any construction or alteration proposed on an airport that is available for public use.

Once the form has been submitted to the FAA, a determination will be made as to whether the proposed construction or alteration is acceptable. Generally, the notification must be sent to the FAA regional/airports district office 30 days before the start of construction or the filing of a construction permit, whichever occurs first. The FAA will do an aeronautical case study to evaluate the impact to the airport and, once completed, will issue its determination. The possible outcomes of the aeronautical case study are as follows:

• **No Objection.** The subject construction did not exceed obstruction standards and marking/ lighting is not required.

• **Conditional Determination.** The proposed construction/alternation would be acceptable contingent upon implementing mitigation measures (marking and lighting, etc.)

• **Objectionable.** The proposed construction/alteration is determined to be a hazard and is thus objectionable. The reasons for this determination are outlined to the proponent.

Quality Control

The FAA has issued guidance for quality control of airport grant construction projects in the form of AC 150/5370-12A (*14*). This AC establishes guidelines and standards for construction projects and states the responsibilities of the sponsor, engineer, and FAA project manager.

Typically, general aviation airports do not have the staff or expertise to perform the construction supervision and testing required for determining acceptability and quality of construction. Most general aviation airports will retain a consulting engineering firm to represent the sponsor and have the responsibility for reporting on the acceptability and quality of the work. During construction, this responsibility is typically that of the resident engineer. The resident engineer must have field experience in the type of work to be performed; be fully qualified to make interpretations, decisions, field computations, and the like; and have the knowledge of testing requirements and procedures. The resident engineer must have the authority to reject both unsatisfactory workmanship and unsatisfactory materials. The primary duties of the resident engineer are to

• Check activities to ensure compliance with the plans and specifications and inform the contractor of any work that is in noncompliance.

- Ensure that all testing required by the specifications is performed. All commercially produced products, such as pipe and reinforcing steel, that are used on the project should be accompanied by numerical test results or a certification from the manufacturer that the material meets the applicable standards.

- Visit the testing laboratory to determine if it has the equipment and qualified personnel necessary to conduct the tests required by the specifications.

- Ensure that tests are performed at the frequency stated in the specifications. Determine when and where tests will be taken and witness tests. If not indicated in the specifications, a sufficient number of tests should be taken to verify that the construction is acceptable.

- Review test reports and certifications for conformance to the specifications. Each test report for material in place should, at a minimum, contain the following:

    – Test performed and date,

    – Applicable standard or project specification,

    – Test location,

    – Test result,

    – Action taken on failing tests, and

    – Locations and adjusted contract price when statistical acceptance procedures are specified or when provisions allow for reduced payment.

- Maintain a file of test reports and certifications.

- Inform the contractor of deficiencies so corrections can be made and retesting performed prior to covering any substandard work with additional material.

- Document quantities of materials used on the project by actual measurements and computations in a field book or on computer printouts retained in a folder.

- Maintain a set of drawings that can be used to document "as constructed" conditions.

- Review payment requests from the contractor.

- Review and inspect construction conformance to erosion control plan. Document any problems and communicate corrective actions necessary to contractor.

- Maintain a project diary that documents work, location, weather, equipment, personnel, and other related details.

- Handle change orders, time extensions, payments, and liquidated damages.

Project Completion and Closeout

Once the construction project has reached substantial completion, a final inspection is generally scheduled with the sponsor, engineer, contractor, airport management, and applicable FAA representatives. The final inspection should give all parties an opportunity to walk the project and identify any final corrective actions that must be completed in the development of a punch list.

Upon substantial completion, it is also necessary to flight-check any new or adjusted navigational aids and to test the operation of lighting and other visual aids.

The sponsor or authorized representative may elect to release or reduce any monies retained to the contractor, depending on the work identified for completion on the final inspection. The contractor is generally required to submit an affidavit of wage-rate compliance. The engineer should develop a list of variations in quantities (with explanations) and a materials book that documents the testing of materials and certifications received during construction.

VI.   PUBLIC RELATIONS

A.   Marketing and Advertising

Developing public relations is one of the most important aspects of the job of an airport manager. An airport is a valuable community resource and economic driver for the community. Promoting it in the community and building relations on and off the airport is critical to its successful operation. Whether communicating facility goals and vision, dealing with negative opinions about the airport, or addressing emergency situations, the public relations component of managing an airport cannot and should not be avoided. This chapter will address the public relations process and marketing as it relates to small airport management.

