

ACRP

SYNTHESIS 3

AIRPORT
COOPERATIVE
RESEARCH
PROGRAM

General Aviation Safety and Security Practices



A Synthesis of Airport Practice

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AIRPORT COOPERATIVE RESEARCH PROGRAM

ACRP SYNTHESIS 3

General Aviation Safety and Security Practices

A Synthesis of Airport Practice

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SUBJECT AREAS
Aviation

Research Sponsored by the Federal Aviation Administration

TRANSPORTATION RESEARCH BOARD

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AIRPORT COOPERATIVE RESEARCH PROGRAM

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

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

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

The ACRP benefits from the cooperation and participation of airport professionals, air carriers, shippers, state and local government officials, equipment and service suppliers, other airport users, and research organizations. Each of these participants has different interests and responsibilities, and each is an integral part of this cooperative research effort.

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Once selected, each ACRP project is assigned to an expert panel, appointed by the TRB. Panels include experienced practitioners and research specialists; heavy emphasis is placed on including airport professionals, the intended users of the research products. The panels prepare project statements (requests for proposals), select contractors, and provide technical guidance and counsel throughout the life of the project. The process for developing research problem statements and selecting research agencies has been used by TRB in managing cooperative research programs since 1962. As in other TRB activities, ACRP project panels serve voluntarily without compensation.

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FOREWORD

*By Staff
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Airport administrators, engineers, and researchers often face problems for which information already exists, either in documented form or as undocumented experience and practice. This information may be fragmented, scattered, and unevaluated. As a consequence, full knowledge of what has been learned about a problem may not be brought to bear on its solution. Costly research findings may go unused, valuable experience may be overlooked, and due consideration may not be given to recommended practices for solving or alleviating the problem.

There is information on nearly every subject of concern to the airport industry. Much of it derives from research or from the work of practitioners faced with problems in their day-to-day work. To provide a systematic means for assembling and evaluating such useful information and to make it available to the entire airport community, the Airport Cooperative Research Program authorized the Transportation Research Board to undertake a continuing project. This project, ACRP Project 11-03, "Synthesis of Information Related to Airport Practices," searches out and synthesizes useful knowledge from all available sources and prepares concise, documented reports on specific topics. Reports from this endeavor constitute an ACRP report series, *Synthesis of Airport Practice*.

This synthesis series reports on current knowledge and practice, in a compact format, without the detailed directions usually found in handbooks or design manuals. Each report in the series provides a compendium of the best knowledge available on those measures found to be the most successful in resolving specific problems.

PREFACE

This synthesis study identifies current practices in safety and security at general aviation airports. It reviews resources used by the general aviation community in the development of safety and security programs, funding sources and issues that determine the amount of money spent on such programs, and describes current practices that general aviation airports use to keep their facilities safe and secure.

Information was collected from survey questionnaires distributed to individual airports and fixed base operators (FBOs), a literature search, and documents provided by selected airports, FBOs, and industry trade associations. Follow-up interviews, personal experience, and industry contacts were also incorporated where appropriate.

Craig Williams, Project Manager, RS&H, Naperville, Illinois, collected and synthesized the information and wrote the report. The members of the topic panel are acknowledged on the preceding page. This synthesis is an immediately useful document that records the practices that were acceptable within the limitations of the knowledge available at the time of its preparation. As progress in research and practice continues, new knowledge will be added to that now at hand.

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GENERAL AVIATION SAFETY AND SECURITY PRACTICES

SUMMARY

Over the past 40 years, safety in the general aviation arena has greatly improved. The reasons are many and include improved aircraft reliability, pilot training enhancements, and better weather reporting capabilities. One often overlooked contributor to this safety record is the contribution made on the ground by general aviation airport operators, as well as those fixed base operators (FBOs) who service general aviation aircraft. In addition, often included as an aspect of aviation safety but different in both its planning and response, is airport security. Since 2001, airport security has been the primary concern within the airport community. Although significant regulatory focus is justifiably placed on protecting commercial aviation airport facilities, these facilities are but one small element of the entire nationwide airport system. Those airports serving commercial aviation number fewer than 600, or approximately 3% of the 19,800 total landing facilities throughout the country.

The objective of this synthesis report is to identify current practices in safety management and security operations at general aviation airports and FBOs. Through the use of a survey of individual airports and FBOs, this report identified current practices and highlights unique, low-cost ideas that may be in use at one airport, but transferable to others. From a total of 60 surveys distributed, 53 responses were received for a response rate of 88%. Additional information for this synthesis report was collected during a literature search, and from documents made available by selected airports, FBOs, and industry trade associations. Also, the survey identified resources used to develop safety and security materials at general aviation airports. Additional information, taken from the author's personal experiences, follow-up interviews with survey respondents, and other industry contacts are, where appropriate, shared in the report.

It was found that federal regulation of general aviation airports is limited and often deferred to the states. More than half of the states have licensing and inspection requirements for general aviation airports. These requirements often mirror those imposed on commercial service airports under Title 14, Code of Federal Regulations (CFR), Part 139, which most of the survey respondents use as a basis for establishing safety plans at their airports. Airports understand and appreciate the importance of safety planning and often extend this to emergency response and wildlife control. Training is taken seriously at general aviation airports, and both airports and FBOs use initial and recurrent training to ensure the safety of the ramp environment. The FBO community is advancing this effort by developing computer-based training and best management practices for common operations on the ramp.

It is only within the past five years that airport security has come to mean more to general aviation than ensuring that the aircraft is secured to prevent theft. Resources developed by a number of federal, state, and local government agencies and industry organizations are available to the general aviation airport community, and many airports are taking advantage of these resources to implement a more structured security program at their facility. Airport security is also not limited to airports. FBOs, corporate business aircraft users, and other tenants are realizing the importance of securing the entire general aviation system. Airports are also expanding the universe of organizations available to help them secure the airport, and frequently enter into agreements with the local emergency response community, federal and state law enforcement agencies, or other entities that can participate in an airport operator security program.

INTRODUCTION

BACKGROUND

There is a phrase popular in the airport community that states, “If you’ve seen one airport, then you’ve seen one airport.” It is used to highlight the differences and variations between airports across the country. However, although there are differences from airport to airport, there are also opportunities to share ideas and harmonize some of the operational practices at these airports. This report seeks to further the ACRP’s tenet of developing “near-term, practical solutions to problems facing transportation agencies” by identifying current safety management and security operations practices at general aviation airports.

General aviation is often viewed as an all-encompassing term meaning all aviation activity that is not military or commercial airline related. This view however is too broad to provide a clear understanding of the breadth of general aviation in serving the nation’s transportation system. According to the FAA, there are 19,847 landing facilities throughout the country. Of those, 5,261 are public-use and 573 of the public-use airports are served by commercial air carriers and certificated by the FAA. In the United States, the overwhelming majority of those airports are used solely by the general aviation community. This community is diverse and flies “for a wide variety of purposes, including business/corporate, personal/family transportation, training, medevac air ambulance, transporting medical supplies, emergency services, rescue operations, wildlife surveys, traffic reporting, agricultural aviation, fire-fighting, and law enforcement” (GA Serving America, www.gaservingamerica.org). Those airports labeled as exclusively general aviation airports accommodate more than 200,000 based aircraft and are typically served by more than 3,600 fixed base operators (FBOs) located at those airports. Many of those airports are small facilities that have no FBOs, whereas others may have multiple FBOs on the airfield.

Maintaining a safe and secure general aviation system is the goal of everyone involved in general aviation. Airport safety and security are two important, but operationally different functions. Depending on the individual’s point of view, safety and security can have different connotations. The pilot views safety as the successful completion of a flight. Those who fuel aircraft view safety as a refueling operation completed without incident. The airport operations staff may view safety as a runway and taxiway system free and clear of all danger. Security has a narrower focus, but is equally important—the

prevention of unauthorized access to aircraft and different areas of the airport. It is dependent on every person at the airport, whether they are an employee, tenant, or transient user, to maintain a safe and secure aviation facility.

Some safety practices overlap with security and vice versa; however, the intent and purpose and therefore the development and implementation of those practices are divergent. One example is airport fencing. When used to prevent wildlife from entering the airport it performs a safety function. When installed to prevent unauthorized access to aircraft by individuals it serves a security function.

OBJECTIVES OF STUDY

The objective of the study is to identify current practices in safety management and security operations at general aviation airports. This also incorporates current FBO practices. This synthesis report will also present low-cost and easily implemented practices and ideas that may be in use at one airport, but transferable to others.

SCOPE OF STUDY

The scope of this synthesis report highlights current practices in airport safety management and security operations, and shares ideas that have been successful at different airports. The report is limited to aviation safety management and security operations at general aviation airports. For the purpose of this synthesis report, the term “safety” was narrowed to imply those practices related to the prevention of aircraft incidents or accidents. Although important, Occupational Safety and Health Administration-related safety topics are not included. The intent of this synthesis report is not to identify potential weaknesses or provide recommendations to correct any perceived deficiencies. The report is based on information collected during a literature search and from documents made available by selected airports, FBOs, and industry trade associations. In addition, a survey exploring safety management, security operations, and resources in use by various airports to develop training materials, policies, and procedures, was distributed to airports, FBOs, and those universities or colleges with flight programs. Additional information, derived from the author’s personal experiences, follow-up interviews with survey respondents, and discussions with other industry contacts, is also shared, where appropriate.

STUDY METHODOLOGY

Information used in this study was acquired through a literature and data review, a survey, follow-on interviews of survey respondents, and the author's knowledge of the subject area.

Literature and Data Search

A literature and data search was conducted to document current practices in airport safety management and security operations. This search focused on the following: (1) available documentation relevant to identifying current general aviation airport operating practices, (2) current regulations and laws in place applicable to general aviation airport security and safety, and (3) current safety practices in place at FBOs.

Survey

A survey was developed that included sections to identify resources used for information, safety and security, and questions specifically directed toward universities with flight schools. The survey also contained questions about the safety and security practices in use at airports and FBOs. The survey attempted to cover as many aspects of aviation safety and security as possible; however, given the diversity of airports and companies that received the survey, not all sections were applicable. A copy of the survey questionnaire can be found in Appendix A and a list of respondents is included as Appendix B of this report.

The survey was sent to 60 organizations representing general aviation airports, FBOs, and universities and colleges with aviation flight programs. Specifically, the survey was sent to 42 airports, 9 FBOs, and 9 universities. Airports and

FBOs initially selected by the panel were thought to be proactive in creating unique safety programs. As more information was obtained through the literature search, other airports and FBOs were added to the survey list.

As shown in Figure 1, respondents to the survey were geographically dispersed throughout the United States, with each FAA region represented. Average airport size and activity was considered, and the average based aircraft and annual operations were 320 and 127,772, respectively, with the median size being 251 and 113,104, respectively. Four of the airports were certified by the FAA as Part 139 airports, none of which had passenger air carriers serving the facility. These airports were included specifically because of their 139 certification to share their practices with other general aviation airports.

A total of 53 replies were received, an 88% response rate. The size of the airports that responded to the survey ranged from large to small, with the range from 28 to 1,124 based aircraft. FBO size was equally varied, from single facility operators to national companies with multiple locations.

Specific comments to the survey questions are included in chapters two and three. These chapters outline the findings of both the safety- and security-related elements of the survey. Because they can be categorized as both safety and security, survey findings related to resources and funding follow are included.

Interviews

Interviews with airports and FBOs were conducted based on information contained in survey responses. Additional inter-



FIGURE 1 Geographic distribution of survey respondents.

views were conducted with the NASAO and state aviation agencies. Also, the author attended a meeting of both the Airports Committee and the Safety and Security Committee of the National Air Transportation Association (NATA), which represents the interests of FBOs.

Resources Used by General Aviation Organizations for Safety and Security

There is a wealth of aviation safety and security information available through traditional media sources, the Internet, and now even through podcasts. However, very little of the available information is intended specifically for general aviation airports. The first section of the survey was designed to gather information concerning the resources used by the general aviation community. The respondents were provided with a list of different government agencies and industry associations, and asked to indicate if they used them as a resource, how often, and the usefulness of each. Survey recipients were also provided the opportunity to add other resources. Their responses were intended to determine where most of their information was required regarding general aviation safety or security.

