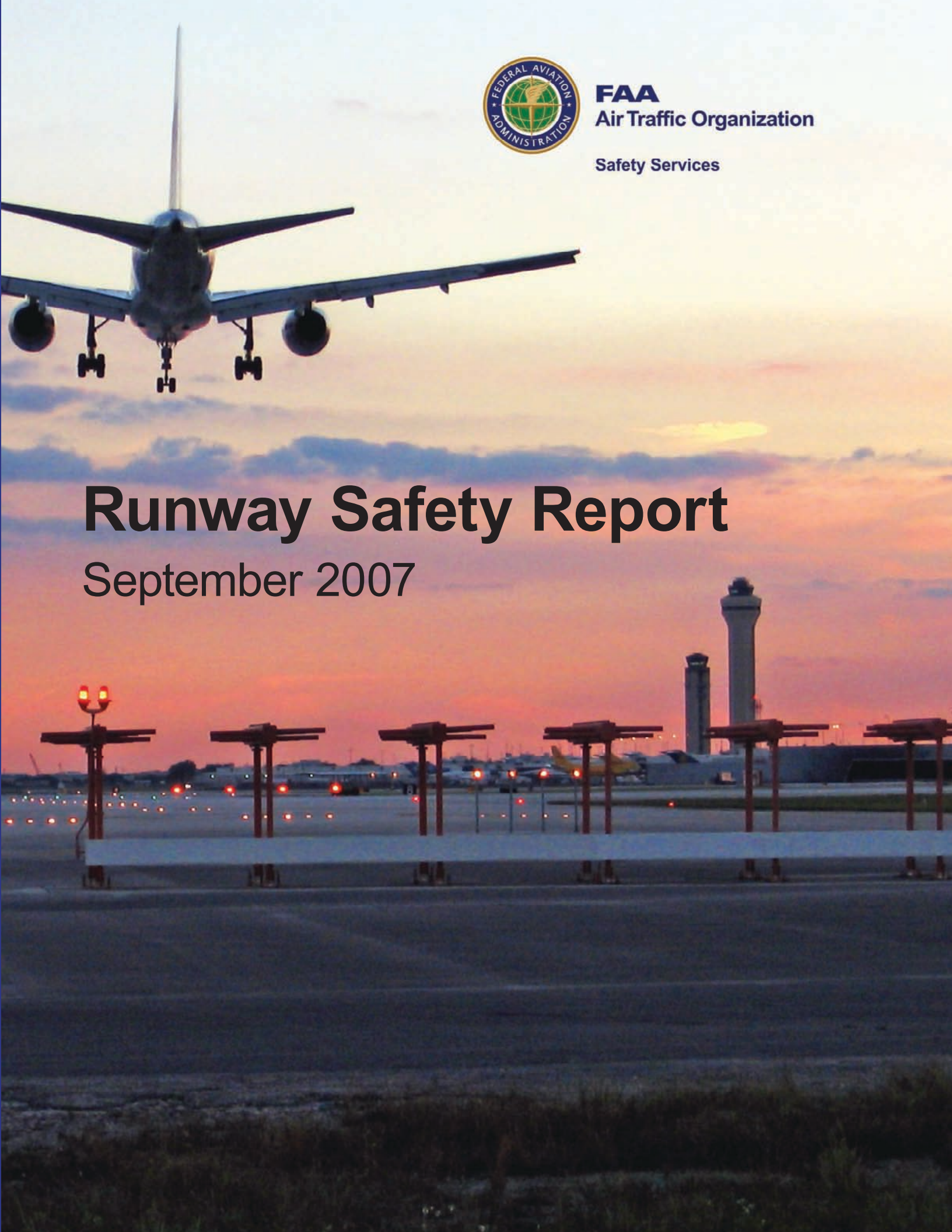


FAA
Air Traffic Organization

Safety Services

Runway Safety Report

September 2007

Message from the Administrator

The primary mission of the Federal Aviation Administration is safety. It's our bottom line. With the aviation community, we have developed the safest mode of transportation in the history of the world, and we are now enjoying the safest period in aviation history. Yet, we can never rest on our laurels because safety is the result of constant vigilance and a sharp focus on our bottom line.

Managing the safety risks in the National Airspace System requires a systematic approach that integrates safety into daily operations in control towers, airports and aircraft. Using this approach, we have reduced runway incursions to historically low rates over the past few years, primarily by increasing awareness and training and deploying new technologies that provide critical information directly to flight crews and air traffic controllers. Other new initiatives and technologies, as outlined in the 2007 Runway Safety Report, will provide a means to an even safer tomorrow.

With our partners, FAA will continue working to eliminate the threat of runway incursions, focusing our resources and energies where we have the best chance of achieving success.

To the many dedicated professionals in the FAA and the aviation community who have worked so tirelessly to address this safety challenge, I want to extend our deepest gratitude and appreciation for the outstanding work you have done to address this ever-changing and ever-present safety threat.

Robert A. Sturgell
Acting Administrator

FAA Runway Safety Report

Runway Incursion Trends and Initiatives at Towered Airports in the United States, FY 2003 through FY 2006

FAA Air Traffic Safety Services

Executive Summary

REDUCING THE POTENTIAL FOR RUNWAY INCURSIONS AND RUNWAY COLLISIONS is a top priority for the Federal Aviation Administration (FAA). Runway safety management is a dynamic process that involves analyzing runway incursions, understanding the factors that contribute to runway collision risks, and taking actions to reduce these risks. Runway incursion severity ratings (Category A through D) indicate the potential for a collision or the margin of safety associated with an event. The FAA aims to reduce the severity, number, and rate of runway incursions through the mitigation of errors that contribute to collision risks.

- Four Category A runway incursions resulted in collisions during the Fiscal Years (FYs) 2003 through 2006. Two of these collisions involved ground vehicles, one with a general aviation aircraft, and the other with a commercial aircraft. No fatalities resulted from any of the collisions *(see Page 7)*.

- During this four-year period, there were approximately 250 million operations at over 500 FAA towered airports in the United States—about 171,200 operations per day. Of these 250 million aircraft operations, there were 1,306 runway incursions—an average of one runway incursion per 191,500 operations during the four-year period. *(see Page 21)*.

- The FAA's performance target, as presented in the FAA Flight Plan 2007–2011, is to reduce the number of Category A and B runway incursions to a rate of 0.45 incursions per million operations by FY 2010 and maintain or improve that rate through FY 2011. For each of the FYs 2003 through 2006, the FAA met its performance targets to reduce the most severe (Category A and B) runway incursions. The Category A and B incursion rate for FY 2006 was 0.51 incursions per million operations, which is seven percent less than the FY 2006 performance target of 0.55 incursions per million operations. *(see Page 23)*.

- The FAA explored the distribution of runway incursion types with respect to severity. The number and rate of pilot deviations—the most common type of runway incursion—remained relatively consistent from FY 2003 through FY 2005, with an average rate of 2.7. The number and rate of pilot deviations then increased in FY 2006 to a rate of 3.1 per million operations. During the four-year period, 46 percent (55 of 120 incursions) of the Category A and B incursions were pilot deviations. The last FY during this timeframe brought the greatest fluctuation of Category A and B pilot deviations, from nine in FY 2005 to 18 in FY 2006 *(see Page 24)*.

- The number of operational errors/deviations fluctuated since FY 2003. FY 2004 and FY 2005 showed an increase in the number of operational errors/deviations, while FY 2006 brought a decrease of 15 percent. This type of incursion accounted for 38 percent of the National Airspace System (NAS) Category A and B runway incursions (46 of 120 incursions) *(see Page 26)*.

- There was a 15 percent reduction in the number of vehicle/pedestrian deviations during the four-year period. The number of Category A and B vehicle/pedestrian deviations decreased 67 percent from FY 2003 through FY 2006 *(see Page 27)*.

- The FAA explored runway incursion trends in terms of the type of aircraft operation involved: commercial or general aviation. Of the 1,306 runway incursions that occurred in the NAS over the four-year period, 45 percent (582 incursions) involved at least one commercial aviation aircraft. This is proportionate with the representation of commercial operations in the NAS (40 percent). During the four-year period, the majority (94 percent) of incursions involving at least one commercial aircraft were Category C and D events (545 of 582 commercial aviation runway incursions) *(see Page 28)*.

- The number and rate of general aviation runway incursions increased from FY 2003 through FY 2006. Eighty-two percent of Category A and B incursions (98 of 120 incursions) involved at least one general aviation aircraft. The number of Category A and B incursions involving one general aviation aircraft varied throughout the period, but continues to represent the largest segment of Category A and B incursions in the NAS *(see Page 33)*.

- Airports that primarily handle commercial operations and airports that primarily handle general aviation operations were explored to identify where changes to technology, procedures, and infrastructure may provide the most benefit to improve runway safety. The 35 FAA Operational Evolution Partnership (OEP-35) airports accounted for 32 percent of the total number of runway incursions in the NAS (421 of 1,306 incursions). The OEP-35 airports accounted for 25 percent (30 incursions) of the 120 Category A and B runway incursions nationwide from FY 2003 through FY 2006. The busiest general aviation airports (known as GA-35) accounted for 18 percent of the total number of runway incursions in the NAS (238 of 1,306 incursions). Twelve percent of these incursions were the more serious Category A and B events *(see Page 31 and 37)*.

Improving runway safety requires a collection of initiatives, each providing incremental benefit. Throughout the FAA, a variety of strategies have been employed to systematically reduce exposure to risk. There are multiple examples of advances through technology, infrastructure, tools, and training/safety promotion that demonstrate the concerted and wide-spread efforts to improve runway safety.

- Efforts continue to advance technology developed for facility-based controller notification through the use of surface-movement detection equipment. Emphasis on ground-based flight crew notification technology aims to track aircraft and vehicles entering and exiting the monitored zones on runways and alert pilots to potential runway incursions. Additionally, own-ship positioning equipment, the technology that provides pilots with real-time position information on the airfield, is being developed to replace paper charts and manuals and improve situational awareness *(see Page 47)*.

- To improve airport infrastructure features that help increase pilots' awareness of their location at the airport, the FAA works with industry safety experts, human factors specialists, pilot and controller communities, and airport operators to develop enhanced surface markings and runway lights. Advancements in runway infrastructure continue to provide additional visual indications to aircraft and increase the situational awareness of pilots and airfield drivers *(see Page 51)*.

- The FAA uses tools to track and understand operations, analyzing their impact on runway safety. Database tools that support the self-evaluation process at the facility, Service Area, and national levels have been implemented. A centralized repository of safety, aircraft, and airport-related information allows access to gathered information and provides a systems view helpful in analyzing runway incursions and other safety-related information *(see Page 56)*.

- Training and safety promotion development is an ongoing effort to improve runway safety. Expanded educational materials and courses aim to reduce operational errors in the terminal environment, address human factors in air traffic control towers, and reduce the risk of runway incursions *(see Page 57)*.

The FAA will continue its efforts to identify and respond to risks on the runway by analyzing runway incursion trends and the errors that lead to runway incursions. Due to the collective work of the FAA and the aviation community, several runway incursion trends and risk metrics have reached a very low frequency of occurrence and have begun to flatten. To continue this progress, the FAA's evolving safety management approach will include:

- A Safety Management System (SMS) that will be fully implemented by March 2010 within the Air Traffic Organization (ATO), providing a systematic and integrated method for managing safety *(see Page 11)*.