Developing a Marketing Plan

a)   Objective

A marketing plan can be a powerful tool for developing public relations and providing strategic direction for an airport. Formal marketing plans benefit airport managers in that they evaluate opportunities and problems, identify customers, assess competition, set priorities, and measure successes. This section will provide a general overview of some of the components essential to the development of a small airport marketing program.

Identifying the objectives of a small airport marketing plan is an important first step. Objectives may vary between airports and are tied closely to overall organization goals and airport vision. Examples of objectives might be to increase overall utilization of the airport facility, create an image, or attract businesses to the airport. In general, meeting the objectives of successful marketing plans will usually require that the airport administration and businesses at the airport be marketing oriented and focused on the customer.

b)   Market Analysis

Conducting a market analysis for the purpose of developing a small airport marketing plan includes evaluating airport products, services, and facilities; assessing competition; and identifying target markets. The plan should take careful inventory of the airport and what differentiates it from neighboring facilities that might be considered competitors. A part of this evaluation should examine the role of the airport in the community and the vision and mission established through strategic planning of the airport.

The analysis might identify the airport's customers, including tenants, transient aircraft pilots, tourists, or the local community. The marketing plan might also identify segments of the market to focus efforts on, such as business customers, recreational customers, or the community. Within these segments, desirable attributes or preferences can be identified and careful

consideration given to how the airport now serves these segments of the market. As an example, if the analysis identifies business aviation as a market segment, desirable attributes might include having excellent instrument approaches or even clean restrooms. The airport manager can then assess current conditions or set priorities based on identified attributes.

A good marketing plan will also allow for a detailed examination of the strengths, weaknesses, opportunities, and threats (SWOT) of the airport. It may be helpful to organize this assessment in relation to the identified target markets. As in the previous example, if business aviation is a target market, then the SWOT analysis should break down how the airport currently serves this market and list the strengths, weaknesses, opportunities, and threats to serving the business aviation segment.

Developing Marketing Strategies and Priorities

Marketing strategies for small airports vary widely, from simple to complex depending on the resources available to a particular airport. An airport marketing plan should identify and list these strategies, which may include materials such as brochures, tours, print advertising, events, press releases, direct mailings, or a website. These are just a few potential airport marketing strategies but by no means the limit. Airport managers should be innovative and list all potential ideas, focusing on attributes of the airport, community, or geographical region that may lead to new strategies.

After compiling the potential marketing strategies it is important to prioritize these efforts and their frequency. For example, if the plan identifies the strategy of publishing an airport newsletter, the airport manager can rate this as a high marketing priority to be disseminated quarterly.

Developing marketing strategies, prioritizing, and determining frequency of application will assist the airport manager in implementing the plan toward effectively meeting plan objectives. Small airport budgets do not usually allow for nor is it normally practical to implement all potential marketing strategies identified in a small airport marketing plan. Prioritizing strategies and scheduling implementation will help managers phase in marketing techniques and adjust budgets accordingly. Often there are few costs involved and techniques are ongoing.

Measuring Success

It is typically very difficult to measure the effectiveness of a small airport's marketing program. A good marketing plan, however, will attempt to measure the effectiveness of implementing marketing strategies and how effective these strategies are toward meeting objectives. A system of monitoring and surveying customers about these programs may be helpful. Other indicators of success can be measured, such as monitoring changes in the number of based aircraft or operations. Determining these indicators depends largely on what strategies are implemented to reach which target market. An airport manager should also review plan implementation and effectiveness periodically to assess any changes in objectives or overall marketing goals of the airport.

Community Relations

An airport is an important part of any community, and as part of the public relations effort, airport managers must understand the needs of the community and build relationships with the community as a customer and stakeholder in the facility. Airport representatives should

provide open communication not only with primary users of the airport and tenants but also with community groups, political leaders, neighbors, and others.

When communicating the benefit of the airport to citizens of a community, it is important to describe the elements of the airport that make it valuable. The community should be made aware of the many valuable uses of the airport such as air ambulance, firefighting, aerial agricultural spraying, search and rescue, and law enforcement. Other commitments to the community might include the safe operation of the airport, support of a full range of aviation activities including medical transport, business access, cost-effective management of the airport, and community compatibility. Airport management should be aware of community needs and strive for environmental stewardship by minimizing the impacts and intrusion of noise, planning for compatible land use development, and being a "good neighbor." An airport can enhance the image of the community by providing first-class facilities.