The FAA headquarters website was shown to be the most often used resource, followed closely by the AAAE. This is not surprising given that the majority of respondents were airports. One interesting statistic is that, although more than 90% of the respondents have an Aircraft Owners and Pilots Association (AOPA) Airport Watch-type of program in place, only 65% have used the AOPA Airport Support Network website as a resource. Other resources used by survey respondents include a multitude of federal agencies websites, including the Federal Emergency Management Agency and the Department of Defense, state aviation departments, and state and local law enforcement and emergency response

agencies. Airports also receive information from their respective state aviation industry associations and a multitude of aviation-specific general-interest websites.

General aviation airport employees attend a wide variety of aviation industry training sessions for the sole purpose of gathering information regarding safety and/or security. Large industry conferences like the Aviation Industry Expo (hosted by the NATA) and the AAAE annual conference attract a large number of general aviation airports. Other training sessions include those offered by the Professional Aviation Maintenance Association, Department of Defense Joint Panel on Aviation Support Equipment, AAAE's Annual Aviation Security Summit, or Airport Safety and Operations Specialist classes or workshops held by the different regions of the FAA. An important opportunity for information gathering and sharing is an airport's state aviation conference, which is usually hosted by either a state association or the state aviation department.

REPORT ORGANIZATION

Chapter one presents background of the events that led to the initiation of the report and a description of some of the research done for its preparation. It provides a basis for the survey and introduces the reader to resources used by the general aviation community to develop safety and security programs, as well as funding sources and issues that govern how much money is spent on safety and security at general aviation airports. Chapter two describes current safety practices and also encompasses various programs airports use to keep their facilities safe, chapter three highlights the current security practices in use at general aviation airports, and chapter four summarizes the synthesis and provides recommendations for further research.

CURRENT PRACTICES IN SAFETY AT GENERAL AVIATION AIRPORTS

This chapter presents an overview of the current safety practices at general aviation airports in the United States. The overview is based on responses to surveys and follow-up interviews with those respondents, as well as conversations with other aviation practitioners. The chapter will begin with an overview of the regulation of safety at general aviation airports, followed by a summary of survey findings and examples of those low-cost and easily implemented practices that could be applied at other airports.

FEDERAL SAFETY REQUIREMENTS

Although commercial service airports are regulated under 14 CFR Part 139, the FAA does not have a regulation specifically requiring certification or licensing of general aviation airports. However, many general aviation airports voluntarily incorporate appropriate elements of Part 139 and their supporting Advisory Circulars to enhance the safety of their facilities. These include: emergency operations, fueling safety, airfield markings and lighting, wildlife control, and winter operations. As mentioned previously, four of the surveyed airports had, at one time, commercial air service. These airports still maintain their Part 139 Airport Operating Certificate and operate to those standards, but serve only general aviation or air cargo operations.

One way that FAA safety requirements are imposed on general aviation airports is through the Airport Improvement Program. This program provides grants for the planning and development of the 3,341 public-use airports that are included in the National Plan of Integrated Airport Systems. Those airports that accept grants are also accepting conditions and obligations associated with the grant assurances. These grant assurances include obligations to operate and maintain the airport in a safe and serviceable condition, develop facilities in accordance with FAA safety standards, and, among other issues, mitigate hazards to airspace.

One new safety concept gaining recognition in the United States is “safety management.” The term safety management is not a new one, but its applicability to airports is new to the airport community and is only recently being introduced in the United States. According to ICAO, a safety management system is an organized approach to managing safety, including the necessary organizational structures, accountabilities, policies, and procedures. In February 2007,

the FAA released Advisory Circular 150/5200-37, *Introduction to Safety Management Systems (SMS) for Airport Operators*. Although this document is written for those airports certificated under FAR Part 139, the concepts within the document are applicable across all sizes of airports and many segments of general aviation are already implementing a formalized concept of safety management. In June 2006, the FAA also introduced Advisory Circular 120-92, *Introduction to Safety Management Systems for Air Operators*. Its applicability is geared toward aircraft operators (airlines, air taxi operators, corporate flight departments, and flight schools).

STATE SAFETY REQUIREMENTS

How an airport is licensed and inspected varies widely among the states. Many states have granted the authority to license and inspect airports to their respective departments of aviation or aeronautics. Most states are similar to Louisiana, which registers landing facilities before they can be used. Approximately 30 states fall into this category and have licensing requirements primarily for public-use airports within their state. Others require this for private landing facilities as well. Of those 30 states that have licensing requirements, approximately 20 have a recurring inspection program. In Florida, the Florida Department of Transportation (DOT) inspects public airports before licensing or license renewal. A license is good for one year, which means that the airport is inspected annually. In Indiana, public-use landing facilities receive annual inspections, whereas private-use facilities receive an initial certificate, which is valid for the operating life of the facility. Table 1 shows those states that have licensing or inspection requirements.

CURRENT SAFETY PRACTICES AT SURVEYED GENERAL AVIATION AIRPORTS

The survey was used to determine current safety practices in use at those surveyed general aviation airports. It included 24 questions covering safety planning, fuel dispensing, training, emergency response, winter operations, driver training, and wildlife management. The topics of these questions are all relevant to general aviation airports and also provide a baseline for identifying what safety management practices are in place at these airports. Follow-up interviews were conducted with some of the survey respondents when

TABLE 1
STATE AIRPORT LICENSING REQUIREMENTS

| State | Airport Licenses | If Yes, Fee? |
|----------------|------------------|--------------------------------------|
| Alabama | Yes | None |
| Alaska | No | N/A |
| Arizona | No | N/A |
| Arkansas | No | N/A |
| California | Yes | None |
| Colorado | No | N/A |
| Connecticut | — | — |
| Delaware | Yes | N/A |
| Florida | Yes | None |
| Georgia | Yes | \$10 biannually |
| Guam | — | — |
| Hawaii | Yes | \$50 initial fee/\$10 annual renewal |
| Idaho | No | N/A |
| Illinois | — | — |
| Indiana | Yes | None |
| Iowa | Yes | None |
| Kansas | No | N/A |
| Kentucky | Yes | None |
| Louisiana | Yes | None |
| Maine | Yes | Varies: \$25–\$100 |
| Maryland | Yes | \$25 initial/\$10 renewal |
| Massachusetts | Yes | None |
| Michigan | Yes | Varies: \$25–\$100 |
| Minnesota | Yes | \$15/year |
| Mississippi | No | N/A |
| Missouri | No | N/A |
| Montana | No | N/A |
| Nebraska | Yes | None |
| Nevada | No | N/A |
| New Hampshire | No | N/A |
| New Jersey | Yes | \$15–\$35 |
| New Mexico | No | N/A |
| New York | No | N/A |
| North Carolina | No | N/A |
| North Dakota | No | N/A |
| Ohio | No | N/A |
| Oklahoma | No | N/A |
| Oregon | — | — |
| Pennsylvania | Yes | \$0–\$30 |
| Puerto Rico | — | — |
| Rhode Island | No | N/A |
| South Carolina | No | N/A |
| South Dakota | Yes | N/A |
| Tennessee | Yes | None |
| Texas | No | N/A |
| Utah | Yes | \$10 |
| Vermont | Yes | None |
| Virginia | Yes | \$100 initial/\$25 renewal |
| Washington | No | N/A |
| West Virginia | No | N/A |
| Wisconsin | No | N/A |
| Wyoming | No | N/A |

Source: National Association of State Aviation Officials. N/A = not available.

answers needed to be clarified or the respondent provided an interesting comment that warranted a follow-up telephone interview.

Airport Safety Plans

Safety planning is the cornerstone for preventing incidents and accidents, and managing any necessary response. Having a safety plan in place provides direction for those indi-

viduals required to implement the plan. All but one of the respondents reported having a safety plan in place. For commercial service airports, the minimum elements of the plan are dictated by the FAA through a requirement to have an airport certification manual under FAR Part 139. Almost all of the elements that are required for commercial service airports appear in the safety plans of the respondents.

Survey participants were provided a list of the common elements of an airport safety plan. The list represents typical chapters that would be found in a commercial service airport's certification manual as required by the FAA in Part 139, but is not representative of all topics that would be required; for example, training. All airports contacted in follow-up interviews mentioned that they received their information to develop their airport safety plans from FAA Advisory Circulars.

As Figure 2 shows, the topic areas within general aviation airport safety plans typically mirror those of commercial service airports. The item listed most frequently in all of the safety plans was fueling operations. This is most likely because some of the respondents were FBOs that provide fueling services. Least addressed was navigational aids (NAVAIDs), which could probably be accounted for because airports typically defer those issues to the FAA who, in most cases, is responsible for maintaining those facilities.

Communicating Safety

The communication of safety is necessary in establishing a culture of risk awareness. All of the organizations reported that they conduct safety training for their employees at the start of their employment, and follow that up with some form of a recurrent training program. The training topics may vary based on the airport's location and special considerations, but driving on the airport, air traffic control tower communications, and security awareness are three of the most common. One airport reported instituting a mandatory monthly training requirement. This training is required for the airport's four employees and covers aviation safety topics as well as Occupational Safety and Health Administration safety. One of the respondents summed up the importance of communicating safety by stating that the industry needs to take time to show new employees around the airport and how to identify potential hazards and safety concerns.

When an incident does occur, an overwhelming majority of those organizations have meetings to discuss the incident/accident and identify ways to prevent them in the future. One of those organizations, an FBO offering air charter and line services, goes one step further by monitoring published accident/incident reports. When the FBO identifies an accident or incident that may be relevant to its organization, it is used as an example of how things can go wrong. The group then identifies ways to prevent the same sort of accident from happening at its facility.

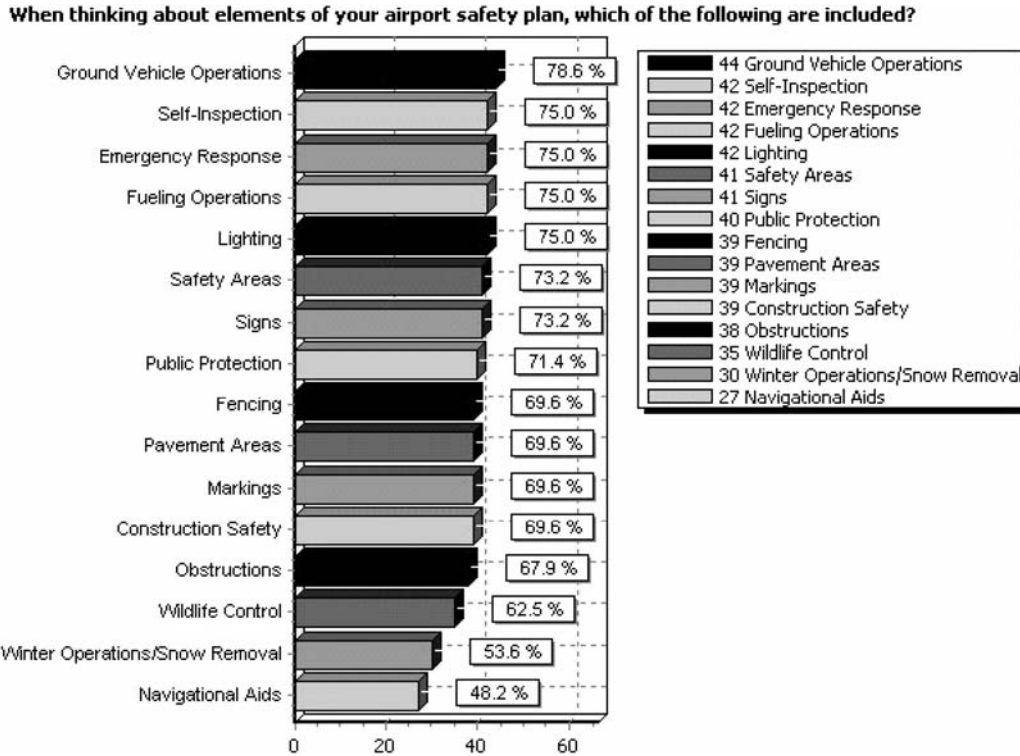


FIGURE 2 Topic areas in typical general aviation airport safety plans.

Inter-Airport Compliance Inspection

An airport self-inspection is important to identifying and fixing potential problem areas before they occur. This can be true for both safety and security. Airport safety self-inspections are important enough that the FAA has an Advisory Circular (*Airport Safety Self-Inspection* 2004) on the topic. Every topic listed within an airport’s safety plan is a candidate for a self-inspection. Appropriate airport staff regularly conducts these self-inspections and logs irregularities to be fixed as soon as practicable.