- Making the transition to the International Civil Aviation Organization (ICAO) standardized definition of a runway incursion and runway incursion severity, allowing the collection of comparable data and enabling the building of a database of global information that may be used to enhance runway safety management *(see Page 43)*.

The 2007 FAA Runway Safety Report presents an assessment of runway safety in the United States for FY 2003 through FY 2006. The report also highlights runway safety initiatives intended to reduce the severity, number, and rate of runway incursions. Historical runway incursion data and trends are available on the FAA Web site (**www.faa.gov**).

Introduction

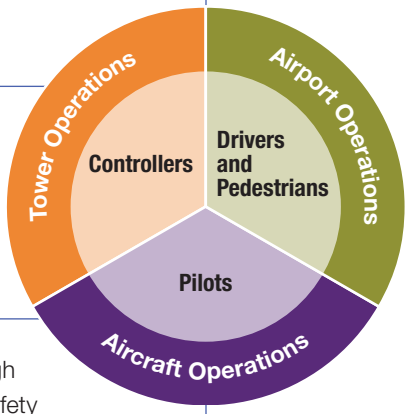
THE UNITED STATES NATIONAL AIRSPACE SYSTEM (NAS) has more than 500 FAA airports with air traffic control towers. These airports handle approximately 171,200 aircraft operations—takeoffs and landings—each day. This amounts to roughly 62.5 million airport operations per year. Of the approximately 250 million takeoffs and landings at these towered airports from FY 2003 through FY 2006, there were 1,306 reported runway incursions. This equals approximately 5.2 runway incursions for every one million operations. Four of the 1,306 incursions resulted in collisions on the runway. No fatalities resulted from these collisions. Of the more than 500 FAA towered airports, 289 airports reported at least one runway incursion during the four-year period.

Safe and efficient operations depend on clear communication and smooth coordination among approximately 15,000 air traffic controllers, approximately 600,000 pilots, and a wide variety of airport vehicle operators.[1] This shared responsibility is reinforced by a system of checks and balances including:

- Operational procedures, such as pilot readbacks of controller clearances
- Airport infrastructure, such as airfield signs, pavement markings, surface surveillance systems, and other safety technology
- Air traffic management, such as the coordination between ground and local control
- Training and awareness for the safe conduct of airport movement operations

Figure 1
A Systems Approach to Safety

Runway safety is a shared responsibility among pilots, controllers, and vehicle operators, all of whom constantly interact on the airport surface via radio communication, coordination, movement, and procedures. Technology, training, safety promotion, and situational awareness are key to reducing the severity and frequency of runway incursions.



This report details runway safety trends from the beginning of FY 2003 through the end of FY 2006 and expands on the analyses in previous FAA Runway Safety Reports. It examines runway safety from a quantitative and qualitative perspective in an effort to explore historical runway incursion trends as well as anticipate and mitigate emerging runway safety risks. This approach will help guide the further implementation of technologies and procedures to enhance runway safety and improve airport efficiency in response to NAS evolving requirements.

[1] *As many as one thousand vehicle operators could work at a single large airport at the same time.*

Runway Safety Management

REDUCING THE POTENTIAL FOR RUNWAY INCURSIONS AND RUNWAY COLLISIONS is a top priority for the FAA. The FAA's Air Traffic Organization (ATO), the air navigation service provider for the United States, strives to improve safety performance and mitigate the safety risks that may result in incidents such as runway incursions.

ATO Safety Services comprises many directorates that share information and work together to improve runway safety *(see Figure 2)*. Safety Services is responsible for implementing an effective SMS within the ATO, supporting the ATO in meeting target levels for safety, and mitigating operational safety risks. In particular, it establishes mechanisms to institutionalize a culture of safety within the ATO; tracks safety and service indicators; conducts trend analyses; and recommends risk mitigation activities to reduce runway incursions, improve operational performance, and reduce safety risk. Safety Services integrates the functions and information of risk reduction, investigations, evaluations, independent operational test and evaluation, Safety Risk Management (SRM), runway safety, and operational services to identify safety risks and help resolve them.

Figure 2
ATO Safety Services – Sharing Information to Improve Runway Safety

The Runway Safety Directorate exercises overall responsibility for the agency's Runway Safety Program. The Runway Safety Office provides leadership regarding runway safety while working with other FAA organizations and the aviation community to identify and implement activities and technologies designed to increase runway safety. In addition to developing, coordinating, and updating a comprehensive and cohesive runway safety strategy, the Office of Runway Safety measures whether established runway safety goals are met. The office provides training and educational materials for pilots, controllers, and

airfield drivers. It also serves as the official agency source for runway incursion statistics, determines which surface incidents are runway incursions, and develops metrics to assist in prioritizing runway safety strategies.

Within the Runway Safety Directorate, Regional Runway Safety Program Managers (RRSPMs) interface directly with aviation customers, both internal and external. Runway Safety Action Team (RSAT) meetings are conducted at airports that experience frequent or severe runway incursion incidents. These meetings are usually led by the RRSPM for that region, and the teams are composed of representatives from Airports (ARP), Flight Standards (AFS), Technical Operations, the ATO Safety Assurance group, and others. Airport operators, tenants, and users, as well as labor organizations, industry partners, FAA field facilities, and other interested organizations, are invited and encouraged to participate. The purpose of these meetings is to identify and address existing and potential runway safety problems and to identify corrective actions to further improve surface safety. Additionally, best practices and lessons learned are shared. After developing a plan that is jointly accepted, the RRSPMs assist in implementing solutions. Annually, the RRSPMs plan meetings at airports for the coming year, as well as other educational and training activities *(for example see Figure 3)*.

Figure 3
Runway Safety Field Activities in FY 2006

Activity	Total
Meetings at Non-Towered Airports	109
RSAT Meetings	109
Refresher Courses, Certified Flight Instructor, Designated Pilot Examiner, Inspection Authority	141
Education of Pilots, Mechanics, Drivers, etc.	322
Speaking Engagements	160
Other Activities	241
Total Major Activities	1082

Each entity within the ATO has a role in identifying and mitigating risks. The ATO is committed to transforming its culture of safety into one in which each employee views his or her role as a critical part of the safety of the NAS. To reinforce and improve the FAA's existing safety culture and structure of its safety system, the SMS is being implemented. The SMS is an integrated collection of processes, procedures, policies, and programs used to assess, define, and manage the safety risk in the provision of air traffic control and navigation services in the NAS. It institutionalizes a formalized and proactive approach to system safety through Safety Risk Management (SRM). SMS policy holds the ATO accountable to the same level of safety discipline required of the United States aviation industry and affords safety an equal footing with other business strategies, such as capacity, efficiency, and budget.

The SMS consists of four basic tenets:

- **Safety Policy** is the foundation and guidance of the SMS. It establishes the purpose and objectives of SMS and directs ATO personnel and management to apply relevant safety policies while promoting a positive safety culture. Safety Policy builds upon existing FAA orders, directives, processes and procedures, the SMS manual, and the SMS Order JO 1000.37.

- **SRM** is a formalized, proactive approach to system safety. SRM requires ATO personnel to document safety related changes to the NAS, evaluate and analyze risk, mitigate unacceptable risk, identify and track safety hazards until resolution, assess the effectiveness of risk mitigation strategies, and monitor performance of these changes throughout the entire scope of the operation or lifecycle of a system.

- **Safety Promotion** is the sharing of safety information that can be collected and distributed widely throughout the workforce. Safety promotion recognizes the importance of a positive safety culture that includes employee knowledge, involvement, and motivation to manage safety. A positive safety culture is one in which employees are encouraged to report safety deficiencies with the confidence that management will be fair and responsive.

- **Safety Assurance** is the tenet that provides processes to monitor compliance with SMS requirements and FAA orders, standards, policies, and directives. It includes measuring and verifying that procedures and processes in place, as well as changes to the NAS, are achieving their desired results. Through enhanced data collection and sharing, personnel can better analyze methods and opportunities to improve safety and reduce risks.

The SMS Order, which went into effect in March 2007, describes a formal approach to managing safety in the provision of air traffic control and navigation services. The order defines the requirements, roles, and responsibilities of the Service Units at all levels. It conforms to an ICAO agreement and aviation industry standards.

ATO safety processes and guidelines are communicated through the SMS Manual. In it, employees can find the tools, procedures, and processes for identifying, analyzing, assessing, mitigating, and tracking safety hazards. The first version of the SMS Manual was approved by the Air Traffic Safety Oversight Service (AOV) in FY 2005. Version 2 of the SMS Manual, which AOV reviewed, was developed in FY 2006. Safety Services is currently making modifications to the manual based on the AOV's comments and anticipates approval in FY 2008. As the safety processes for the ATO continue to evolve, the SMS Manual will be updated regularly with new and enhanced processes, procedures and lessons learned.

The SMS Implementation Plan provides a corporate perspective, including resource requirements, on implementation efforts throughout the ATO. Developed collectively with the Service Units, it augments legacy processes with new ones and closes the feedback loops between safety assurance, SRM, safety promotion, and policy changes. It serves as a roadmap for the Service Units to work collaboratively to fully implement the SMS by March, 2010. The Runway Safety Directorate is moving to formally incorporate SMS into the RSAT process by the end of 2008.

Beyond the Safety Services organization, other Lines of Business are involved in enhancing runway safety. AOV provides oversight, and other organizations designate personnel to act as representatives for runway safety and provide their discipline's viewpoint to runway safety issues and initiatives.

AOV is responsible for the independent safety oversight of the ATO's provision of air traffic services. Safety Services serves as the primary interface with AOV. AOV establishes, approves, or accepts the safety standards; establishes the requirements for the ATO SMS in accordance with ICAO; and approves the SMS Manual and any changes to it.

AOV monitors ATO compliance with safety standards and the SMS; approves actions prior to implementation; and reviews proposed responses to safety recommendations involving the ATO from the National Transportation Safety Board (NTSB), the Office of the Inspector General (OIG), and the General Accounting Office (GAO). This group has the authority to issue Letters of Correction, Warning Notices, and Safety Directives requiring the ATO to make a change, stop a procedure, or alter a practice if a safety concern warrants such an action.

ARP provides leadership in planning and developing a safe and efficient national airport system. Within ARP, the Office of Airport Safety and Standards uses its Airport Safety

Program to ensure that airports are operated in a safe and efficient manner. ARP has been charged with oversight of runway safety requirements dealing with wildlife hazards on and around airports; airfield signing, marking, and lighting; aircraft rescue and fire fighting; fueling; snow and ice control; and pedestrian and ground vehicle control.

The SMS for airport operators contributes to a continuing improvement in the level of aviation safety. The use of the SMS at airports can contribute to this improvement by increasing the likelihood that airport operators will detect and correct safety problems before those problems result in a runway incursion or an aircraft accident.

ARP is responsible for direct impacts on runway safety associated with construction at or near airports. Efforts such as airport lighting, obstruction evaluation, airport airspace analysis, and pavement design and construction contribute to the assessment and improvement of runway incursion rates at airports.

Flight Standards (AFS) works to promote safe air transportation by setting the standards for certification and oversight of airmen, air operators, air agencies, and designees. AFS also supports the safety of the flight of civil aircraft and air commerce by overseeing certification, inspection, surveillance, investigation, and enforcement; setting regulations and standards; and managing the system for registration of civil aircraft and all airmen records.