An airport manager should actively engage in community outreach. Presenting an airport program to local civic organizations is an excellent opportunity to interact with the community and instill pride in the community about the many benefits of the airport. Another way to reach out to the local community is through the schools. Bringing young people to the airport for tours or other aviation programs is a rewarding way to educate the community. Other activities should be explored as well, such as holding an Aviation Career Day at the local high school.

B. Media Relations

An airport public relations program must address dealing with a variety of media sources. Airport representatives may benefit from establishing a liaison with local print, television, and radio media outlets. The airport manager is the ideal point of contact with the media and will likely be the most informed and authoritative speaker on airport issues. It may be advantageous to be proactive with the media in reporting airport news. A positive relationship with media representatives and reporters through personal contact will help the airport manager deliver publicity to the public and determine what is newsworthy. Preparing press releases for a newsworthy event or action will generate interest and help ensure that accurate news is reported. In preparing news releases, the airport manager should be factual and concise. The AOPA has a variety of guidance materials and examples of press releases available.

C. Public Relations

Public relations is primarily about communication. Marketing, advertising, and community relations are all linked to communicating what the airport is and does that may affect the public interest. Understanding the airport's role in the community and the social and economic impacts of the airport will help the airport manager communicate with the public. Effective public relations programs will communicate the mission, vision, goals, and values of the airport.

Perception of the Airport in the Community

A positive perception of the airport in the community is a valuable thing. Airport managers should take time to research the community's opinions about the facility. All too often vocal opponents of the airport will view it as a place for hobbyists. Community leaders and elected officials will sometimes view the airport as a noise-generating "playground" for recreational users, and therefore expensive and unneeded. A solid public relations program that involves the

community will help educate the public on the value of the airport to the entire community and will help counter negative public opinions.

Public relations should not only focus on public opinion but also on political action. Elected local, state, and federal officials often make decisions on issues that affect airports. Building relationships with political officials and keeping them informed and apprised of airport positions is important. Such communication can be accomplished with direct, concise correspondence or with personal meetings. An elected official may or may not have any knowledge of or interest in airport issues. Airport representatives should provide facts that will help guide informed decision making.

Public Events

Inviting the public out to the airport for various events can be an effective way of building support for an airport. Hosting airport tours, events, and air shows helps raise community awareness and foster goodwill. It is common for small airports to host an annual fly-in breakfast. Airport management will often support this activity, which may be put on by an airport-based user group such as a flying club, civil air patrol, or experimental aircraft association chapter. Air show events are quite popular with the public and can attract thousands of visitors to an airport. These shows often include aircraft aerobatic performances, aircraft static displays, and other ground events. Air shows will generally require an FAA waiver coordinated through the local FAA flight standards district office. Airport management should always have on hand an up-to-date copy of any FAA waiver affecting the operation of the airport.

Every air show is organized differently but clearly takes an immense amount of time and coordination to plan, organize, and conduct. Air show sponsors will need to coordinate all activities with the airport manager. The primary consideration of any public event or air show should be public safety. The required planning and coordination for an air show will take at least 12 months.

Some of these operational considerations include:

- Safety and security,
- Aircraft parking,
- Filing of NOTAMs,
- Air traffic control,
- Airspace requirements,
- Automobile parking,
- Pedestrian flow of traffic,
- Emergency planning,
- Communications, and
- Waiver provisions.

D.   Additional Resources

The ACRP is funding several projects related to airport marketing including Project 01-04, "Marketing Techniques for Small Airports," which will be published in 2009. In addition, the

American Association of Airport Executives (AAAE) offers a wide range of publications pertaining to airport marketing and community relations through the information library on its website (www.aaae.org). Online access to the publications is limited to AAAE members, although nonmembers may purchase the documents. The AOPA also offers several community relations–oriented documents through its website (www.aopa.org). Accessing the AOPA publications online is not restricted to AOPA members.

VII. AIRPORT EDUCATION AND TRAINING

A. Developing a Training Program

A successful staffing transition for any organization involves a well-structured orientation and training program. For an airport, this includes management, employee staff, airport tenants, contractors, and others utilizing the airport on a daily basis.