The Rhode Island Airport Corporation is responsible for managing all of the state’s airports—one commercial service airport and five general aviation airports of varying size. Landmark Aviation manages the five general aviation airports under contract to the Rhode Island Airport Corporation.

In an effort to improve safety, security, and customer service at each of the airports, Landmark implemented a peer inspection system. The manager of one airport inspects one other airport quarterly and the airports are rotated randomly from one manager to another each quarter. The random rotation works as “it keeps each of the airport managers honest because they know that next quarter there will be another new face inspecting the airport.”

The peer inspection itself is simple. Landmark Aviation developed a checklist to be used by the inspector/airport manager. The checklist includes items from the following categories with examples in parentheses: General Conditions (cleanliness); Documentation (truck records and Spill Prevention Control and Countermeasure plan availability); Fuel Farm (fuel leaks, appropriate signage, extinguishers); Fuel Trucks (condition of bonding reel, spill kits availability); Airfield (vegetation on runways or taxiways, grass height, visible obstructions); and Other

Areas (Material Safety Data Sheets up to date, first aid kits available and in order).

After the inspection the airport manager will complete the checklist and an associated Inter-Airport Priority Form. This form lists found deficiencies and prioritizes each one based on a priority schedule; that is, 1 = urgent corrective action needed; 2 = corrective action within 30 days. It is then the responsibility of the airport manager to correct the found deficiencies.

The program, in its short time, has proven successful and has increased safety at each of the five airports.

Emergency Response

Although it is not required that general aviation airports have an emergency response plan, the survey revealed that almost 90% of the respondents have one in place. Also, nearly half of the responding airports have an on-airport fire department. Given the average size of the responding airports this is expected, but is not the norm. The smaller the airport, the less likely it would be to have both an emergency response plan and an on-airport fire department.

For those general aviation airports looking to develop an emergency plan, FAA Advisory Circular 150/5200-31A, *Airport Emergency Plan* (1999), provides a good first step. The Advisory Circular outlines not only what should be included in the plan, but some helpful steps that the airport should take during its preparation. Airports also suggested contacting those agencies that would respond to an airport

emergency to establish a working relationship. Once this relationship is established, the organizations can work to educate each other to the needs and special conditions at the airport, as well as the capabilities for those organizations to respond. As the relationship develops, the airport can expand those relationships to other agencies or organizations as needed. Another matter to consider is the resources already available at the airport. Some airports have tenants that are medevac companies whose resources could be used to mitigate emergencies.

Often general aviation airports are located away from or on the fringes of a city and can be some distance from their local response agency. Additionally, general aviation airports can be home to a large number of businesses, most of which would be industrial or commercial in nature. Recognizing this, one airport put this technique to practice. Located away from town, the airport worked with its local fire department to develop a hazard map for the airport and surrounding community. Businesses with a variety of hazards can be either on the airport property or directly adjacent to the airport's boundaries and may house dangerous chemicals or potential fire hazards. The fire department assessed the surrounding area and made recommendations based on the findings. One of those recommendations was to locate a fire station closer to the airport to shorten response times. Another recommendation led to the purchase by the fire department of the equipment necessary to properly equip the fire department to respond to those emergencies that may happen on or around the airport.

An important element of emergency planning is completing exercise drills. These could be full-scale responses or tabletop exercises. Many airports conduct drills proactively to identify possible weaknesses in the emergency plan that may need improvement. One airport identified the tabletop exercise as an important accomplishment, because it helps to update records and identifies communication weaknesses. Some general aviation airports conduct full-scale emergency response drills to test their emergency plans.

At one of the small surveyed airports with an emergency plan in place the airport director stated that he believes the airport plays an important role in community emergency planning. Because of this, the airport is proactive in its community involvement, especially with the police and fire departments. The airport works with both of those departments to test emergency plans. Additionally, the airport participates with the local hospital when the hospital must complete its required emergency drill. The airport has also allowed each of these entities to use the facility for exercises. The airport manager believes that this allows the community to be more aware of the unique hazards associated with the airport and to develop a better response.

This same airport also embraces the NTSB Transportation Disaster Assistance Program. This program requires that commercial service airlines provide assistance to victims and

their families following an aircraft accident. This is done by ensuring that families are treated with respect, provided private briefings, and convey psychological support, among other things. There is no requirement that airports have a plan in place; however, proactive airports include family assistance considerations within their airport emergency plan. This particular airport embraces the NTSB program because of the culture of the surrounding community. If there is an accident on or around the airport it is followed by an attendance of the victim's extended family. For example, the airport has a plan in place to use the services of grief counselors for victims and employees immediately after an accident. However, considerations can be as simple as assigning a place outside of media view for the families of victims to grieve privately. This service is done at little cost to the airport. The NTSB has a Transportation Disaster Assistance webpage that provides useful documents and videos describing the role transportation disaster assistance plays in supporting airport emergencies (<http://www.nts.gov/Family/family.htm>). Locally, airports could contact their local chapter of the American Red Cross for ideas and recommendations.

Winter Operations

The majority of the airports surveyed have a written snow and ice control plan in place. Of those that did not the primary reason was geographic (i.e., the airport is located in an area that did not encounter winter conditions). A follow-up question asked if those airports had a committee that met to discuss winter operations and the makeup of that committee. Of those that have winter operations plans almost all have such committees. Those airports with committees usually include groups apart from airport staff, including FBOs and other major tenants. Others reported that they include air traffic control staff and their contracted snow removal company. At one airport the manager includes his Airport Advisory Committee, which is made up of airport users and tenants. This is an entity separate from the local governing body that can provide useful input and feedback to the committee.

Ground Operations and Fueling

Fueling is a safety focal point for those general aviation airports and FBOs that provide fueling services. FBOs provide fueling services at almost 75% of those airports surveyed, followed by self-fueling at 26% and airport staff at 24% (total adds up to more than 100% because some airports have multiple fueling options). However, as the airport size decreases, not all airports have FBOs as their fuel service providers and many of those airports either provide fueling services themselves or have only self-fueling at the facility. All of the respondents that provide fueling services have a training program oriented toward safety. One airport provides training classes through the city's Hazmat Officer, which is a requirement of the airport's Stormwater Pollution Prevention Program. Many airports require tenants or users



FIGURE 3 Self-fueling facility at a general aviation airport.

who self-fuel to obtain permits to self-fuel their aircraft at facilities similar to those shown in Figure 3. These permits outline the expectations, insurance requirements, and operational standards for each self-fueler. The insurance industry also contributes to fueling safety—often as a driver to ensure that pilots, FBOs, and airports comply with appropriate fueling standards. An insurance industry representative stated that the requirements for fulfillment of the insurance policy work hand-in-hand with the FAA’s safety goals.

When asked what resources they use to receive safety and security information, the FBO community specified two: (1) the corporate fueling standard operating procedures, and (2) NATA, which is the national association of aviation business service providers. The association is taking steps to promote safety for ground operations and fueling, and provides a number of programs designed to enhance safety for fueling operations and to advance the professionalism of those who conduct fueling. Through an initiative called Safety 1st, NATA has developed a variety of training programs and best management practices to enhance safety for general aviation service providers (see Figure 4). These programs include:

- Ramp Communications Safety Awareness Program—Recognizing that communication must be understood



FIGURE 4 NATA’s Safety 1st program encourages development of FBO personnel.

by all parties to be safe, NATA has developed a training program on DVD that shows aircraft marshalling techniques and hand signals. This training program promotes the concept of the professional ramp, which is comprised of professional line service technicians who are trained to perform clear, concise hand signals and accurate radio communications in any environment. These technicians also use the correct tools for the job, such as appropriate personal protective equipment and ramp tools including chocks, fluorescent cones, day/night wands, fluorescent vests, whistles, etc. The goal of this program is to teach the complexities of each technician’s job to the staff to make the ramp a safer, more professional environment.

- Professional Line Service Training Program—A video-based training program that is used to teach personnel proper and safe procedures for ground servicing and refueling, towing, and handling of general aviation aircraft and helicopters. The program is an enhancement of the original AMR–Combs Professional Line Service Training program and is used by more than 700 operators. The system will soon be computer-based.
- Operational Best Practices—NATA, through its Safety and Security Committee, is developing Operational Best Practices to provide guidance on policies and procedures for common tasks performed by FBOs. A sample Operational Best Practice for the towing of general aviation aircraft is in Appendix C. These documents will be made available to NATA members.

Another Safety 1st initiative is the NATA Safety 1st Management System, which consists of two basic components: (1) developing a customized company safety program based on industry best practices and procedures; and (2) continually monitoring risks, collecting and submitting accident and incident data for analysis, instituting recommended corrective action, and measuring improvements. As developed, the initiative has applicability across the different lines of business for general aviation to include FBOs, airports, and other tenants. Currently, there are two published best practices manuals offered by NATA to member companies; that is, one for ground operations and one for air operators (air charter). A third best practice manual pertaining to maintenance operations is currently under development.

Vehicular Operations and Runway Incursion Prevention

Operating a vehicle in the airport environment can be intimidating and dangerous. Proper training and knowledge of vehicular operation on the airport is an important factor in the prevention of vehicle and pedestrian incursions with aircraft. According to the FAA, aircraft deviations caused by vehicle and pedestrian incursions accounted for 15% of the reported runway incursions in FY 2006. Driver training is an important step in reducing vehicle and pedestrian incursions and

more than three-quarters of the survey respondents noted that they do require training for airport driving operations.

Airports must address driver training for different segments of the airport community; that is, their own employees, FBOs, and tenants. Because of the variety of backgrounds and airport operating experiences for these different segments of the aviation community, sometimes a one-size-fits-all training approach does not always work. One airport provides a safe driving manual for its employees as part of their initial and recurrent training, whereas the FBO has its own driver-training program and uses the airport's as supplemental guidance. Airports report that their training usually incorporates one or more of the following: classroom, books, videos, and airfield maps.

A follow-up question found that a high percentage of survey respondents attempt to raise the awareness of the flying community to potential runway incursion dangers on the airport. One way mentioned by a number of airports is to participate in pilot meetings and be active in the FAA's pilot safety program. One of the concerns about the validity of the runway incursion data is how much is actually reported. The survey responses indicate that most airports do report runway incursions, either to the airport director or the FAA, depending on what type of organization answered the question (airports report to the FAA and FBOs typically report to the airport). When reporting to the FAA most often it is to the air traffic control tower; however, some airports report incursions to their regional FAA representative as part of the FAA's Runway Safety Program. Other airports have hosted meetings of the FAA's Runway Safety Action Team. These meetings are designed to raise awareness of runway incursion issues for pilots, controllers, and vehicle operators, and focus not only on the general concerns of runway safety, but on specific problem spots on the airport or related airspace.

Separation of air traffic and vehicular traffic is an effective method of reducing runway incursions. One airport reported instituting new driving procedures on the airport that separated traffic from a high-profile tenant, and then they "enforced" those rules. In a follow-up interview, the airport stated that "successful implementation of a program that links airfield safety and security is only as good as the Airport Manager's desire to enforce those rules." This does not have to involve revocation of privileges or intervention by law enforcement. "Having a staff member ask a violator to explain why they did what they did is effective 99% of the time—it's the personal embarrassment factor that works. When you are implementing an airfield safety and security program, you are engaged in changing social norms—and you need to make sure that everyone takes you seriously, or your program implementation will fail." This is not an overnight process. At this airport it took two years of work to implement the program and about another year before behavior began to change. As a result however this airport has reduced its runway incidents and incursions to zero. The

implementation of this program also paid dividends with security, even though the program was developed with safety in mind.