AFS plays an important role in coordinated and integrated safety efforts. It provides resources and expertise to implement runway safety initiatives and support program activities designed to achieve agency runway safety goals. AFS provides personnel at the national level and to the RRSPMs at the regional level. It also provides input on national planning and assistance for runway incursion assessments.

To increase the amount of safety data, some of which would not otherwise be available, AFS initiated the Runway Incursion Information Evaluation Program (RIIEP) to examine the root cause of surface incidents, including runway incursions. The program was first announced in March 2000, was renewed for the second time in July 2006, and is effective through July 2008. Currently, 34.6 percent of the individuals involved in pilot deviations and vehicle/pedestrian deviations participate.

Through enhancements to the program, the FAA intends to offer RIIEP as a model for international runway incursion risk reduction; use RIIEP data and analysis as a source for FAA recommendations and implementation of world-standard risk mitigation; and continue collaboration with FAA, industry, and academia safety information sharing initiatives.

A new safety program within the AFS is the FAA Safety Team (FAASTeam). The FAASTeam's mission is to improve the nation's aviation accident rate by communicating safety principles and practices through training, outreach, and education while establishing partnerships and encouraging the continual growth of a positive safety culture within the aviation community.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Background

ONE OF THE FAA's TOP PRIORITIES is to reduce the frequency of runway incursions and the risk of runway collisions. The agency aims to reduce the severity, number, and rate of runway incursions by implementing a combination of technology, infrastructure, procedures, and training intervention strategies to decrease human errors and increase the error tolerance of airport surface movement operations. The FAA implemented airport design concepts and surface movement procedures, such as perimeter taxiways, to decrease the number of runway crossings and thereby reduce the risk of runway incursions. Related efforts address the errors made by pilots, air traffic controllers, and airport-authorized vehicle operators and pedestrians.

Airports with air traffic control towers in the United States must report operational surface incidents, which may take place on the runway environment or on other airport movement areas. The FAA reviews all of these incidents and identifies a subset as runway incursions. A runway incursion, as defined by the FAA, is any occurrence in the airport runway environment involving an aircraft, vehicle, person, or object on the ground that creates a collision hazard or results in a loss of required separation with an aircraft taking off, intending to take off, landing, or intending to land.

The FAA assesses runway incursions to identify collision risks on the runway. Runway incursion severity represents the potential for a collision or the margin of safety. Severity ratings consider factors such as the actions required to avoid a collision and the distance between an aircraft and another aircraft or object. As part of the FAA's Flight Plan goal for International Leadership, the FAA has supported ICAO efforts to establish standard definitions of a runway incursion and runway incursion severity. Effective October 1, 2007, the FAA will identify runway incursions using the ICAO definition and classify them using ICAO severity categories *(see Initiatives and Future Directions section)*.

It is also important to understand the factors that may contribute to—or help prevent—runway incursions. Traffic volume is commonly viewed as the principal influence on the number of runway incursions. As the volume increases, the potential for errors also increases. Notionally, each additional aircraft operation represents at least one more potential interaction with another aircraft or object on the airport surface. However, traffic volume is not the only factor that contributes to runway incursions. Airport-specific factors (for example, complexity, infrastructure, procedures, operations and environment) influence the occurrence of runway incursions by providing opportunities for and defenses against human errors. These factors must be analyzed to develop more sophisticated safety metrics that complement current runway safety performance indicators.

Runway Safety Metrics

The FAA uses three primary metrics to assess runway safety trends: the frequency of runway incursions, the severity of runway incursions, and the types of runway incursions. These metrics are used in this report to examine national patterns and trends for specific aircraft operations and airports.

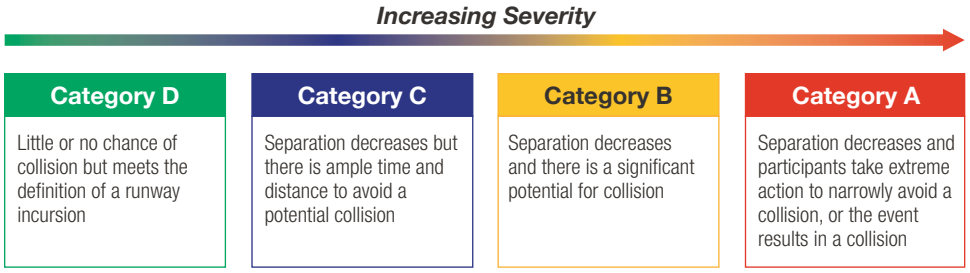
Frequency of Runway Incursions

This report describes both the number and rate of runway incursions to accurately present runway safety trends. The number of incursions provides a description of magnitude. The rate is how often events occur for a given number of operations. Because the rate accounts for the different number of operations at each airport, it serves as a basis for comparing runway safety trends among airports. For example, a rate might reflect a trend in the number of pilot deviations per million aircraft operations.

Severity of Runway Incursions

The FAA systematically categorizes each runway incursion in terms of the severity of its outcome into one of four categories. As shown in Figure 4, Category A is the most serious and Category D is the least serious. Appendix B1 contains a history of the FAA's runway incursion severity classification process. Appendix B2 lists the factors considered in the severity ratings.

Figure 4
Severity Categories of Runway Incursion Outcomes



The severity categories consider factors such as the speed and performance characteristics of the aircraft involved, the proximity of one aircraft to another aircraft or a vehicle, and the type and extent of any evasive action by those involved in the event.

Operational data pertaining to runway incursions are evaluated by the Runway Incursion Assessment Team. This team is composed of subject matter experts from the following areas: air traffic, flight deck operations, and airports, although the composition of the team changes over time. This has the potential to affect the severity ratings of runway incursions.

To address the potential for variability in how the outcomes of runway incursions are categorized, the Runway Incursion Severity Classification (RISC) model was developed. This tool provides the FAA with a more consistent mechanism for categorization. The RISC

model is an automated system for rating the severity of the outcome of runway incursions based on the same decision processes used by FAA subject matter experts in the group assessment process. The use of the RISC model will reduce the subjectivity associated with the categorization process, producing more consistent severity ratings from year to year. The RISC model assigns a severity rating to an incident based on the details from the preliminary report. In this way, categorization criteria are applied in the same manner to every incident. Validation of the RISC model revealed very similar severity results to those assigned by the team of subject matter experts. ICAO has offered the RISC model to its member states as a tool for standardizing the severity ratings of runway incursions.

Types of Runway Incursions

The FAA categorizes runway incursions into three error types: pilot deviations, operational errors/deviations, or vehicle/pedestrian deviations. Identification of a runway incursion as a pilot deviation, an operational error/deviation, or a vehicle/pedestrian deviation is not an indication of the cause of the runway incursion; it is a classification of an error type. These error types typically refer to the last event in a chain of pilot, air traffic controller, and/or vehicle operator actions that led to the runway incursion.

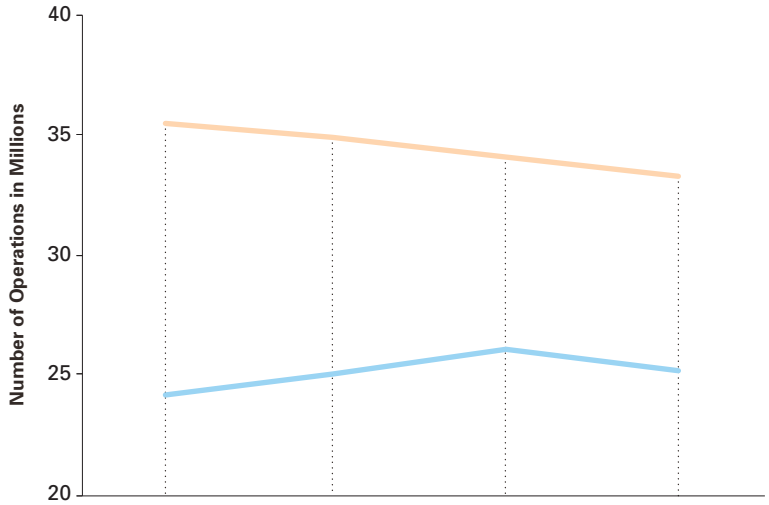
Figure 5
Types of Runway Incursions

Operational Errors/ Deviations	An operational error (OE) is an action of an air traffic controller (ATC) that results in: ■ Less than the required minimum separation between two or more aircraft, or between an aircraft and obstacles (e.g., vehicles, equipment, personnel on runways). ■ An aircraft landing or departing on a runway closed to aircraft. An operational deviation (OD) is an occurrence attributable to an element of the air traffic system in which applicable separation minima were maintained, but an aircraft, vehicle, equipment, or personnel encroached upon a landing area that was delegated to another position of operation without prior coordination and approval.
Pilot Deviations	A pilot deviation (PD) is an action of a pilot that violates any Federal Aviation Regulation. For example, a pilot fails to obey air traffic control instructions to not cross an active runway when following the authorized route to an airport gate.
Vehicle/Pedestrian Deviations	A vehicle or pedestrian deviation (V/PD) includes pedestrians, vehicles, or other objects interfering with aircraft operations by entering or moving on the movement area without authorization from air traffic control. NOTE: This runway incursion type includes mechanics taxiing aircraft for maintenance or gate re-positioning.

National Airspace System Performance

CHANGES TO COMMERCIAL AVIATION AND GENERAL AVIATION MARKETS continue to pose operational and financial challenges to airports throughout the NAS. Though traffic volumes have remained relatively stable *(see Figure 6)*, the FAA predicts that passenger demand for air transportation will increase an average of 3.4 percent each year through 2017, totaling one billion passengers annually. General aviation operations are forecasted to grow, with the piston aircraft fleet increasing at an average annual rate of 1.4 percent, and business jets growing at an average rate of four percent per year. With a variety of initiatives underway, the challenge remains managing safety while responding to demands for greater capacity.

Figure 6
Commercial Aviation and General Aviation Operations (FY 2003 through FY 2006)



	FY 2003	FY 2004	FY 2005	FY 2006
General Aviation	35,524,020	34,967,596	34,160,953	33,350,705
Commercial Aviation	24,249,848	25,177,930	26,084,009	25,203,948

Figure 7 represents the distribution of aircraft operations in the NAS and each type's involvement in runway incursions. General aviation flights accounted for 55 percent of the NAS activity during this study period, yet were involved in 72 percent of incursions. Commercial aviation accounted for 40 percent of NAS activity during this period and military aviation accounted for the remaining five percent of aircraft operations. The involvement of military and commercial operations in runway incursions was in proportion to their activity in the NAS.

Figure 7
Comparison of Aircraft Operations in the NAS and their Percentage of Involvement in Runway Incursions[2]

	FY 2003 through FY 2006		
	Percentage of NAS Aircraft Operations	Percentage of NAS Runway Incursions	Percentage of Severe Runway Incursions (Category A and B)
Commercial Aviation	40%	45%	31%
General Aviation	55%	72%	82%
Military Aviation	5%	3%	2%

Of the more than 500 FAA towered airports, 215 airports (43 percent) had zero runway incursions, 215 airports (43 percent) had one to five incursions, and 47 airports (nine percent) had six to 10 incursions from FY 2003 through FY 2006. Twenty-seven airports (five percent) had more than 10 runway incursions during the four-year period *(see Figure 8)* representing the greatest potential for improvement.