Management should be introduced to and well versed in the airport's policies and procedures that outline the leadership responsibilities for daily management. Copies of any legislative acts, statutes, ordinances, bylaws, employee contracts, and any other guidance should be close at hand for review. This documentation should also include the airport's operating plans—such as the airport emergency, security, snow removal, and safety plans—that may require swift and effective action during an incident.

Management will also need to be familiar with the airport's layout and airport tenants' operating requirements. Because circumstances may cause both of these to change, a successful airport manager spends time on the airport's property and frequently communicates with the tenants to provide strong management practices to meet changing demands. Introduction to the airport's financial structure is important as well. Management should understand the revenue and expense resources and how the airport has historically met these demands. The airport's capital improvement program and future planning thoughts should be explained as part of the manager's initial education process.

The Board or operator is also required to properly orient and train his or her employees. As part of the initial human resources process, the employee should be provided copies and explanations of the airport's policies and procedures, which typically cover harassment, drug/ alcohol use, safety policies, and employment agreements.

Employees will need to be introduced to the airport's layout and tenant structure and operating requirements. Because the airport operating plans provide the basis for an employee's job description, providing written copies and explanations of the procedures is imperative to ensure effective performance. Once procedures have been explained, the next step is to provide for efficient on-the-job training. The airport environment is unique due to site-specific conditions, aircraft communications, high-voltage electrical systems, and specialized airfield maintenance equipment. A new employee should be provided a structured training program that is guided by an experienced individual for each particular area. Besides relying on airport staff, other training resources may include the state aeronautics department, the AAAE, and neighboring airports.

As an airport owner or operator enters into a lease or contract agreement with a tenant or contractor, special provisions should be made for airport property orientation and familiarization with operating procedures. A common mistake is to provide this only to those signing the agreement, with no assurance that it will trickle down to the employees who also require the same

education. Airport operating boundaries, communications, safety and security procedures, and vehicle and personnel requirements should be included in a concise educational program to ensure safe and efficient airport operations.

B.   Developing an Airport Orientation Program

Generally, smaller airports are governed by elected officials or by individuals who have volunteered to assist with the airport's leadership and management decision-making process, or both. Often these individuals do not have a great deal of airport management expertise and may not be familiar with the specific operations at the airport. Each airport owner or operator should prepare a concise airport orientation program to welcome and educate these individuals who will be involved with processing key decisions.

The orientation program should cover the airport governance structure, include a diagram of the management structure and governing authority that clearly shows the airport's chain of command, and describe the airport's history and how it was established. Copies of any legislative acts, local statutes, ordinances, bylaws, and board members' responsibilities should be included as well.

The orientation program should invite the new members on a brief tour of the airport to provide first-hand familiarization with facilities; point out the physical property boundaries of the airport, the runway layouts, and special airport assets pilots find attractive; educate the members on the use of the buildings and the tenants that use the airport; and point out the reasons tenants prefer this airport and why those reasons are important to the vitality of the airport's long-term operation.

The orientation program should also detail the airport's financial status; explain the current budget, revenue and expense sources, and the capital improvement program; and provide any relevant airport policies and procedures that will help with this education and future decision-making process.

C.   Performance Measurement and Benchmarking

Airport managers are continually faced with the ongoing challenge of improving performance. Across the country, they are discovering new approaches to increasing efficiencies within their own airports. Benchmarking is a tool that identifies "best practices" by making process comparisons both inside and outside an airport.

Competitive factors are driving the growth of benchmarking. No longer is it acceptable to do one's best, or to do it better than before. This section will discuss benchmarking and how it can be used by airports to track progress and note improvements.

Using benchmarking techniques, airports can share nonpublic performance information to identify the operational processes that really work for them. They begin by measuring each other's operating data, identifying the best performer in a group, then adopting the practices that improve their performance the most. Benchmarking provides the participants with the guidance they need to make informed business decisions.

In addition to using benchmarking for improvement, managers can use it to understand the techniques they are using and their effectiveness. Benchmarking can create a nonthreatening environment to review all the possible areas for improvement.

Benchmarking is both a project and a process. As a project, it is a one-time event, but as a process it is continual and integrated into the daily operations of the airport. Every airport will have some activities that fall short of highest performance. Measuring performance is the first step in benchmarking. By identifying the gap between a particular airport's performance and that of others, processes can be identified to make improvements and measure progress.