Wildlife Hazard Mitigation

Wildlife strikes pose a real danger to aircraft. The FAA's Wildlife Hazard Mitigation website keeps track of wildlife strikes. Statistics from the wildlife database indicate that since 1990 there have been approximately 66,000 wildlife strikes across the nation, of which 97% were caused by birds. A year-by-year count is shown in Figure 5. The FAA and U.S. Department of Agriculture (USDA) have determined that the most hazardous wildlife to airport operations are gulls, waterfowl, raptors, and deer. Airport managers must be concerned about wildlife hazards in the airport environment because they can be held liable for failing to take precautions to end bird hazards. This was determined by the "Miree" case, which involved an aircraft accident in Atlanta caused by bird strikes (Dolbeer 2006). It is for this reason that the airport manager should document all actions taken to proactively address the strike potential; that the airport has a current and active habitat management plan; and that the airport manager maintain a wildlife log and files strike reports for any incident resulting in a dead animal found within 200 ft of a runway or taxiway centerline. More information can be found in FAA Form 5200-7, Bird/Other Wildlife Strike Report (updated Sep. 2006), a one-page report that can be mailed postage-paid to the FAA. Additionally, the FAA has issued Certification Alerts to Part 139 airports that are applicable to general aviation facilities and would be useful in managing wildlife hazards around the airport.

Management of wildlife is accomplished by minimizing on-airport wildlife attractants and preventing wildlife access to the airport through fencing, mowing at certain heights to minimize attractants, planting certain types of grasses or plants that do not attract wildlife, or other means. The majority of the surveyed general aviation airports do have a wildlife hazard prevention plan in place, although it was not determined if the plans were developed in accordance with FAA or USDA guidance. The FAA Airport Wildlife Mitigation Website is a one-stop resource for managing airport wildlife hazards and provides wildlife hazard management information. More detailed guidance on managing wildlife hazards on or around airports is provided in FAA Advisory Circulars AC 150/5200-32A, *Reporting Wildlife Aircraft Strike*; AC 150/5200-33A, *Hazardous Wildlife Attractants on or Near Airports*; and AC 150/5200-34A, *Construction or Establishment of Landfills Near Public Airports*

In Indiana, a 2006 report (*Reduction of Automobile and Aircraft Collisions with Wildlife in Indiana*), completed through the Joint Transportation Research Program of the Indiana DOT and Purdue University, with the cooperation of

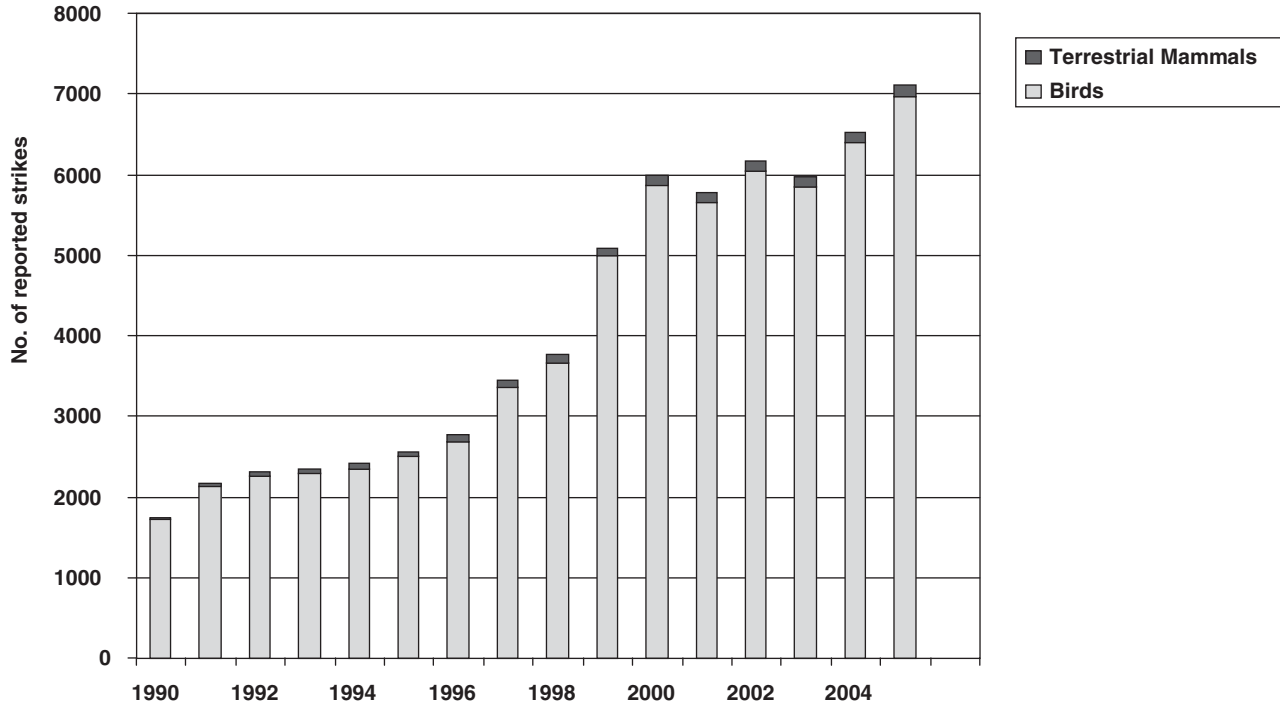


FIGURE 5 Number of reported wildlife strikes, United States 1990–2005. (Source: FAA and USDA).

the Aviation Association of Indiana, researched the dangers of wildlife by conducting an evaluation of wildlife hazards at general aviation airports in the state. The report found that “at least two types of wildlife attractants were present at each airport, but most had five to seven types” (p. 84). One of the airports surveyed used the information supplied to them after their assessment to address a geese and waterfowl problem. The airport participated in the survey because it is headquarters to the flight departments of three large corporations and accommodates significant corporate jet traffic. The assessment determined that the airport did have a bird problem and that minimizing attractants on airport property would reduce the potential problem. After deliberations with the Airport Board, the airport made the decision to stop the agricultural activity on the acreage adjacent to the runways. This decision was not an easy one because of the revenue brought in by farming; however, it was determined that the risk of a crash and the liability risk and potential departure of their three largest tenants outweighed the added revenue. Because the airport decided to stop farming on adjacent property, the geese and waterfowl no longer use the airport as a feeding and breeding ground.

SPENDING ON GENERAL AVIATION SAFETY AND SECURITY

It is widely agreed that funding for general aviation airports is limited. Of the approximately 19,800 landing facilities in the United States, only the 3,431 airports that are part of the National Plan of Integrated Airport Systems (NPIAS) are eligible for federal funding. Of those airports, 85% are considered re-

liever or general aviation airports. There are 274 reliever airports and 2,573 general aviation airports (*NPIAS Report 2006*).

In Fiscal Year 2004, of the \$3.37 billion distributed to airports as part of the FAA Airport Improvement Program, approximately \$749 million was directed toward general aviation airports. This amount does not include money directed to states that participate in the State Block Grant Program, which totaled an additional \$226 million. The majority of these airports receive an entitlement of \$150,000 per year from the FAA, with additional funding provided by the states to supplement these amounts. For example, in Florida the state allocates approximately \$140 million annually to airport development, which is by far the largest state funding program in the nation. However, this is the exception to the norm as most states provide a significantly smaller amount than Florida’s allocation.

There is pending legislation in the current Congress that would offer a funding stream to general aviation airports for security projects. The legislation calls for the TSA to initiate and complete a study on the feasibility of a program for general aviation airports for security projects. However, although security-specific federal funding has not yet been made available, states have worked to support security spending at general aviation airports. In 2004, the state of Virginia appropriated \$1.5 million to the Virginia Department of Aviation specifically for security upgrades at general aviation airports. (*General Aviation Security . . . 2004*, p. 46). Likewise, for “Fiscal Years 2002 through 2004, Georgia’s DOT Aviation Programs provided a total of \$1,174,000 in grants to general

aviation airports for fencing, lighting, and electronic card reader gates” (*General Aviation Security . . . 2004*, p. 46). Furthermore, in 2005, New York passed a major transportation initiative aimed at enhancing safety and security at general aviation airports. The act, titled the Rebuild and Renew New York Transportation Bond Act of 2005, provides \$76 million for New York’s general aviation airports, \$30 million of which is allocated toward capital security projects.

The initial reaction to the September 11, 2001 (9/11) attacks was to strengthen security in every way and to do so

as fast as possible. Spending on airport security ramped up immediately after the attacks, but the pace has since slowed as airports come to a practical understanding of the threat on aviation and the vulnerabilities to the airport environment. As a whole, spending on airport improvements is more measured today than it was in the post-9/11 security rush. Operationally, airports expend a large amount of money toward airport safety and security. As a measure of the percentage of an operating budget, smaller airports spend more on safety and security than larger airports, which would be expected given budget sizes.

CURRENT PRACTICES IN SECURITY OPERATIONS AT GENERAL AVIATION AIRPORTS

Security has undergone a significant change over the past five years, mostly in the commercial aviation arena. Since the new era of aviation security began after the 2001 terrorist attacks, there has been an ebb and flow of calls to regulate the general aviation community. Regulations have been promulgated by both the FAA and TSA to the extent of their legislative authority; however, very little regulatory activity has occurred with regard to general aviation airport security. In the initial uncertainty of the post-9/11 aviation security world many different aviation groups worked to develop security guidelines for general aviation airports. This was done in an effort to be proactive and give the airport community a baseline from which to establish its own set of operating practices. These guidelines ranged in complexity from the Aircraft Owners and Pilots Association's (AOPA) Airport Watch Program, to *Security Planning for General Aviation Airports* (2004) developed by the Florida Airports Council, to the *Terrorism Protective Measures Resource Guide* (2005) assembled by the state of Colorado's Office of Preparedness and Security, and ultimately the TSA's *Security Guidelines for General Aviation Airports* (2004). There appears to be operational and procedural overlap in all of these documents; however, each offers a unique viewpoint developed from their own perspectives.

Because security has been the primary concern over the past five years, there has also been a great deal of activity in security operations. As the industry waited for security guidelines to be developed by the TSA, many airport operators took the initiative to enhance security at their own facilities. Additionally, airports were bombarded with proposed technological solutions, many of which were of little value to the majority of the general aviation community and too costly for practical application.

This chapter will highlight some of the security operations implemented by general aviation airports and FBOs since 2001. It will begin with an overview of regulations that affect general aviation, both federally and at the state level. It will be followed by a summary of survey findings, which is broken down by category to match the topics listed in the survey questionnaire. Interspersed within each of the subsections are portions of conversations and e-mail with individual respondents designed to emphasize some of the survey findings and to introduce new concepts and share ideas.

FEDERAL SECURITY REQUIREMENTS

To date, general aviation airports have not been subjected to direct federal security regulation. The exception is the "Maryland Three," three general aviation airports located within the Flight Restricted Zone associated with the Washington, D.C., metropolitan area that were subject to a federal rulemaking. These airports, all located in Maryland (College Park Airport, Potomac Airfield, and Hyde Executive Field), must comply with unique security rules established specifically for their airport by the TSA. Most other regulations affecting general aviation security have been issued within the already established scope of authority by the FAA, which is through the regulation of pilots, flight rules, and airspace. Temporary Flight Restrictions, which are issued by means of NOTAMs (Notices to Airmen) to pilots, are another means of restricting activity at airports. The FAA issues Temporary Flight Restrictions for a variety of reasons, including protection of venues during sporting events, entertainment, and space shuttle launches.

Besides the restrictions outlined previously, general aviation airports do not fall within the security purview of the FAA. This also holds true for the TSA. The biggest step toward federal involvement in general aviation airport security was the publication of the TSA's *Security Guidelines for General Aviation Airports* (2004), which is also available on the TSA website. The purpose of the document is, "to provide owners, operators, sponsors, and other entities charged with oversight of GA [general aviation] airports a set of federally endorsed security enhancements and a method for determining when and where these enhancements may be appropriate." The guidelines were developed by a working group made up of industry participants and approved by the TSA's Aviation Security Advisory Committee.

One reason why there has been little movement toward national regulation of general aviation airport security is the realization that the depth and breadth of such laws and regulations would need to be applied and enforced equally at all 19,800 landing facilities, and how effectively these laws and regulations would reduce the perceived threat. Another factor is funding. The General Accountability Office determined in 2004 that "should TSA establish security requirements for general aviation airports, it may be difficult for airport operators to finance security enhancements independently and federal funding will also be a challenge . . ." (*General Aviation Security* . . . 2004, p. 24).