Figure 8
Runway Incursions at FAA Towered Airports (FY 2003 through FY 2006)

Number of Runway Incursions	Number of FAA Towered Airports	Percentage of FAA Towered Airports
0	215	43%
1 - 5	215	43%
6—10	47	9%
11—20	20	4%
21—30	5	1%
Over 30	2	<1%

Total Number of FAA Towered Airports: 504[3]

[2] *To emphasize the risk of an incursion rather than accountability for a runway incursion, the statistics in this report refer to aircraft as being "involved" in runway incursions and do not distinguish between the aircraft responsible for the deviation and the aircraft being incurred upon. Therefore, an incursion that involved a commercial aircraft and a general aviation aircraft may be considered as both a commercial aviation runway incursion and as a general aviation runway incursion. This explains why the Percentage of NAS Runway Incursions column in Figure 7 exceeds 100 percent.*

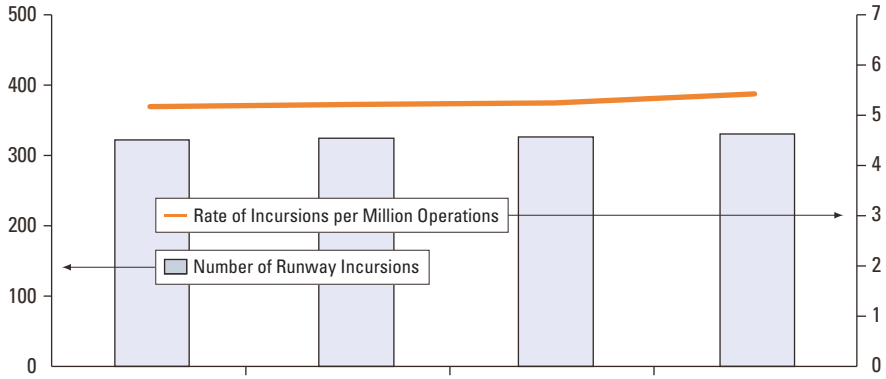
[3] *All facilitates operating between FY 2003 and FY 2006 may not be present due to activation/deactivation and/or temporary status of towers. Data as of 3/22/2007.*

Frequency of Runway Incursions

During FY 2003 through FY 2006, there were approximately 250 million operations at over 500 FAA towered airports in the United States—about 171,200 operations per day. Of these 250 million aircraft operations, there were 1,306 runway incursions—an average of one runway incursion per 191,500 operations during the four-year period. From FY 2003 to FY 2005, runway incursions averaged 5.2 per million operations. Due to three more incursions compared to FY 2005, FY 2006 had a rate of 5.4 incursions per million operations—a four percent increase *(see Figure 9)*.

Figure 9

Number and Rate of Runway Incursions (FY 2003 through FY 2006)



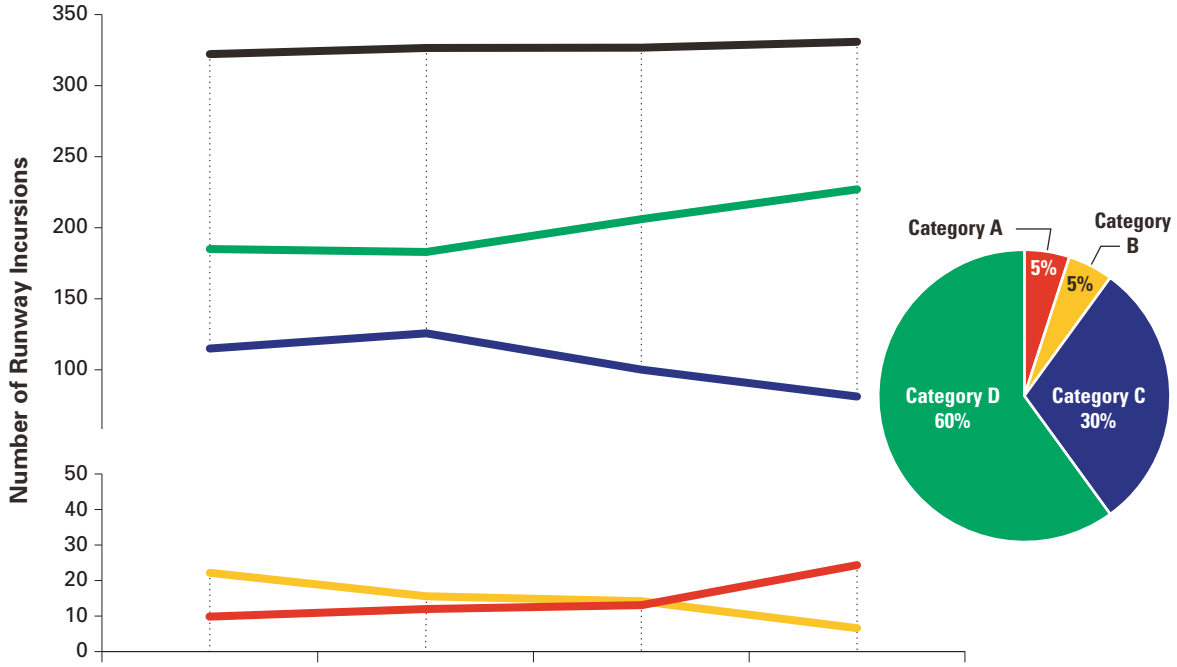
	FY 2003	FY 2004	FY 2005	FY 2006	Total
Number of Runway Incursions	323	326	327	330	**1,306**
Rate of Runway Incursions per Million Operations	5.1	5.2	5.2	5.4	**5.2**
Total Number of Operations	62,783,048	63,124,797	63,108,846	61,334,693	**250,351,384**

Note: Appendix D lists the number and rate of runway incursions for all U.S. towered airports that reported at least one runway incursion or surface incident for the four-year period.

Severity of Runway Incursions

Over the four-year period, Category A and D runway incursions increased while Category B and C runway incursions decreased *(see Figure 10)*. The majority (91 percent) of runway incursions—1,186 of the 1,306 runway incursions—were Category C and D events that involved little or no risk of a collision. From FY 2004 through FY 2006, the composition of Category C and D runway incursions showed a positive shift from more severe Category C incursions to less severe Category D incursions.

Figure 10
Runway Incursion Severity Distribution (FY 2003 through FY 2006)

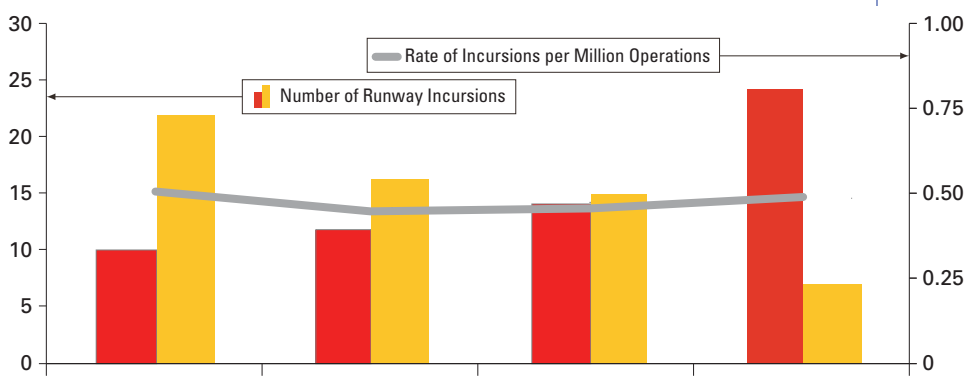


	FY 2003		FY 2004		FY 2005		FY 2006		Total	
	Number	Rate per Million Ops	Number	Rate per Million Ops	Number	Rate per Million Ops	Number	Rate per Million Ops	Number	Rate per Million Ops
Category D	181	2.88	178	2.82	203	3.22	224	3.65	786	3.14
Category C	110	1.75	120	1.90	95	1.51	75	1.22	400	1.60
Category B	22	0.35	16	0.25	15	0.24	7	0.11	60	0.24
Category A	10	0.16	12	0.19	14	0.22	24	0.39	60	0.24
Total	323	5.1	326	5.2	327	5.2	330	5.4	1,306	5.2

From FY 2003 through FY 2006, 120 of the 1,306 runway incursions were Category A and B. Four Category A runway incursions resulted in collisions during the four-year period, three in FY 2003 and one in FY 2005. Two of these events were between two general aviation aircraft, one was between a general aviation aircraft and a maintenance tug, and one was between a commercial cargo aircraft and construction cones on a closed runway at night. No fatalities resulted from any of the collisions. Appendix B.3 provides the specific airports where the collisions took place, the dates of the collisions, and a brief description of these events.

From FY 2003 through FY 2005, there was a slightl declining trend in the total number and rate of Category A and B runway incursions *(see Figure 11)*. However, FY 2006 saw a slight increase, and the composition of runway incursions has changed over the four-year period. Category B incursions decreased substantially from 22 in FY 2003 to seven in FY 2006.

Figure 11
Total Number and Rate of Category A and B Runway Incursions (FY 2003 through FY 2006)



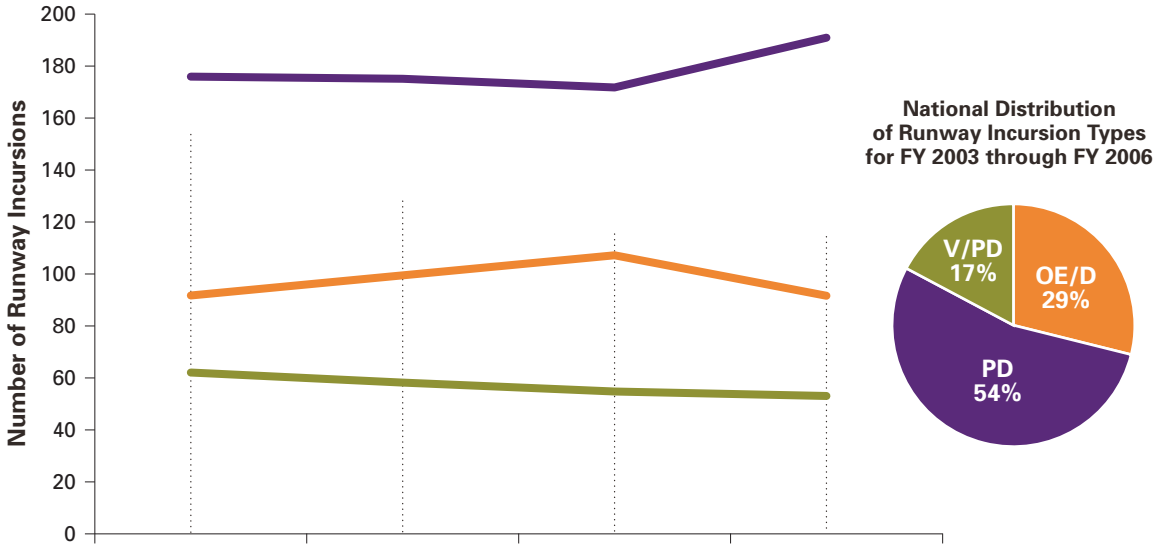
	FY 2003		FY 2004		FY 2005		FY 2006		Total	
	Number	Rate per Million Ops	Number	Rate per Million Ops	Number	Rate per Million Ops	Number	Rate per Million Ops	Number	Rate per Million Ops
Category B	22	0.35	16	0.25	15	0.24	7	0.11	60	0.24
Category A	10	0.16	12	0.19	14	0.22	24	0.39	60	0.24
Total	32	0.51	28	0.44	29	0.46	31	0.51	120	0.48

The FAA Flight Plan 2007—2011 performance target is to limit the most serious (Category A and B) runway incursions to a rate of no more than 0.45 per million operations by FY 2010 and maintain or improve that rate through FY 2011. For each of the FYs 2003 through 2006, the FAA met its performance targets to reduce the most severe (Category A and B) runway incursions. The Category A and B incursion rate for FY 2006 was 0.51 incursions per million operations, which is seven percent less than the FY 2006 performance target of 0.55 incursions per million operations.