STATE SECURITY REQUIREMENTS

In the immediate post-9/11 wave of legislation and regulation most state aviation laws applicable to airports were intended to criminalize certain offenses. For example, in California the state legislature passed a law in 2002 that made it a misdemeanor offense for refusing to leave a posted airport area. Most state laws enacted since 2002 were not designed to have applicability for general aviation airports, but to strengthen the security of commercial service airports. One post-9/11 law passed by the Massachusetts legislature was a requirement that all public-use airports in the commonwealth prepare an Airport Security Plan. Additionally, the Aeronautics Commission developed a secure website in an effort to help communicate the latest in security information to general aviation airports. Similar laws have been enacted by other states as well.

Aside from the legislative efforts to mandate security at general aviation airports, one unique method for instituting security requirements is to link them to the application and receipt of state funding. In Ohio, a general aviation airport security plan is required as a condition for receiving state funds and must be submitted with an application for funding. In Virginia, the Department of Aviation developed the General Aviation Airport Voluntary Security Certification Program. Participation is not required; however, those airports that become a “Secure Virginia Airport” are eligible to receive funds for security projects and project bonus points within the Airport Capital Program project priority system.

Virginia General Aviation Airport Security Programs

The Commonwealth of Virginia, through their Department of Aviation, undertakes a comprehensive, proactive approach to airport security. They have implemented an Aviation Security Advisory Committee (ASAC), which is comprised of a diverse membership representing different agencies and associations who periodically meet and discuss aviation security issues and their impacts on the Commonwealth.

One program developed as a result of meetings of the ASAC is the development and implementation of a voluntary security program. The group wanted general aviation airports to develop security plans, but did not want to introduce an unfunded mandate. The program provides bonus points within the Airport Capital Program, which are granted to those airports that participate in the voluntary security program.

The program is a joint effort between the Department of Aviation and the Virginia State Police and seeks to encourage a general aviation airport to develop an appropriately sized security program for their facility. After developing the plan the airport conducts an annual “self-audit.” Every third year the audit is conducted by the Virginia State Police. Having a knowledgeable third-party such as the State Police conduct the audit provides valuable insight because they view security through a different perspective than the airport.

The audits cover three areas—Access Control, Territoriality, and Surveillance. For access control they are looking to see if there are measures in place that deny or restrict access to facili-

ties, and that traffic flow directs people to visible entry areas. Territoriality refers to the perception of a safe and secure airport and the audit is checking to see if the maintenance and upkeep of the property is in such a condition that it promotes a sense of legitimacy to the operation of the airport. The final area is surveillance. Criminals do not want to be seen committing a crime and the audit identifies potential weaknesses in surveillance at the airport.

The State Police is completing its first round of audits and has found some common deficiencies in the GA [general aviation] security plans. These include:

- Airports that do not have appropriate minimum standards or airport rules and regulations in place to manage tenant security.
- Lack of clear boundary delineation between the airport and surrounding property (airport does not have 100% fencing or vegetation growth encroaches airport boundaries).
- Inadequate maps or diagrams that show existing infrastructure that may not be shown on an ALP.
- Illumination of terminals is satisfactory, but lighting of fuel farms and hangars should be improved.

This program has proven both popular and successful. This voluntary, proactive approach supports a partnership between airports and law enforcement and allows the relationship to develop before an incident occurs.

CURRENT SECURITY PRACTICES AT SURVEYED GENERAL AVIATION AIRPORTS

The survey included 13 questions covering security planning, security operations, perimeter fencing, access control, airport watch programs, and risk assessments to determine current security practices in use at general aviation airports. The topics of these questions are all relevant to general aviation airports and also provide a baseline for identifying what security operations are in practice at these airports. Follow-up interviews were conducted with some of the survey respondents in instances where answers needed to be clarified or the respondent provided an interesting comment that warranted a follow-up interview.

Security Planning

In the document *Security Guidelines for General Aviation Airports* (2004), the TSA reports that, “the most efficient and cost-effective method of instituting security measures into any facility or operation is through advance planning and continuous monitoring” (p. 14). Security plans can range in size and complexity depending on the airport and threat. Typical airport security plans cover communications, access control, perimeter control, and procedures, but can include much more. Thirty-eight of the responding airports (80%) have a security plan in place and 30 of those have procedures that escalate with the threat. As was mentioned earlier, some of the states require general aviation airports to have security plans in place and some of the surveyed airports are located in those states. Those organizations that do have a security plan indicated that they designate an individual as the security coordinator for the facility.

Airports and FBOs have a wide range of resources to choose from when developing a security plan. Before the TSA finished the general aviation airport security guidelines document other industry associations, state DOTs, law enforcement agencies, and industry trade associations were busy developing their own guidance for the airport community. The largest percentage of survey respondents referenced the TSA as their primary source of material, followed by their state DOT, and AAAE. Airports hesitated early on to develop any plans in anticipation that the TSA would initiate new regulations or guidance that would become mandatory, and the airport would have to change any program previously instituted. After the TSA released their security guidelines many airports used that document, in addition to others developed over the previous two years. A smaller number hired consultants; however, one airport offered that an outside consultant is not needed if “the airport is willing to be open and look at the airport as others might look at it to get an honest appraisal of the situation. Additionally, the local law enforcement agency can be a great asset. They can tell you what they see everyday and what kind of threat environment the airport is operating in compared to the surrounding community crime and incident statistics.” Another airport found that hiring a consultant and having them host a series of initial meetings to gather input was a good method for obtaining buy-in from tenants early in the planning process that later earned the airport credibility as it was implementing elements of the security plan.

Once the security plan is in place the airports typically share their plan with local law enforcement, followed by their FBO, TSA, and the local fire department. Other entities with which airports share their plans are federal law enforcement agencies, which include the Federal Bureau of Investigation, Drug Enforcement Agency, and Immigration and Customs Enforcement; the FAA; state DOTs and Homeland Security representatives, city councils, and board members; and other major tenants, if appropriate.

Although most of the airports and FBOs have a security plan, not as many have a full security committee in place that meets regularly. When an airport does have a committee the makeup typically involves airport staff, the local FBO and other tenants, and local law enforcement agency. An interesting finding was that the FAA is more involved with these committees than the TSA. One airport with a security committee in place has as members of the committee representatives of the full Airport Advisory Committee. The Airport Advisory Committee is made up of tenants and is empowered to take responsibility for the safety and security of the airport. The airport mentioned that the make-up of this committee establishes ownership in any security procedures in both the security committee and the full advisory committee. In Colorado, the Division of Aeronautics partnered with Metro State College in Denver during their last State Aviation System Plan Update to establish a baseline as to what security measures are in place at general aviation airports. The university

surveyed the state’s general aviation airports and compared their current security measures with the TSA recommendations outlined in the security guidelines document to see whether airports met, or did not meet, the TSA guidance. The students then created a list of eligible security projects for which the airports could apply for funding from the state.

Perimeter and Access Control

Perimeter control and other physical barriers are effective means of keeping unauthorized individuals from the airport. Access control methods ensure that only authorized personnel can gain access to the facility. Most of the surveyed airports have perimeter fencing in place; however, many were already in place before 9/11 and were used primarily to restrict wildlife access to the airport. Airports continue to install new fencing and upgrade existing fencing as shown in Figure 6. Because fencing provides safety and security to the airport it is one of the few areas that are eligible for money through the FAA’s Airport Improvement Program. The Indiana study mentioned earlier also surveyed general aviation airports to determine if the airport had perimeter fencing and how much of the perimeter was fenced. The study found that the “proportion of airport perimeters fenced ranged from 7.5% to 100%, but most airport perimeters were >40% fenced” (*Reduction . . . 2006*, p. 85).

Controlling access to an airport is accomplished through different means at different airports. General aviation facilities are becoming more secure, whether it is at the perimeter fence line or buildings, on the perimeter, or even the locking of aircraft. In New Jersey, the state passed a law requiring aircraft parked for more than 24 h to use a combination of two locking devices to secure or disable the aircraft. Of those airports with some type of access control the majority use card readers and/or cipher locks, followed by key locks. Many of these airports use multiple methods to accommodate different needs at different areas of the facility.



FIGURE 6 New installation of perimeter fencing at a general aviation airport.

Controlling access to the airport is important; however, controlling access to facilities on the airport (i.e., hangars, terminal, offices, etc.) is equally important. The National Business Aviation Association developed a series of best practices for their members that provide good guidance for securing buildings on the airport. These best practices include:

- Ensure home facility perimeter security with effective fencing, lighting, security patrols (as appropriate), gates, and limited access areas.
- Ensure street-side gates and doors are closed and locked at all times.
- Require positive access control for all external gates and doors.
- Close and lock hangar doors when that area is unattended.
- Secure all key storage areas (food and liquor, parts and tools, etc.).
- Have an access control management system for keys and passes.
- Confirm the identity and authority of each passenger, vendor, and visitor before allowing access to facilities and aircraft.
- Escort all visitors on the ramp and in the hangar area.
- Use a government issued photo ID to verify the identity of any visitor or vendor.
- Post emergency numbers prominently around facility.
- Ensure easy access to phones or “panic buttons” in various facility locations (break room, hangar bay, etc.).
- Confirm security of destination facilities.
- Be aware of your surroundings and do not be complacent—challenge strangers.

Watch Programs

One of the most effective deterrents in security is awareness. One popular program is AOPA’s Airport Watch, which is

done in partnership with the TSA. The program encourages pilots to be the “eyes and ears for observing and reporting suspicious activity” and includes warning signs for airports, informational literature, and a training video to teach pilots and airport employees. More than 90% of the surveyed airports reported that they have an Airport Watch program on the facility. One airport manager, noting that they do participate and that he posts and shares information, stated that the real difference is that his tenant base is now aware of the potential threat and the impact it could have to general aviation. This awareness makes them keep a watchful eye for suspicious behavior around the airport. Another airport takes it one step further and rewards tenants and employees for playing a role in keeping the airport secure. The program offers cash rewards for crime-solving tips and has already proven successful as the airport rewarded four mechanics that caught a pilot trying to collect insurance money by burning his aircraft. Elements of the program are shown in Figure 7.

Smith Field in Fort Wayne, Indiana, entered into an agreement with the local ambulance service provider to stage an ambulance at the airport (see Figure 8). In its agreement with the city, the ambulance must meet a minimum required response time to certain locations within the city. As such, the service provider will stage ambulances throughout the city to meet these response time requirements. Realizing an opportunity to enhance both safety and security, the manager entered into an agreement for the ambulance to be stationed at the airport. The agreement provided dedicated parking to the ambulance and allowed the emergency medical technicians the use of the services in the common areas of the terminal. To avoid any perceived potential revenue diversion issues, the emergency management technicians are allowed access to the common areas of the terminal including the vending machines, coffee, restrooms, microwave, television, and furnishings. The airport noted that having an ambulance staged at the airport provides the advantage of having a 24-h presence on the airport grounds. The signed agreement between

Denver Centennial Airport Reward and Feedback Program

Tenant participation is recognized as a key element in airport security. In order to promote participation, the airport will provide recognition and feedback to tenants for their invaluable role in maintaining a secure airport through the following programs:

Reward Program

- For providing information that leads to an arrest, ACPAA will award from \$500 to \$2000 to the individual responsible.
- For providing information that leads to an ASCO/DCSO investigation, ACPAA will award a Visa Gift Card from \$50 up to \$2000 to the individual responsible, with a total cap of \$2000 for the year.

Feedback Program

- ACPAA will provide the FBOs with a report card quarterly that will list open and unattended aircraft found on their leasehold during the previous quarter

FIGURE 7 Denver Centennial Airport Reward and Feedback Program.



FIGURE 8 Smith Field in Fort Wayne, Indiana, entered into an agreement with the local ambulance provider to allow it to use the facility as a staging area.

the airport and the ambulance company outlines emergency procedures and contact information to respond to different potential incidents. A sample agreement and emergency procedures are included in Appendix D.

The agreement has already proven useful, as the ambulance company was able to contact the airport manager to report unlocked gates left open by tenants after hours. The airport manager was able to promptly resolve the issue. One caveat to the idea is that the ambulance provider may have to move its vehicle on short notice to meet its response time commitment as has recently happened at this airport. However, the airport reported that the agreement was a great idea, mutually beneficial, and that they would welcome the ambulance back at any time.

Risk Assessment

With more than 19,800 landing facilities nationwide, securing every general aviation airport for every possible threat is not practical. Tools to assess different risks and threats at airports have been developed by federal, state, and local agencies that can be used to focus an airport's security operations to reduce the impact of the potential threat. Federally, the TSA has developed vulnerability assessment tools as part of the *Security Guidelines for General Aviation Airports* document. On the state level, Colorado's Office of Preparedness and Security has developed the *Terrorism Protective Measures Resource Guide for General Aviation and Airports* (2005). Using these and other methods, 66% of the surveyed airports have undertaken a security risk assessment in the past five years. The Colorado document identifies threat categories and protective measures assigned to response objectives. These protective measures are further categorized by type and description. For example, to provide for the protection of infrastructure, which includes site utilities, material inputs, and products, the document instructs airports to know how to turn off power, gas, and water and have contingency plans in place for the loss of critical utility services. The guide also supplies an implementation matrix that escalates depending on the threat.

One county-owned general aviation airport used the TSA vulnerability assessment tool and, after completing the

assessment, hired a consultant to complete a more detailed vulnerability analysis. Additionally, the airport also requested that the local sheriff's department complete such an assessment; therefore, the airport had one completed by an external source (the consultant) and one by an internal source (the sheriff). Having two separate analyses allowed the airport to compare threats for the airport. Neither analysis found that international terrorism was the greatest threat, but determined that the most likely threat would be from environmental protestors because of the type of corporations located in the community surrounding the airport. The assessment believed that if the environmental protestors knew that a certain aircraft was based at the airport or coming to the airport, they (the protestors) might pose a security risk. Based on that analysis, the airport introduced as part of its security plan methods to address that specific threat. The airport director believed that having both an external and internal analysis allowed for a more complete picture to be drawn of the airport's vulnerabilities.

Another airport used the National Guard Bureau's Full Spectrum Integrated Vulnerability Assessment Tool to provide a different view toward risk assessment. The program is a National Guard Bureau Homeland Defense initiative in which each state and territory has a team of soldiers or airmen trained to conduct vulnerability assessments of critical infrastructure to prepare and plan an emergency mission response in the event of a terrorist attack or natural disaster. The airport stated that this was a useful process that provided important recognition of the potential threats that may be imposed on the airport's infrastructure. This tool has been used to assess other critical infrastructures beyond airports.

INDUSTRY SECURITY INITIATIVES

After the 9/11 terrorist attacks, it was not known what types of security initiatives would be required of the airport community. During this uncertain time the aviation industry took the lead in developing guidance that would prove useful until the system fully understood what changes might be in store. One of the first groups to address this dilemma was the AAAE, which initiated a series of meetings in late 2001 and 2002 that culminated in a series of recommendations that were sent to the TSA. Many organizations followed suit with their own set of recommendations, guidance documents, and best practices. For example, the Florida Airports Council developed a model security plan for its members, and as mentioned earlier, the National Business Aviation Association, which represents the nation's corporate aviation community, developed its own set of best practices. Equally effective was the development of AOPA's Airport Watch Program, which helped change the mindset of the general aviation community to be vigilant while on the airport. Each of these has proven useful to the general aviation community in identifying the potential security threat and offers recommendations of how to manage that threat.

CONCLUSIONS AND SUGGESTED RESEARCH

Airports, fixed base operators (FBOs), and other entities at general aviation airports approach safety and security seriously. The general aviation community has adapted to the safety needs of its users over the years and reduced accident/incident statistics are a direct result of this action. On the security side of the equation the industry has been quick to adopt the new reality of increased security at airports without the need for regulation. All of this is accomplished with a limited funding stream and a scattered set of resources and published best management practices. The findings of the survey do indicate that the general aviation community could benefit from a central repository where consolidated information could be easily accessed.

General aviation airports and their tenants are proactive in the development and implementation of safety plans that allow them to create operational practices tailored to the needs of their facility. Although the FAA guidance focuses on commercial service airports, the general aviation community has adapted that guidance to meet their own needs and has consistently shown that they can be effectively implemented with little cost.

The findings of the survey showed that the responding airports do believe emergency response to be a priority, although because most of the airports responding to the survey are larger general aviation airports may skew the numbers. Smaller facilities may have an emergency plan in place, but typically do not have the resources on the airport to respond and must rely on cooperative agreements with outside agencies.

Although it is not necessarily the case nationwide, fueling operations at the surveyed general aviation airports are primarily handled by FBOs. These operators have shown to be proactive in incorporating industry best practices into their operations. The survey findings indicate that they understand the importance of safety on the flight line and how carelessness can have effects on a customer long after the aircraft leaves the facility. The best practices being established by the FBO industry are an important step to increasing ramp safety.

The findings also show that general aviation airports recognize the severity of possible runway incursions. Not only are these airports instituting policies to reduce the occurrence of vehicular and pedestrian deviations, but they are proactive in working directly with the FAA and the pilot community in communicating potential runway incursion hazards on their airport.

Wildlife hazards at airports are increasing in frequency. Efforts need to continue to reduce the on-airport dangers of wildlife-related accidents or damage to aircraft. Many airports have plans in place, others do not. The use of fencing for prevention of wildlife entrance to the air operations also has the added benefit of restricting unauthorized access by humans.

The survey findings have shown that since the terrorist attacks of September 11, 2001, general aviation airports and their tenants have incorporated security plans into their daily operations and several of those airports were in the process of doing so when the survey was conducted. The TSA's security guidelines were a beneficial step in encouraging airports to develop security plans and implement procedures to increase general aviation security. Programs developed by other industry organizations have also proven useful and one of the most universally accepted has been the Aircraft Owner's and Pilots Association Airport Watch Program.

Security planning done cooperatively with a vulnerability assessment allows the airport to develop a security plan that meets the needs of the facility. Some airports need a wide variety of security measures to address the vulnerabilities at the airport, others need very few. What is clear in the survey findings is that general aviation is proactive in developing a safe and secure operating environment.

Key issues warranting further research include the following:

- What is the applicability of safety management systems to general aviation airports and how can a system be instituted at these facilities without disruption of operations or overwhelming an already limited staff? The concept of safety management is gaining acceptance in the aviation community and is being introduced to airports. Its' applicability and usefulness to the general aviation side of the community should not be overlooked.
- What are the wildlife issues at smaller airports and what are effective means of combating them?
- How much of an airport operating budget is spent to maintain safety and security? Understanding how much is spent could help to identify means for reducing the costs of implementing an airport's safety and security plans.

- What safety and security subjects are not being taught at the university level, but are an important part of operations?
- How can runway incursion dangers be communicated to transient pilots?
- The development of a toolbox or guidebook that can be used by airports to produce airport security plans, emergency plans, and standard operating procedures for operations specifically for smaller general aviation airports.
- Are there innovative ways to finance airport security?

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Wildlife Hazard Management: The Wisconsin Airport Owner's Perspective, Wisconsin Bureau of Aeronautics, Madison, 2003.

USEFUL WEBSITES

Aircraft Owners and Pilots Association: www.aopa.org

American Association of Airport Executives: www.aaae.org

FAA Airport Wildlife Mitigation: <http://wildlife.pr.erau.edu/index.html>

Florida Airports Council: www.floridaairports.org

National Air Transportation Association: www.nata.aero

Transport Canada—Sharing the Skies: An Aviation Industry Guide to the Management of Wildlife Hazards:

<http://www.tc.gc.ca/civilaviation/AerodromeAirNav/Standards/WildlifeControl/tp13549/menu.htm>

U.S. Department of Agriculture/APHIS Wildlife Damage:

http://www.aphis.usda.gov/wildlife_damage/

APPENDIX A

Survey Questionnaire

ACRP Synthesis S04-01

Safety Management and Security Practices for General Aviation Airports

The attached survey has been developed to assist with the completion of a Transportation Research Board Report on Safety Management and Security Practices for General Aviation Airports. The report will detail best practices currently in place at general aviation airports as they relate to safety and security. The report will not be used to make recommendations based on the results of the survey.

The attached survey is designed to gather a variety of information that will lead to the final synthesis report, which will include best practices and cost-effective safety and security solutions that are currently in use by the general aviation community. The survey contains questions about airport/operator safety and security. For the purposes of this survey effort safety relates to aviation and not workplace safety similar to what is covered by OSHA regulations.

The survey attempts to cover as many aspects of aviation safety and security as possible; however, given the diversity of airports and companies that receive the survey some sections may not be applicable. Additionally, you will find that some questions may look like they are asked twice. This is because of the nature of airport safety and security, but each question is intended for a specific purpose. Please attempt to fill out as much of the survey as possible.

An important part of the synthesis will be follow-on interviews with selected airports and individuals to identify relevant case studies and industry best practices. Based on the answers received you may be contacted for further information. Should you have any specific questions regarding the report or about the survey please contact Craig Williams at (630) 364-5228.

I. Resources for Safety and Security Information

In this section we would like to find out what resources you have used in the past to gather information regarding safety and security as it relates to general aviation. For the list below please provide whether or not you have used information from the listed resource. If you have used information from the selected resource please tell us how often (weekly, monthly, yearly). We also want to know how useful you found the information to be. Please circle the number that best represents your assessment of the site’s usefulness.

| Resource | Have You Used This Resource? Yes or No | How Often? Weekly/ Monthly/ Yearly | Is This Resource Helpful? Scale of 1 to 5 with 1 Being Very Helpful and 5 Being Not at All Helpful | | | | |
|---------------------------------------------------|-------------------------------------------|---------------------------------------------|-------------------------------------------------------------------------------------------------------------|---|---|---|---|
| | | | 1 | 2 | 3 | 4 | 5 |
| FAA Headquarters Website | _____ | _____ | 1 | 2 | 3 | 4 | 5 |
| FAA Regional Websites | _____ | _____ | 1 | 2 | 3 | 4 | 5 |
| TSA or DHS | _____ | _____ | 1 | 2 | 3 | 4 | 5 |
| ICAO | _____ | _____ | 1 | 2 | 3 | 4 | 5 |
| State DOT | _____ | _____ | 1 | 2 | 3 | 4 | 5 |
| Transportation Research Board | _____ | _____ | 1 | 2 | 3 | 4 | 5 |
| AOPA Airport Support Network | _____ | _____ | 1 | 2 | 3 | 4 | 5 |
| American Association of Airport Executives (AAAE) | _____ | _____ | 1 | 2 | 3 | 4 | 5 |
| National Business Aviation Association (NBAA) | _____ | _____ | 1 | 2 | 3 | 4 | 5 |
| National Air Transportation Association (NATA) | _____ | _____ | 1 | 2 | 3 | 4 | 5 |

We are also interested in resources that you use that may not be on the list. Please fill out the information below similar to how you filled out the table listed above.

| Resource | Have You Used This Resource? Yes or No | How Often? Frequently/ Sometimes / Rarely | Is This Resource Helpful? Scale of 1 to 5 with 1 Being Very Helpful and 5 Being Not at All Helpful | | | | |
|----------|-------------------------------------------|----------------------------------------------------|-------------------------------------------------------------------------------------------------------------|---|---|---|---|
| | | | 1 | 2 | 3 | 4 | 5 |
| _____ | _____ | _____ | | | | | |
| _____ | _____ | _____ | | | | | |

NOTE: If there are others, please list on back of sheet.

1. Have you attended an aviation industry training meeting for the purpose of gathering information regarding safety or security for general aviation since 2004?

Yes No

2. If yes, please list those conferences in the space provide below:

II. General Aviation Airport Safety Management

In this section we will ask questions specific to general aviation airport safety. For the purpose of this section the term “organization” is intended to mean the Airport, FBO, Tenant, and/or University (if applicable). Also, please remember that the term safety is intended to mean airport safety and not in relation to OSHA.

1. Does your organization have a safety program in place?

Yes No

2. When thinking about the elements of an airport safety plan, which of the following elements do you believe should be part of one?

- | | |
|---------------------------------------------|---------------------------------------------|
| <input type="checkbox"/> Pavement areas | <input type="checkbox"/> Safety areas |
| <input type="checkbox"/> Markings | <input type="checkbox"/> Signs |
| <input type="checkbox"/> Lighting | <input type="checkbox"/> Emergency response |
| <input type="checkbox"/> Fueling operations | <input type="checkbox"/> Navigational aids |

- Obstructions Ground vehicle operations
 Public protection Wildlife control
 Construction safety Winter operations/snow removal
 Self-inspection Fencing

3. Please list in the space provided below the position that best represents who is responsible for implementing and enforcing airport safety within your organization.
-
-

4. How is airport safety communicated to employees within the organization?

- Each employee is trained on non-OSHA related airport safety issues at the beginning of their employment
 Each employee is trained at the beginning of their employment and then on a recurring basis.