Types of Runway Incursions

The following section highlights the four-year trends for the three types of runway incursions: pilot deviations, operational errors/deviations, and vehicle/pedestrian deviations. In addition, the FAA explored the distribution of runway incursion types with respect to severity.

Figure 12
Number and Rate of Incursions for Each Runway Incursion Type (FY 2003 through FY 2006)

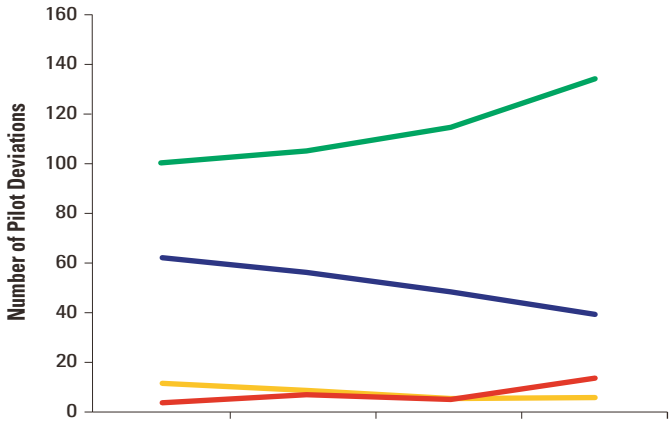


	FY 2003		FY 2004		FY 2005		FY 2006		Total	
	Number	Rate per Million Ops	Number	Rate per Million Ops	Number	Rate per Million Ops	Number	Rate per Million Ops	Number	Rate per Million Ops
Pilot Deviations	174	2.8	173	2.7	169	2.7	190	3.1	706	2.8
Operational Errors/ Deviations	89	1.4	97	1.5	105	1.7	89	1.5	380	1.5
Vehicle/Pedestrian Deviations	60	1.0	56	0.9	53	0.8	51	0.8	220	0.9
									1,306	**5.2**

Pilot Deviations

Pilot deviations accounted for 54 percent of the runway incursions (706 of 1,306 incursions) during the four-year period *(see Figure 12)*. During that time, the FAA focused efforts on reducing pilot deviations through awareness, education, procedures, and surface technology initiatives. From FY 2003 through FY 2005, the rate of pilot deviations remained relatively consistent. It then increased in FY 2006 to a rate of 3.1 incursions per million operations.

Figure 13
Number and Severity of Pilot Deviations (FY 2003 through FY 2006)



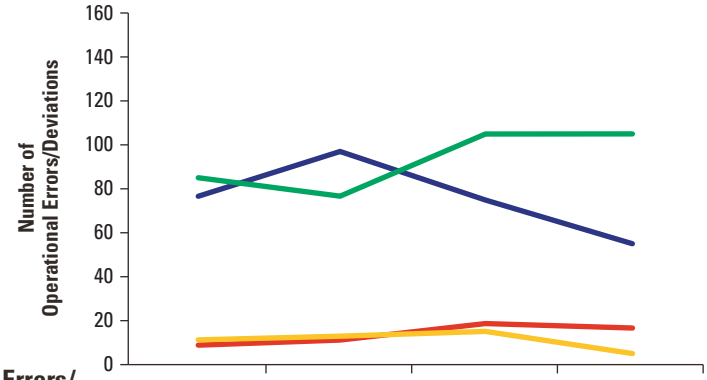
Pilot Deviations	FY 2003	FY 2004	FY 2005	FY 2006	Total PD
Category D	99	104	113	133	**449**
Category C	61	55	47	39	**202**
Category B	11	8	5	5	**29**
Category A	3	6	4	13	**26**
Total	**174**	**173**	**169**	**190**	**706**

From FY 2003 through FY 2006, 55 percent of the Category C and D incursions (651 of 1,186 incursions) were pilot deviations. From FY 2003 through FY 2005, the number of Category C and D incursions remained consistent, but then increased by eight percent in FY 2006. The composition of Category C and D pilot deviations showed a positive shift from Category C incursions to the less severe Category D incursions.

From FY 2003 through FY 2006, 46 percent of the Category A and B incursions (55 of 120 incursions) were pilot deviations. Over the four-year period, the number of Category A and B pilot deviations decreased to a low of nine in FY 2005 then increased to a high of 18 in FY 2006 *(see Figure 13)*.

Operational Errors/Deviations

Figure 14
Number and Severity of Operational Errors/Deviations (FY 2003 through FY 2006)



Operational Errors/ Deviations	FY 2003	FY 2004	FY 2005	FY 2006	Total OE/D
Category D	42	38	52	52	**184**
Category C	38	48	37	27	**150**
Category B	5	6	7	2	**20**
Category A	4	5	9	8	**26**
Total	**89**	**97**	**105**	**89**	**380**

From FY 2003 through FY 2006, operational errors/deviations accounted for 29 percent of all runway incursions (380 of 1,306 incursions). FY 2004 and FY 2005 showed an increase in the number of operational errors/deviations, while FY 2006 brought a decrease of 15 percent.

From FY 2003 through FY 2006, 28 percent of Category C and D incursions (334 of 1,186 incursions) were operational errors/deviations. Combined, Category C and D operational errors/deviations increased in FY 2004 and FY 2005, then decreased in FY 2006. However, the composition of Category C and D incursions has shown a positive shift, with less severe Category D incursions making up a larger proportion, while Category C incursions decreased.

From FY 2003 through FY 2006, 38 percent of the overall NAS Category A and B runway incursions (46 of 120 incursions) were operational errors/deviations. Since FY 2003, the number of Category A and B operational errors/deviations increased through FY 2005, but then decreased 38 percent in FY 2006 *(see Figure 14)*.

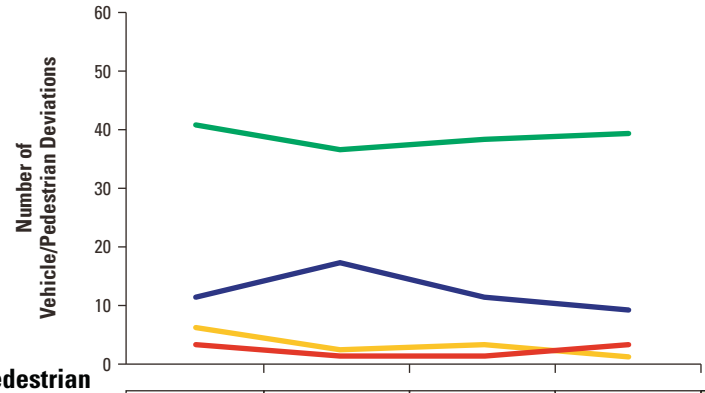
Vehicle/Pedestrian Deviations

Vehicle/pedestrian deviations accounted for 17 percent of all runway incursions (220 of 1,306 incursions) during the four-year period *(see Figure 15)*. Over this period, the number of vehicle/pedestrian deviations decreased 15 percent from 60 in FY 2003 to 51 in FY 2006.

From FY 2003 through FY 2006, 17 percent of Category C and D incursions (201 of 1,186 incursions) were vehicle/pedestrian deviations. Over this period the total number of Category C and D vehicle/pedestrian deviations decreased by six percent.

Of the 120 Category A and B runway incursions in the NAS during this period, 16 percent were vehicle/pedestrian deviations (19 of 120 incursions). From FY 2003 through FY 2006, there was a 67 percent decrease.

Figure 15
Number and Severity of Vehicle/Pedestrian Deviations (FY 2003 through FY 2006)



Vechicle/Pedestrian Deviations	FY 2003	FY 2004	FY 2005	FY 2006	Total V/PD
Category D	40	36	38	39	**153**
Category C	11	17	11	9	**48**
Category B	6	2	3	0	**11**
Category A	3	1	1	3	**8**
Total	**60**	**56**	**53**	**51**	**220**

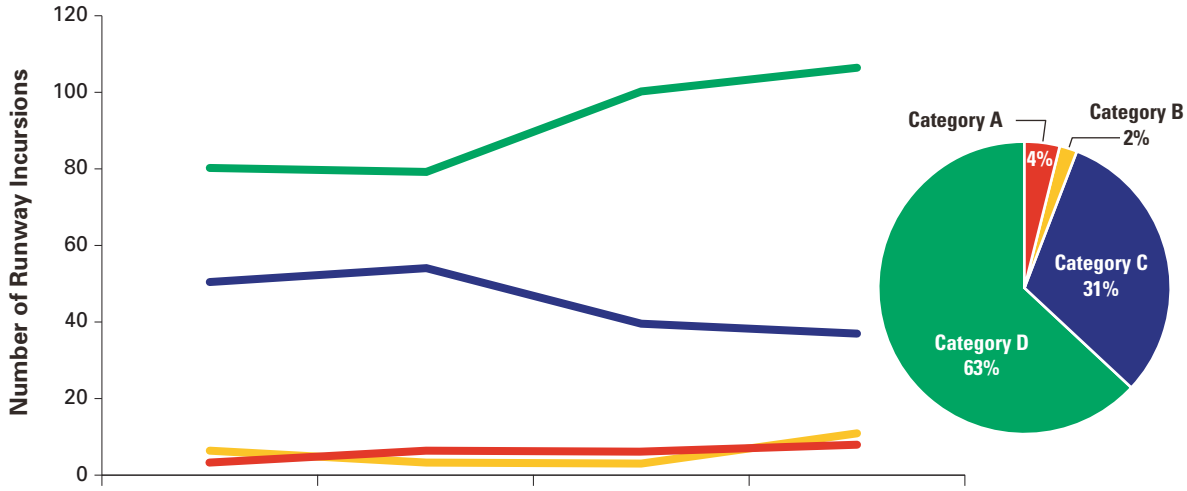
Commercial Aircraft Involved In Runway Incursions

Commercial Aviation Operations, as defined in this report, comprise aircraft that are typically operated by airlines, charter services, and air cargo for the transportation of ticketed passengers and cargo. From FY 2003 through FY 2006, commercial aviation operations accounted for approximately 40 percent of all aircraft operations in the NAS.

From FY 2003 through FY 2006, 45 percent of the 1,306 runway incursions (582 incursions) involved at least one commercial aviation aircraft, which is proportionate with the representation of commercial operations in the NAS (40 percent).