5. Please select the answer below that best represents the organization's response to a safety incident.

After an incident or accident within our organization:

- We review safety procedures with employees.
 Discuss the incident/accident and identify ways to prevent in the future.
 Nothing or unsure.

6. Does the organization have a hazard and incident reporting system in place?

- Yes No Unsure

7. Does the airport have an accident emergency response plan?

- Yes No Unsure

8. The airport last conducted a full-scale aircraft emergency response drill in:

- 2004–2006 2001–2004 Prior to 2001 Never/Unsure

9. Emergency services are provided at the airport by:

- On airport fire department
 Off airport fire department (less than 3 miles away)
 Off airport fire department (more than 3 miles away)

10. Does the airport have a written snow and ice control plan?

- Yes No Unsure

11. Does the airport have a committee or written procedures to review snow removal operations?

- Yes No Unsure

12. If “yes” to 11, please select from the list below people or groups that are represented on the committee:

- Airport staff Major tenants
 FBO Others (please specify): _____
 FAA reps _____

13. Who is responsible for fueling operations on the airport? (Check all that apply.)

- Airport staff FBO
 Self-fueling Other: _____

14. Does your organization have a safety training program for fuel safety?

- Yes No Unsure

15. Please explain briefly in the space below the elements of that program and who is trained.

16. Does the airport require training for individuals that operate vehicles on the airport operations area?

- Yes No Unsure

17. Does the airport attempt to raise awareness to the flying community of potential runway incursion dangers on the airport?

- Yes No Unsure

18. Are runway incursions reported?

Yes No Unsure

19. If “yes,” to whom? _____

20. Does the airport have a preventive maintenance plan in place?

Yes No Unsure

21. Does the airport have a wildlife hazard prevention plan?

Yes No Unsure

22. What are the elements of the wildlife hazard prevention plan mentioned in the question above?

23. What percentage of your organization’s operating budget is spent on safety?

<3% 3–5% 5–10% >10%

24. Please describe in the space below any unique safety management ideas or programs or equipment that have been implemented or purchased by the organization that you believe have made a positive impact on safety at your airport.

Thank you. The next section will focus on Airport Security Practices

III. General Aviation Airport Security Practices

The following questions pertain specifically to general aviation security. Please answer all questions applicable to your organization.

25. Does the organization have a security program in place?

Yes No Unsure

26. If “yes,” does the security response escalate with threat escalation?

- Yes No Unsure

27. If “yes,” who is the plan shared with?

- Fixed base operators TSA
 Local law enforcement Local fire department
 Other (please explain): _____

28. If “yes,” which of the following resources did you use to help to develop your program?
(Check all that apply.)

- None
 TSA
 State DOT
 Aircraft Owners and Pilots Association (AOPA)
 National Business Aviation Association (NBAA)
 National Air Transportation Association (NATA)
 American Association of Airport Executives (AAAE)
 Hired consultant
 Other (please specify):

29. Is the airport perimeter fenced?

- Yes No Unsure

30. If “yes,” how is access within this perimeter granted?

- Card readers
 Lock and key
 Staffed checkpoints
 Escorted access only
 No restrictions
 Other (please specify):

31. Does the airport have in place an AOPA Airport Watch type of program?

- Yes No Unsure of that program

32. Does your organization have an individual designated as the security coordinator?

- Yes No Unsure

33. Is there a security committee that meets regularly in place?

- Yes No Unsure

34. If yes, which of the list below are represented on the committee?

- Airport staff Local police
 FBO TSA representatives
 Other tenants FAA officials
 Other (please specify):

35. Has the airport undertaken a security risk assessment in the past five years?

- Yes No Unsure

36. What amount do you estimate your organization has spent in total on security the last five years?

- <\$100,000
 \$100,000 to \$500,000
 \$500,000 to \$1 million
 >\$1 million

37. What amount do you estimate your organization has spent in total on security the last two years?

- <\$100,000
 \$100,000 to \$500,000
 \$500,000 to \$1 million
 >\$1 million

38. Please describe in the space below any unique security ideas, programs, or equipment that have been implemented or purchased by the organization that you believe have made a positive impact on security at your airport.

IV. University Practices

The questions listed below are intended specifically for those colleges or universities that have aviation management or flight programs.

39. Within the past five years has the university made changes in the curriculum to incorporate changes to security regulations and operations?

- Yes No Unsure

40. Has the university developed classes tailored specifically to airport security?

- Yes No Unsure

41. Does the university have as part of its curriculum classes that are tailored specifically to the needs of general aviation airports?

- Yes No Unsure

42. Has the university worked with surrounding general aviation airports to develop security programs and awareness?

- Yes No Unsure

43. Does the university work with airports on internship programs promoting safety and security education?

- Yes No Unsure

The following questions are intended for those colleges or universities that provide flight training.

44. Do you have in place an apron safety program?

Yes No Unsure

45. Do you train your pilots on proper fueling procedures?

Yes No Unsure

46. Does the university use students to enforce security procedures on the airport?

Yes No Unsure

V. Respondent Information

Name: _____

Title: _____

Organization name: _____

Respondent telephone number: _____

Respondent e-mail address: _____

Thank you for taking the time to fill out this survey. Your responses are important and will be used in the creation of this report. Surveys can be returned by one of the following methods:

E-mail: craig.williams@rsandh.com

Fax: 630-505-1991

Or by mail:

Craig Williams, A.A.E.
Sr. Project Coordinator
Reynolds, Smith & Hills, Inc.
900 E. Diehl Rd. Ste. 100
Naperville, IL 60563

Should you have any questions about this survey or the forthcoming report to be published in mid-2007, please feel free to contact Craig Williams at (630) 364-5228.


APPENDIX B

Survey Respondents

| | | | |
|--------------------------------------|--------------------------|-----------------------------------------|------------------------------|
| Addison Municipal Airport | Addison, Texas | Lone Star Executive | Conroe, Texas |
| Allegheny County | Pittsburgh, Pennsylvania | Manassas Regional | Manassas, Virginia |
| Anoka County/Blaine/ Flying Cloud | Minneapolis, Minnesota | Merrill Field | Anchorage, Alaska |
| Arlington Municipal Airport | Arlington, Texas | Metro State College of Denver | Denver, Colorado |
| Banyan Air Service | Fort Lauderdale, Florida | Mid Valley Airport | Weslaco, Texas |
| Blue Ash | Cincinnati, Ohio | Middle Tennessee State University | Murfreesboro, Tennessee |
| Buchanan Field | Concord, California | Morristown Municipal | Morristown, New Jersey |
| Castle Airport Services | Akron, Ohio | New Braunfels Municipal | New Braunfels, Texas |
| Centennial Airport | Denver, Colorado | Ocala Regional | Ocala, Florida |
| Chesterfield County Airport | Richmond, Virginia | Orlando Executive | Orlando, Florida |
| Clover Field | Pearland, Texas | Owosso Municipal | Owosso, Michigan |
| College Park Airport | College Park, Maryland | Peachtree–DeKalb | Atlanta, Georgia |
| Cuyahoga County | Cleveland, Ohio | Renton Municipal | Renton, Washington |
| Daniel Webster College | Nashua, New Hampshire | Rocky Mountain Metropolitan | Denver, Colorado |
| Deer Valley | Phoenix, Arizona | Scottsdale Municipal | Scottsdale, Arizona |
| Detroit Willow Run | Detroit, Michigan | Signature Flight Support | Multiple locations |
| Dupage Airport Authority | West Chicago, Illinois | Skytrails Aviation | Los Angeles, California |
| Fort Lauderdale Executive | Fort Lauderdale, Florida | Smith Field | Fort Wayne, Indiana |
| Front Range Airport | Denver, Colorado | Southern Illinois University Airport | Carbondale, Illinois |
| Hanscom Field | Boston, Massachusetts | Spirit of St. Louis | St. Louis, Missouri |
| Huntingburg Airport | Huntingburg, Indiana | St. Louis Downtown | East St. Louis, Illinois |
| Indiana State University | Terre Haute, Indiana | Teterboro Airport | Teterboro, New Jersey |
| Jet Aviation | Multiple locations | Truckee Tahoe | Truckee, California |
| Kaiser Air | Oakland, California | University of North Dakota | Grand Forks, North Dakota |
| Landmark Aviation | Multiple locations | Winchester Regional | Winchester, Virginia |
| Leesburg Executive | Leesburg, Virginia | | |
| Lees Summit Municipal | Lees Summit, Missouri | | |

APPENDIX C

Sample Operational Best Practice from National Air Transportation Association

| | |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | |
| OPERATIONAL BEST PRACTICE - GROUND SMS Company Name Here | |
| Title: GA Aircraft Towing Effective Date: 00/00/2006 Rev: Original No. 8 | |
| Purpose: | The NATA Member Company has adopted this OBP for the safe and efficient handling of owned and customer aircraft and assets. |
| Policy Responsibility: | Chief Executive, General Manager, Line Supervisor, Maintenance Technician (as applicable). |
| Policy: | The NATA Member Company shall adhere to the following procedure when towing owned or customer aircraft or assets. |
| Procedure: | Prior to towing any General Aviation aircraft, the following minimum criteria must be met: <ul style="list-style-type: none"> ■ Determine the location that the aircraft will be towed is clear and of sufficient size to park the aircraft. ■ Determine the drawbar pull of the tow vehicle/pay mover and confirm that the vehicle is of sufficient weight and horsepower to successfully move the aircraft without incident. ■ Perform a vehicle inspection of the tow vehicle/pay mover and determine that steering and transmission is fully operational. ■ Determine that the vehicle's primary and emergency braking systems are fully operational. ■ Examine the vehicle's tow hitch to make sure that it is properly secured to the tow vehicle. The tow hitch must be bolted with appropriate grade 8 bolts. The hitch should also be examined to make sure it is fully operational. If the hitch utilizes a safety pin, the pin must be used during the tow operation. ■ Examine the tow bar to make sure that it is appropriate for the type of aircraft to be towed. |

APPENDIX D

Sample Agreement and Emergency Procedures with Ambulance Company

MEMORANDUM OF UNDERSTANDING

THIS MEMORANDUM OF UNDERSTANDING is made and entered into as of the _____ day of _____, 2006, by and between **The Fort Wayne–Allen County Airport Authority**, an Indiana municipal corporation as owner of Smith Field Airport (hereinafter the “Authority”), **Smith Field Air Service, LLC**, an Indiana limited liability company (hereinafter “SFAS”) as operator of Smith Field, and AMERICAN MEDICAL RESPONSE (hereinafter “AMR”), an.....

Recitals

AMR has requested the use of common areas of the terminal building at Smith Field Airport (hereinafter “Smith Field”), located at 426 West Ludwig Road, Fort Wayne, Indiana. Authority and SFAS desire to grant this license request.

NOW, THEREFORE, the parties agree as follows:

1. AMR shall have the license to use Smith Field only as a post for ambulances.
2. As a condition for the Authority to allow this use, AMR agrees to provide Authority and SFAS a Hold Harmless Indemnification, attached hereto as Exhibit A.
3. Authority and SFAS agree to allow AMR the use of the vending machines, coffee pots, restrooms, microwave, TV, refrigerator, and furnishings in the common areas of the terminal.
4. AMR agrees to keep the terminal in a neat and sanitary condition while its crews are at Smith Field.
5. AMR acknowledges that the terminal is non-smoking and agrees to only permit smoking in designated smoking areas.
6. AMR shall direct its staff that only local telephone calls of short duration can be made on the Smith Field telephones and that any long distance calls must be made with a calling card or collect to the other party. AMR agrees to reimburse Smith Field for any long distance calls billed to Smith Field during the hours of AMR’s use of Smith Field.
7. AMR shall be responsible to ensure the terminal is kept locked at all times during its use and properly secured when its crews leave Smith Field.
8. AMR agrees to not allow any Smith Field customers, visitors, etc. into the terminal after Smith Field business hours.

- 9. Authority agrees to provide AMR a designated ambulance parking space.
- 10. Either the Authority or AMR may terminate AMR’s use of Smith Field at any time with or without cause upon no less than ten (10) day’s prior written notice to the other party.
- 11. This Agreement shall be governed by the laws of the State of Indiana.