Severity of Commercial Aviation Runway Incursions

Figure 16
Severity of Runway Incursions Involving at Least One Commercial Aviation Aircraft (FY 2003 through FY 2006)



	FY 2003	FY 2004	FY 2005	FY 2006	Total
Category D	80	79	100	106	365
Category C	50	54	39	37	180
Category B	6	3	3	2	14
Category A	3	6	6	8	23
Total	139	142	148	153	582

During the four-year period, the majority of incursions involving at least one commercial aviation aircraft were Category C and D events—545 of the 582 commercial aviation runway incursions *(see Figure 16)*. Similar to the overall NAS trends, the number of Category C commercial aviation runway incursions decreased from FY 2004 to FY 2006 and the number of Category D incursions increased during the same period.

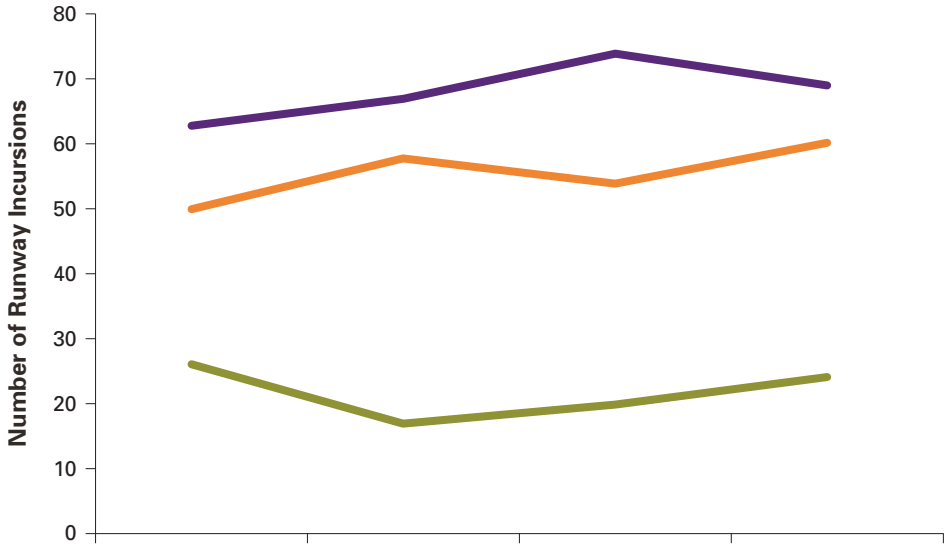
From FY 2003 through FY 2006, Category A and B runway incursions represented six percent (37 of 582 incursions) of all runway incursions involving at least one commercial aircraft. While the number of these incursions remained stable from FY 2004 through FY

2005, Category B incursions decreased by one incursion during FY 2006 (three in FY 2005 compared to two in FY 2006). However, there were two more Category A incursions in FY 2006 than in FY 2005.

Types of Commercial Aviation Runway Incursions

To tailor safety management strategies to address the specific risks involving commercial aircraft operations, the FAA analyzed commercial runway incursions by error type: pilot deviations, operational errors/deviations, and vehicle/pedestrian deviations.

Figure 17
Number of Runway Incursions Involving at Least One Commercial Aviation Aircraft by Incursion Type (FY 2003 through FY 2006)



	FY 2003	FY 2004	FY 2005	FY 2006	Total
Pilot Deviations	63	67	74	69	273
Operational Errors/ Deviations	50	58	54	60	222
Vehicle/Pedestrian Deviations	26	17	20	24	87
					582

Pilot Deviations

Nationally, there were 706 pilot deviations for the four-year period. Of these pilot deviations, 39 percent (273 incursions) involved at least one commercial aircraft. From FY 2003 through FY 2005 the number of commercial aviation runway incursions classified as pilot deviations increased *(see Figure 17)*. However, in FY 2006 the number of these incursions decreased to 69 pilot deviations compared to 74 pilot deviations in FY 2005.

From FY 2003 through FY 2006, the majority of commercial aviation pilot deviations were Category C and D (259 of 273 incursions). Each of the four years during this time period saw a decrease in Category C commercial aviation pilot deviations. However, Category D commercial aviation pilot deviations increased during FY 2003 though FY 2005 with a slight decrease in FY 2006. Category A and B commercial aviation runway incursions that were classified as pilot deviations represented five percent (14 of 273 incursions) from FY 2003 through FY 2006.

Operational Errors/Deviations

Nationally, there were 380 operational errors/deviations for the four-year period. Fifty-eight percent (222 incursions) of these involved at least one commercial aviation aircraft. From FY 2003 through FY 2006 the number of commercial aviation runway incursions classified as operational errors/deviations fluctuated with an increase to 60 incursions in FY 2006 from 54 in FY 2005. Category C and D runway incursions represented 93 percent of the commercial aviation operational errors/deviations (206 of 222 incursions).

The total number of Category A and B operational errors/deviations involving a commercial aircraft increased from FY 2003 through FY 2005 and decreased by one in FY 2006. Category A incursions increased during the four-year period with a total of four commercial aviation operational errors/deviations in FY 2006 compared to one in FY 2003. However, no Category B commercial aviation runway incursions were classified as operational errors/deviations in FY 2006.

Vehicle/Pedestrian Deviations

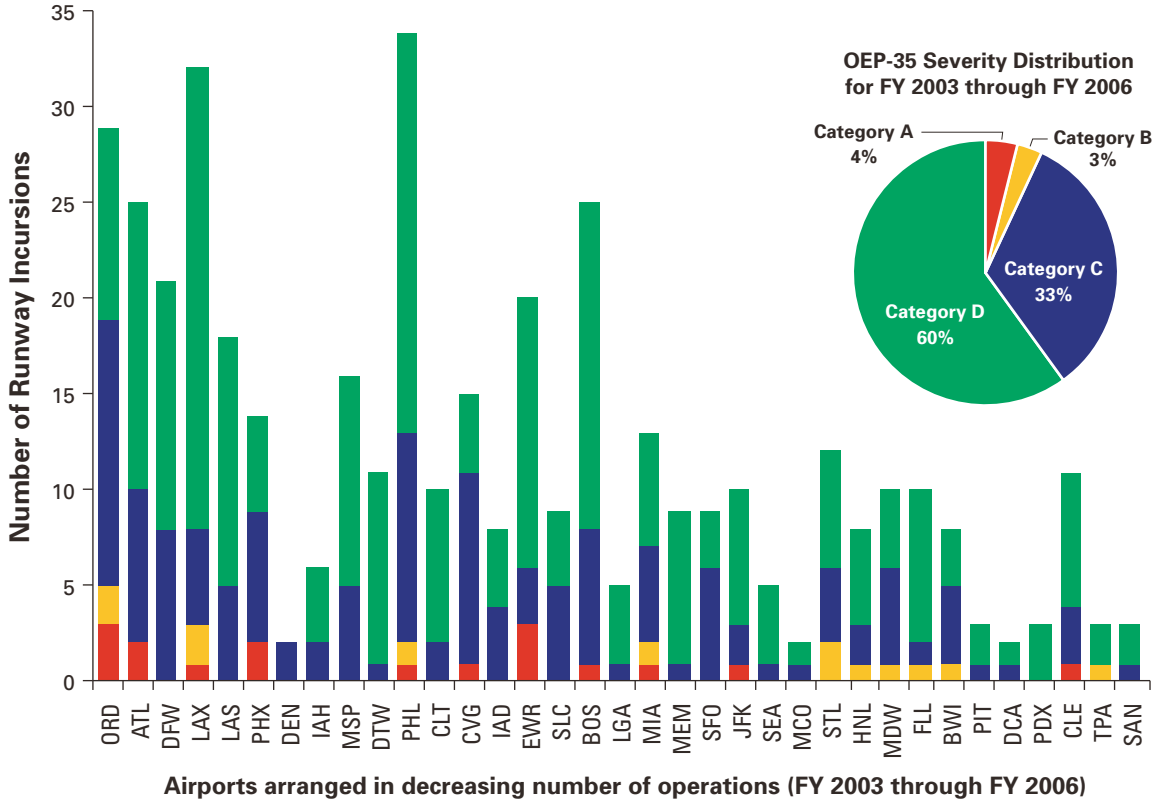
Nationally, from FY 2003 through FY 2006, there were 220 vehicle/pedestrian deviations. Of these events, 40 percent (87 incursions) involved at least one commercial aircraft. The number of commercial aviation vehicle/pedestrian deviations decreased from 26 incursions in FY 2003 to 17 in FY 2004. However, there was an increase in the following fiscal years, with a total of 24 incursions in FY 2006.

During the four-year period, the number of Category C and D vehicle/pedestrian deviations involving commercial aircraft fluctuated and averaged approximately 20 such incursions per year. Category A and B commercial aviation vehicle/pedestrian deviations represented eight percent (seven of 87) of these incursions from FY 2003 through FY 2006. Five of these seven incursions were Category A; the number of Category A incursions fluctuated during this period. Category B commercial aviation incursions classified as vehicle/pedestrian deviations decreased from two in FY 2003 to zero in each of the following years included in this period.

Runway Incursions at Airports with Predominantly Commercial Aircraft Operations

The FAA evaluated how airport-specific factors, such as the composition of aircraft operations, might interact with traffic volume to affect the likelihood of runway incursions. Runway incursion trends were examined for airports that predominantly handle commercial operations and have a large volume of traffic. The FAA examined the airports identified in the FAA Operational Evolution Partnership (OEP)—OEP-35 airports—because these airports manage mostly commercial operations and the FAA considers these airports to be significant drivers of NAS performance in terms of system capacity.

Figure 18
Number and Severity of Runway Incursions at the OEP-35 Airports (FY 2003 through FY 2006)

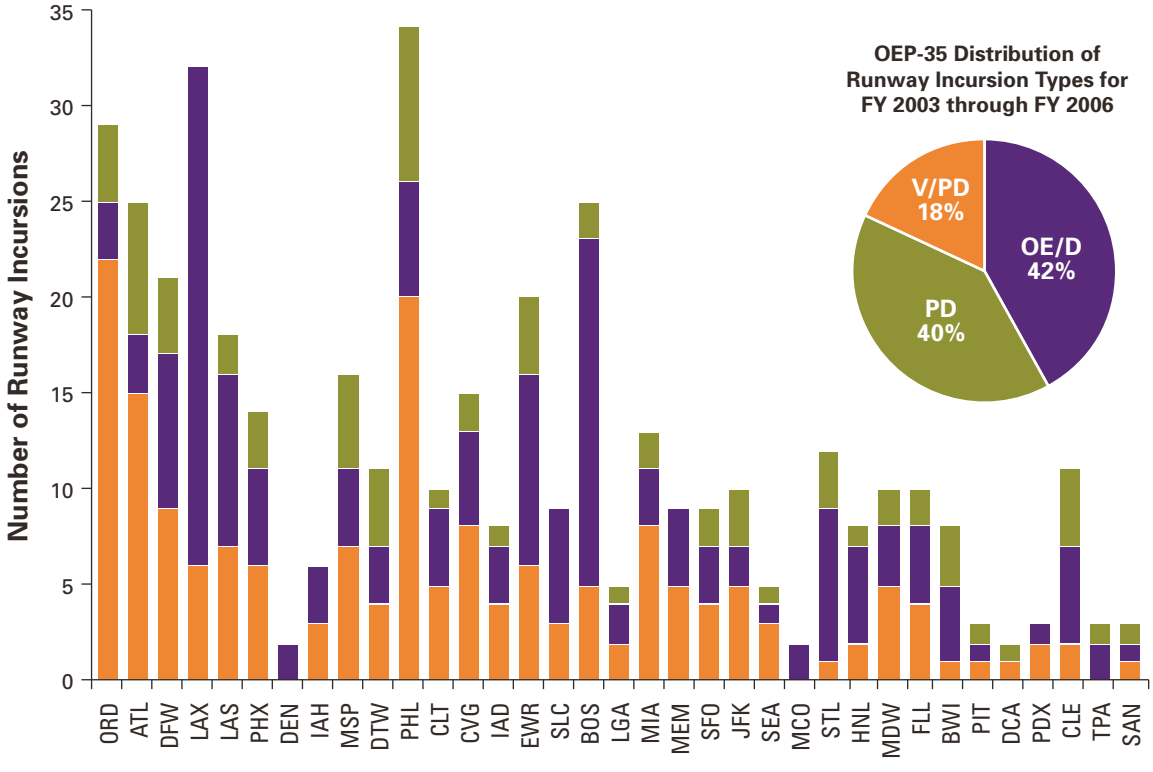


From FY 2003 through FY 2006, the OEP-35 airports accounted for 32 percent (421 of 1,306) of the total number of runway incursions. This is comparable to the number of operations handled by these airports: 25 percent (approximately 62 million of approximately 250 million) of all NAS aircraft operations. Nineteen of the OEP-35 airports recorded 10 or more runway incursions from FY 2003 through FY 2006 *(see Figure 18)*; this accounted for 80 percent of the runway incursions (336 of 421 runway incursions).

Category C and D runway incursions represented 93 percent (391 of 421) of total incursions at the OEP-35 airports from FY 2003 through FY 2006. While the number of Category C and D incursions fluctuated during this four-year period, Category C runway incursions decreased from 38 in FY 2003 to 30 in FY 2006. Category D incursions, the least severe, increased from 56 in FY 2003 to 67 in FY 2006.

The OEP-35 airports accounted for 25 percent (30 incursions) of the 120 Category A and B runway incursions nationwide from FY 2003 through FY 2006. Category B incursions fluctuated during the four-year period with an overall decrease from five incursions during FY 2003 to three incursions during FY 2006. However, Category A incursions at the OEP-35 airports increased during the four-year period from two incursions during FY 2003 to seven incursions in FY 2006.

Figure 19
Number and Type of Runway Incursions at the OEP-35 Airports (FY 2003 through FY 2006)



Airports arranged in decreasing number of operations (FY 2003 through FY 2006)

Pilot Deviations at the OEP-35 Airports

From FY 2003 through FY 2006, 40 percent of the runway incursions at the OEP-35 airports (169 of 421 incursions) were pilot deviations *(see Figure 19)*. The OEP-35 airports accounted for 24 percent of the 706 pilot deviations (169 incursions) nationwide from FY 2003 through FY 2006. Category C and D pilot deviations at the OEP-35 airports represented a majority of the pilot deviations—94 percent (159 of 169 incursions)—from FY 2003 through FY 2006.

Operational Errors/Deviations at the OEP-35 Airports

Operational errors/deviations represented 42 percent of the runway incursions (177 of 421 incursions) at the OEP-35 airports from FY 2003 through FY 2006 *(see Figure 19)*. Ninety-two percent of operational errors/deviations at the OEP-35 airports were Category C and D (162 of 177 incursions). Category A and B operational errors/deviations at these airports fluctuated during this time period. While Category A incursions increased from one incursion in FY 2003 to three incursions in FY 2006, the number of Category B incursions decreased from three in FY 2005 to zero in FY 2006.

Vehicle/Pedestrian Deviations at the OEP-35 Airports

Vehicle/pedestrian deviations represented 18 percent of the runway incursions (75 of 421 incursions) at the OEP-35 airports from FY 2003 through FY 2006 *(see Figure 19)*. The number of vehicle/pedestrian deviations remained relatively flat during this time period. Ninety-three percent of the runway incursions classified as vehicle/pedestrian deviations at the OEP-35 airports were Category C and D events (70 of 75 incursions). While Category A incursions increased by one incursion from FY 2003 compared to FY 2006, the number of Category B incursions decreased to zero in FY 2006.

General Aviation Aircraft Involved In Runway Incursions

General Aviation Operations, as defined in this report, comprise all aviation activities other than military and scheduled air service (airlines). From FY 2003 through FY 2006, general aviation operations accounted for approximately 55 percent of all aircraft operations in the NAS. However, during this same period, 72 percent of the 1,306 runway incursions (937 incursions) involved at least one general aviation aircraft, which is disproportionate with the representation of general aviation in the NAS (55 percent). From FY 2003 through FY 2006, general aviation operations decreased slightly by an average of 700,000 operations per year.

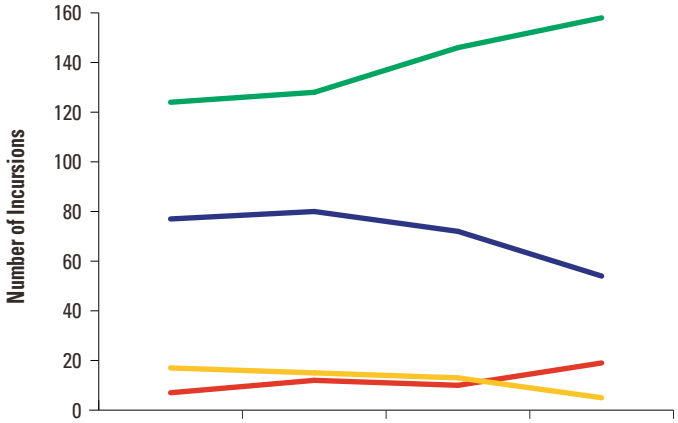
Severity of General Aviation Runway Incursions

Seventy-one percent of the Category C and D incursions nationally (839 of 1,186) involved at least one general aviation aircraft. The number of general aviation Category C incursions decreased from FY 2004 (80 incursions) to FY 2006 (54 incursions). However, the number of Category D incursions involving general aviation aircraft increased from FY 2003 (124 incursions) to FY 2006 (158 incursions) *(see Figure 20)*.

During this four-year period, 82 percent of Category A and B incursions nationally (98 of 120 incursions) involved at least one general aviation aircraft. The number of Category A and B general aviation incursions fluctuated throughout the four-year period. Category A incursions involving at least one general aviation aircraft increased by 90 percent between FY 2005 (10 incursions) and FY 2006 (19 incursions). However, Category B general aviation incursions decreased from FY 2005 (13 incursions) to FY 2006 (five incursions).

Figure 20

Severity of Runway Incursions Involving at Least One General Aviation Aircraft (FY 2003 through FY 2006)

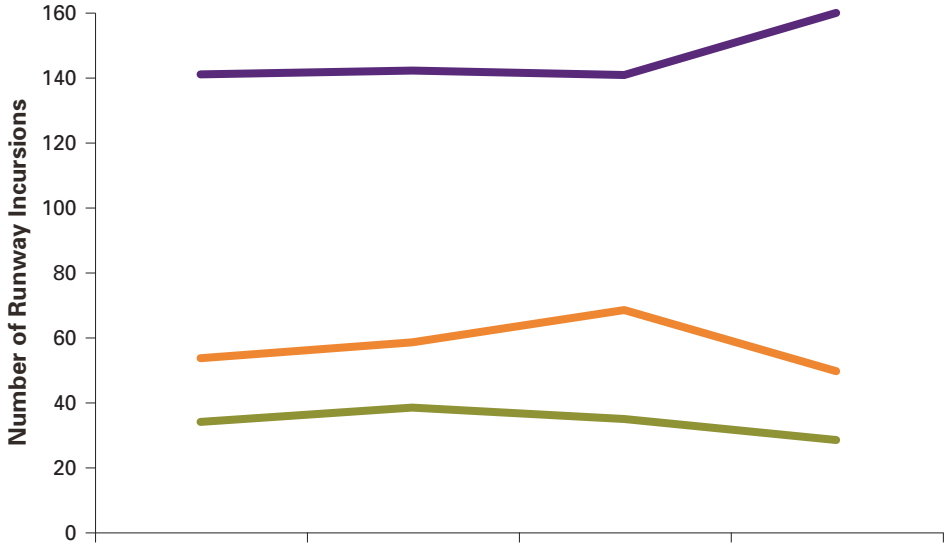


	FY 2003	FY 2004	FY 2005	FY 2006	Total
Category D	124	128	146	158	**556**
Category C	77	80	72	54	**283**
Category B	17	15	13	5	**50**
Category A	7	12	10	19	**48**
Total	**225**	**235**	**241**	**236**	**937**

Types of General Aviation Runway Incursions

The FAA examined the types of errors involved in general aviation runway incursions to better understand the circumstances involved and tailor runway safety management strategies accordingly.

Figure 21
Number of Runway Incursion Types Involving at Least One General Aviation Aircraft (FY 2003 through FY 2006)



	FY 2003	FY 2004	FY 2005	FY 2006	Total
Pilot Deviations	140	141	140	159	**580**
Operational Errors/ Deviations	53	57	67	49	**226**
Vehicle/Pedestrian Deviations	32	37	34	28	**131**
					937

Pilot Deviations

Nationally, 706 pilot deviations occurred during the four-year period; 82 percent of these runway incursions (580 incursions) involved at least one general aviation aircraft. From FY 2003 through FY 2005, the number and rate of general aviation pilot deviations remained relatively stable. However, these incursions increased by 14 percent in FY 2006 (140 incursions in FY 2005 to 159 in FY 2006).

Of the 580 pilot deviations involving at least one general aviation aircraft, 92 percent were Category C and D incursions (531 incursions) for the four-year period. Category C general aviation runway incursions classified as pilot deviations decreased from FY 2003 (50 incursions) to FY 2006 (34 incursions), a 32 percent decrease. Category D general aviation pilot deviations increased by 42 percent during this time period (77 incursions in FY 2003 compared to 109 incursions in FY 2006).

Eight percent of the pilot deviations involving general aviation aircraft (49 of 580 incursions) were Category A and B incursions. Category B general aviation pilot deviations decreased annually, from 10 incursions in FY 2003 to three incursions in FY 2006. However, Category A incursions, the most severe, represented four percent (24 of 580 incursions) of general aviation runway incursions classified as pilot deviations. These incursions fluctuated throughout the timeframe and increased from three in FY 2003 to 13 in FY 2006.

Operational Errors/Deviations

Of the 380 operational errors/deviations nationally, 59 percent (226 incursions) involved at least one general aviation aircraft *(see Figure 21)*. General aviation runway incursions classified as operational errors/deviations fluctuated from FY 2003 through FY 2006. There was an increase in the number of these incursions from FY 2003 through FY 2005, while FY 2006 saw a 27 percent decrease from FY 2005—making it the year with the lowest number of general aviation operational error/deviation occurrences in the four-year period.