IN WITNESS WHEREOF, the parties hereto have executed this Agreement the day and year above written.

Fort Wayne–Allen County Airport Authority

By: _____
Torrance A. Richardson, A.A.E.
Its: Executive Director of Airports

Smith Field Air Service, LLC

By: _____
Stephen J. Hatch, M.D.

American Medical Response

By: _____
Its: _____

Sample Ambulance Agreement **Emergency Procedures**

Aircraft Accident During Normal Business Hours:

- Contact Airport Supervisor immediately. If Airport Supervisor is unavailable, leave a message and contact the FBO.
- Do not proceed to an on-airport crash site without permission from the Airport Supervisor or the FBO. The airport is still active and other aircraft could be landing and/or departing. Use all available lights while proceeding on the airport.
- Provide emergency medical attention, as needed.

Aircraft Accident After Normal Business Hours:

- In the event of an aircraft accident, either at or near the Airport, call 911 immediately. Proceed with caution to the crash site. The airport is still active and other aircraft could be landing and/or departing. Use all available lights while proceeding on the airport.
- Provide emergency medical attention, as needed.
- Contact Airport Supervisor at first opportunity. If Airport Supervisor is unavailable, leave a message and contact the Public Safety Department.

Security Breach During Normal Business Hours:

- Contact Airport Supervisor immediately. If Airport Supervisor is unavailable, leave a message and contact FBO.
- Keep violators in sight, but do not proceed on the airport.

Security Breach After Normal Business Hours:

- Contact Airport Supervisor immediately. If Airport Supervisor is unavailable, leave a message and contact the Public Safety Department.
- Approach violators with caution and ask their business on the airport. Do not confront or attempt to physically remove the violators. Try to obtain as much information as possible, to include: intentions, name, driver's license #, license plate #, year/type/model of vehicle, physical description, and any other useful information. Do not proceed on any runway to follow violators. The airport is active and there could be landing and/or departing aircraft.

Note: The Airport operates the FBO.

Exhibit A

Date: _____

HOLD HARMLESS INDEMNIFICATION

THIS HOLD HARMLESS INDEMNIFICATION is executed as of the date set forth above by **American Medical Response** (hereinafter “AMR”), a/an (insert legal identity of sponsor, e.g. Indiana nonprofit corporation, Indiana for profit partnership, etc) in favor of the **Fort Wayne–Allen County Airport Authority**, (hereinafter the “Authority”) and **Smith Field Air Service, LLC**, (hereinafter “SFAS”); and

WHEREAS, AMR has requested the Authority and SFAS to allow AMR the use of the common areas of the Smith Field Airport terminal as a post for ambulances and crews; and

WHEREAS, the Authority has agreed to allow AMR the use of the Smith Field terminal, in consideration of executing this Hold Harmless Indemnification in favor of the Authority and SFAS.

NOW, THEREFORE,

AMR does hereby indemnify the Authority and SFAS, their directors, officers, agents, employees, and each of them, jointly and severally, against any claims, actions, damages, liability, and expenses, in connection with any loss of life, personal injury, or damage to property arising from or out of any occurrence in connection with AMR’s use or occupancy of the Smith Field terminal or any part thereof, or occasioned wholly or in part by any act or omission of AMR, its agents contractors, employees, servants, invitees, licenses, or guests.

IN WITNESS WHEREOF, AMR has caused this Hold Harmless Indemnification to be executed as of the date set forth above.

American Medical Response

By: _____

Its: _____

APPENDIX E

Sample Peer Inspection Form



MEMORANDUM

TO: Airport Managers/Supervisors
FROM: Steve St. Onge
SUBJECT: Operations Manual Update
DATE: June 8, 2005

To All:

Place this new procedure Inter Airport Compliance Inspection (IACI) into the next available tab in your operations manual *section 22*. Annotate this in the table of contents and in the record of revisions sheet.

As discussed earlier this month, this new procedure is for airport managers only and will be performed once a quarter. The first round of inspections will be WST to UUU and SFZ to OQU and vice versa. Then we will mix it up with all of you going out randomly to each airport.

While you perform this inspection the airport manager will be at the airport but I want all of you to do the inspection independently. All findings will be sent to me and will be prioritized after discussing the inspection with you.

Prior to doing the inspection make sure you have all necessary tools and documentation. I have provided two documents for your reference, they are the table of contents and the record of revisions from my operations manual and each manual should look exactly as they appear on mine.

If you have any question prior to going out don't hesitate to call me.

| # | Priority | C. Date | Recommendations | Action by Airport Manager | Status & Signature |
|---|----------|------------|-----------------|---------------------------------|--------------------|
| 1 | | | | | |
| 2 | | | | | |
| 3 | | | | | |
| 4 | | | | | |
| 5 | | | | | |

Priority 1 = urgent corrective action needed, Priority 2 = corrective action within 30 days, Priority 3 = corrective action within 90 days

| Inspection Checklist | | | | |
|-----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-------|-----|
| Inspector: | | Home Location: | | |
| Airport ID: | | Date: | | |
| # | General Conditions | SAT | UNSAT | N/A |
| 1 | General condition of airport | | | |
| 2 | Cleanliness of fuel farm and trucks | | | |
| 3 | Cleanliness of satellite waste fuel area and log available | | | |
| 4 | Cleanliness of safety areas and ramp | | | |
| 5 | Lights and Nav aids working | | | |
| 6 | Cleanliness of restrooms, storage areas, kitchen | | | |
| Documentation | | | | |
| 7 | General condition of books—complete and up-to-date? | | | |
| 8 | Fuel farm records—complete and up-to-date? | | | |
| 9 | Fuel truck records—complete and up-to-date? | | | |
| 10 | Millipore test records—complete and up-to-date? | | | |
| 11 | Monthly checks—complete and up-to-date? | | | |
| 12 | Filter change records up-to-date? | | | |
| 13 | QC (OPS) manual available at all times? | | | |
| 14 | SPCC PLAN binder available? | | | |
| 15 | Work orders available for verification? | | | |
| 16 | Records of revisions current IAW operations managers manual? | | | |
| 17 | Daily self-inspection sheets available and current? | | | |
| 18 | Wildlife log/binder available and utilized? | | | |
| 19 | AST forms/binder available? | | | |
| 20 | Aircraft inventory logs up-to-date? | | | |
| 21 | Security procedure book available? | | | |
| 22 | Emergency response numbers available for fuel spills? | | | |
| Fuel Farm | | | | |
| 23 | Fuel leaks? | | | |
| 24 | Signs and placards in place on storage tanks...including product identification, FLAMMABLE, NO SMOKING, EMERGENCY, FUEL SHUTOFF. Clear and readable...no fading? | | | |
| 25 | Fire extinguishers available, charged, and sealed? | | | |
| 26 | Emergency shutdown system working and unobstructed? Confirm! | | | |
| 27 | Spill kits easily available and location identified? | | | |

| Airport ID: | | Date: | | |
|------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-------|-----|
| # | | SAT | UNSAT | N/A |
| Fuel Farm (Continued) | | | | |
| 28 | Ball valve closed for tank catch basin area. Visible signs of oil sheen? | | | |
| 29 | Filter differential pressure—recycle and check. <15 PSI—Confirm with logs | | | |
| 30 | Floating suction working if applicable? | | | |
| 31 | Filter change record label visible on filter housing? | | | |
| 32 | Turn on system and check for leaks | | | |
| 33 | Meter Calibration is current and seals attached? | | | |
| 34 | Deadman controls available and in good condition when pumping fuel? | | | |
| 35 | Bonding reel...visible signs of deterioration of cover, <10 ohms resistance (confirm with ohm meter) | | | |
| 36 | Perform paste test to check for standing water in tanks | | | |
| 37 | Perform shell water test in JET A fuel if applicable | | | |
| NOTES: | | | | |
| | | | | |
| Fuel Trucks | | | | |
| 38 | Cleanliness of trucks, INTERIOR? | | | |
| 39 | Cleanliness of trucks, EXTERIOR? | | | |
| 40 | Fuel leaks? | | | |
| 41 | Filter differential pressure constant (check books)? | | | |
| 42 | Fire extinguishers available, charged, and sealed? | | | |
| 43 | Signs and placards in place on storage tanks...including product identification, FLAMMABLE, NO SMOKING, EMERGENCY, FUEL SHUTOFF. Clear and readable...no fading? | | | |
| 44 | Bonding reel...visible signs of deterioration of cover, <10 ohms resistance (confirm with ohm meter)? | | | |
| 45 | Turn on system and check for leaks | | | |
| 46 | Meter calibration is current and seals attached? | | | |
| 47 | Fuel trucks chocked while parked? | | | |
| 48 | Fueling ladders available and in good condition (sturdy)? | | | |
| 49 | Fuel truck windshield and mirrors free of cracks? | | | |
| 50 | Deadman controls available when pumping fuel? | | | |
| 51 | Spill kits available in each truck? | | | |
| 52 | Tires in good condition? | | | |

Airfield

- 53 Segmented circle, paint, obstruction lights?
- 54 Wind cone condition—fading, torn, etc.?
- 55 Lighting—RWY, TWY operational. Obscured by bird droppings ? Angled 45 degrees or more?
- 56 Pavement condition, cracking spalling?
- 57 Vegetation growing on RWY, TWY, or ramp?
- 58 Gates closed and locked? Security signs and Emergency Entrance signs in place and readable at main gate?
- 59 FOD?
- 60 Height of grass between 7" and 14"?
- 61 Storm drains open and operational. Any foam or sheen near drain?
- 62 Articles not fixed by function; i.e., cones, stakes, barricades. If so, are they annotated on documentation?
- 63 Are any visible off-airport construction cranes documented?
- 64 Unattended vehicles on AOA?

NOTES:

Other Areas

- 65 Eye wash station available, kept current, and unobstructed?
- 66 MSDS sheets up-to-date and visible?
- 67 Other fuel tanks clean and neat (diesel—heating)?
- 68 Garage neat and orderly, trash removed if necessary?
- 69 Oil, paint, fuel, etc., stored properly (on spill pallets or fireproof cabinets)?
- 70 First aid kits available and organized
- 71 Field condition reports/NOTAMS posted in prominent location?
- 72 Emergency contact sign at front and rear entrance of Terminal Building?

Abbreviations used without definitions in TRB publications:

| | |
|------------|------------------------------------------------------------------------------------------------|
| AAAE | American Association of Airport Executives |
| AASHO | American Association of State Highway Officials |
| AASHTO | American Association of State Highway and Transportation Officials |
| ACI-NA | Airports Council International-North America |
| ACRP | Airport Cooperative Research Program |
| ADA | Americans with Disabilities Act |
| APTA | American Public Transportation Association |
| ASCE | American Society of Civil Engineers |
| ASME | American Society of Mechanical Engineers |
| ASTM | American Society for Testing and Materials |
| ATA | Air Transport Association |
| ATA | American Trucking Associations |
| CTAA | Community Transportation Association of America |
| CTBSSP | Commercial Truck and Bus Safety Synthesis Program |
| DHS | Department of Homeland Security |
| DOE | Department of Energy |
| EPA | Environmental Protection Agency |
| FAA | Federal Aviation Administration |
| FHWA | Federal Highway Administration |
| FMCSA | Federal Motor Carrier Safety Administration |
| FRA | Federal Railroad Administration |
| FTA | Federal Transit Administration |
| IEEE | Institute of Electrical and Electronics Engineers |
| ISTEA | Intermodal Surface Transportation Efficiency Act of 1991 |
| ITE | Institute of Transportation Engineers |
| NASA | National Aeronautics and Space Administration |
| NASAO | National Association of State Aviation Officials |
| NCFRP | National Cooperative Freight Research Program |
| NCHRP | National Cooperative Highway Research Program |
| NHTSA | National Highway Traffic Safety Administration |
| NTSB | National Transportation Safety Board |
| SAE | Society of Automotive Engineers |
| SAFETEA-LU | Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (2005) |
| TCRP | Transit Cooperative Research Program |
| TEA-21 | Transportation Equity Act for the 21st Century (1998) |
| TRB | Transportation Research Board |
| TSA | Transportation Security Administration |
| U.S.DOT | United States Department of Transportation |