The majority (84 percent) of all operational errors/deviations involving at least one general aviation aircraft were Category C and D incursions (189 of 226 incursions). During this four-year period, the number of Category C general aviation runway incursions classified as operational errors/deviations decreased by six events (22 incursions in FY 2003 compared to 16 incursions in FY 2006), while Category D incursions increased by one event from 25 in FY 2003 to 26 in FY 2006. Category A and B operational errors/deviations involving general aviation aircraft fluctuated during this four-year period and represented 16 percent (37 of 226 incursions) of these incursions. While Category B general aviation operational error/deviation incursions decreased during the four-year period, Category A incursions increased from three in FY 2003 to five in FY 2006.

Vehicle/Pedestrian Deviations

Nationally, there were 220 general aviation vehicle/pedestrian deviations during the four-year period, and 60 percent of these runway incursions (131 incursions) involved at least one general aviation aircraft *(see Figure 21)*. While there was an increase in the number of vehicle/pedestrian deviations involving at least one general aviation aircraft from FY 2003 to FY 2004, there was a downward trend in these incursions from FY 2004 through FY 2006. This resulted in a 13 percent decrease during the four-year period (32 incursions in FY 2003 compared to 28 incursions in FY 2006).

The majority (91 percent) of the general aviation vehicle/pedestrian deviations were Category C and D (119 of 131 incursions). While Category C incursions fluctuated during this period with a decrease from five in FY 2003 to four in FY 2006, Category D incursions remained relatively stable with an increase from 22 in FY 2003 to 23 in FY 2006. Nine percent of the vehicle/pedestrian deviations involving a general aviation aircraft (12 of 131 incursions) were Category A and B incursions. Of these events, Category B incursions decreased during the four-year period (four in FY 2003 compared to zero in FY 2006). Category A represented two percent (three of 131) of the general aviation vehicle/pedestrian deviations with zero incursions in FY 2005 and one event in each of the other fiscal years studied.

Runway Incursions at Airports with Predominantly General Aviation Aircraft Operations

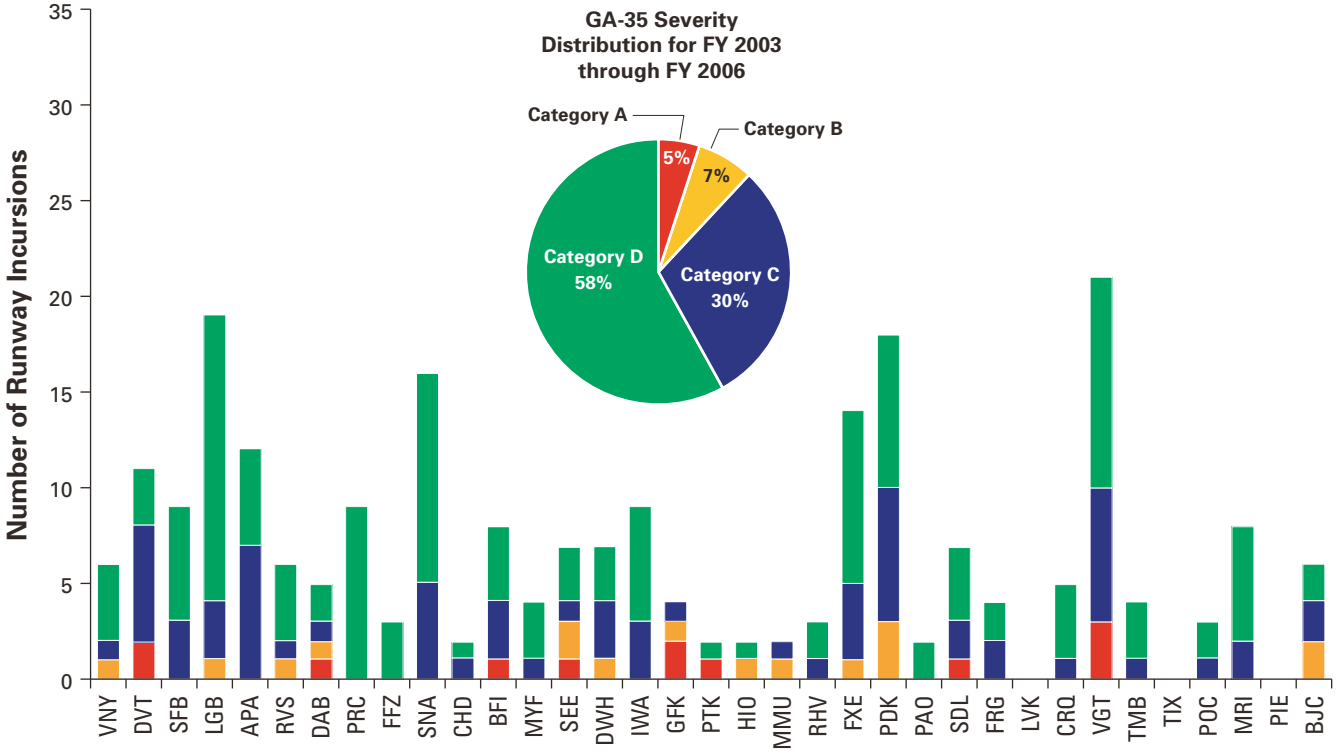
To explore the characteristics and trends for airports that are most frequently used by the general aviation community, the FAA analyzed runway incursion data for the 35 busiest airports in terms of the volume of general aviation traffic—the GA-35 airports. These airports were identified on the basis of the total number of general aviation operations handled during the four-year period. From FY 2003 through FY 2006, the GA-35 airports handled approximately eight million operations per fiscal year. General aviation operations comprised 93 percent of the traffic mix at GA-35 airports from FY 2003 through FY 2006. The number of general aviation operations at these airports decreased by an average of 200,500 operations annually, with the greatest decrease (236,497 operations) from FY 2003 to FY 2004.

Eighteen percent of the total number of runway incursions (238 of 1,306 incursions) occurred at GA-35 airports during the four-year period; this is in proportion with the amount of traffic handled by these airports (13 percent of all operations). Seven of the GA-35 airports recorded 10 or more runway incursions from FY 2003 through FY 2006, which accounted for 47 percent of the runway incursions (111 of 238 runway incursions).

There was an upward trend in the number and rate of runway incursions at the GA-35 airports from FY 2003 to FY 2005 which was followed by a decrease in occurrences (38 percent) in FY 2006. In FY 2005, there were 81 runway incursions at the GA-35 airports. In FY 2006, there were 50 runway incursions at the GA-35 airports.

From FY 2003 through FY 2006, 88 percent of runway incursions (210 of 238 incursions) at the GA-35 airports were Category C and D events *(see Figure 22)*. The remaining 12 percent (28 incursions) were the more serious, Category A and B, events.

Figure 22
Number and Severity of Runway Incursions at GA-35 Airports (FY 2003 through FY 2006)



Pilot Deviations at the GA-35 Airports

The majority (63 percent) of runway incursions at the GA-35 airports were pilot deviations (150 of 238 incursions) *(see Figure 23)*. From FY 2003 through FY 2006, the number of GA-35 pilot deviations increased by 11 percent (35 incursions in FY 2003 compared to 39 incursions in FY 2006).

Operational Errors/Deviations at the GA-35 Airports

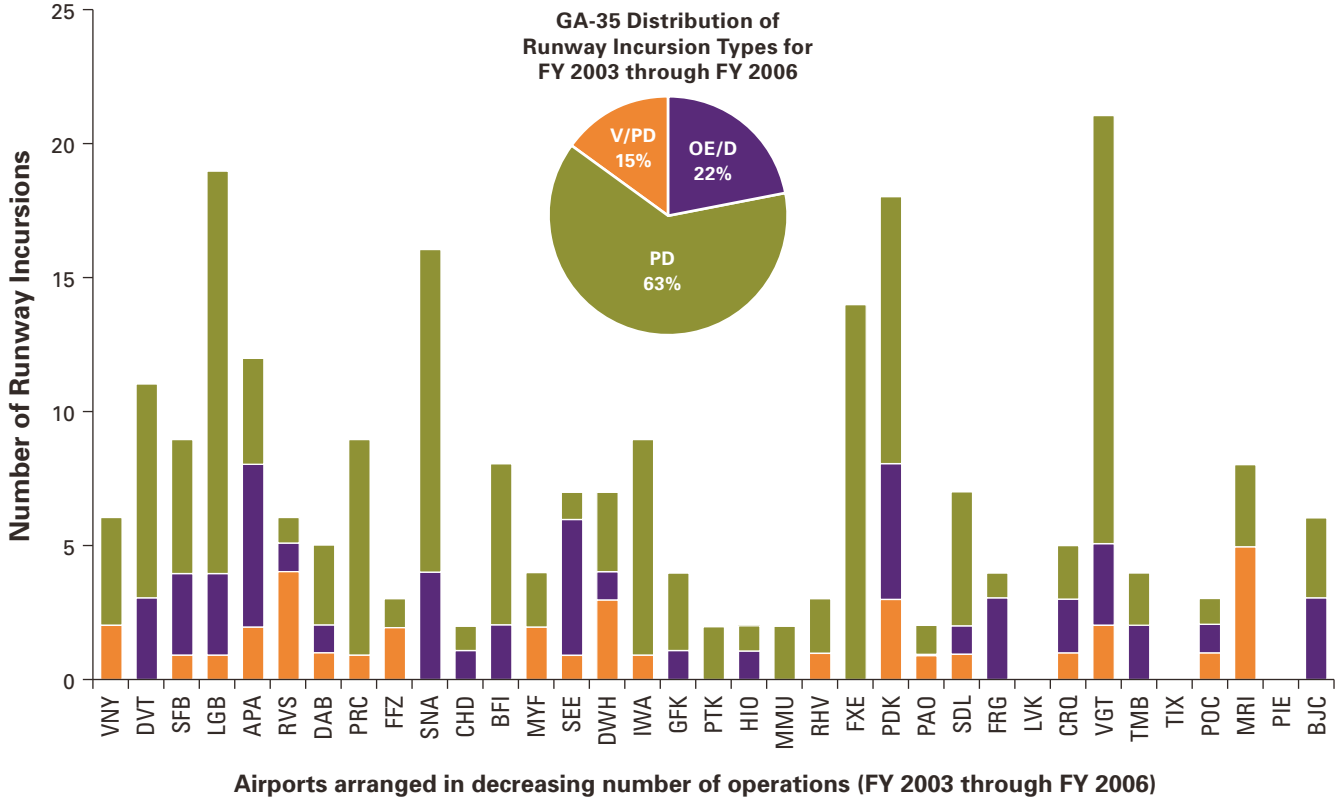
Operational errors/deviations represented 22 percent of runway incursions (52 of 238 incursions) at the GA-35 airports. The number of these incursions fluctuated during the four-year period with the highest number (23 incursions) occurring in FY 2005 and the lowest number (seven incursions) occurring in FY 2006.

Over the four-year period, Category C and D incursions represented 83 percent of the incursions (43 of 52 incursions) while Category A and B incursions represented 17 percent (nine of 52 incursions).

Vehicle/Pedestrian Deviations at the GA-35 Airports

Vehicle/pedestrian deviations represented 15 percent of the total runway incursions (36 of 238 incursions) at the GA-35 airports. The number of these incursions fluctuated during the four-year period with a 20 percent decrease overall (five incursions in FY 2003 compared to four incursions in FY 2006).

Figure 23
Types of Runway Incursions at the GA-35 Airports (FY 2003 through FY 2006)



Summary of NAS Performance

THE FAA COMPLETED AN ANALYSIS of reported runway incursions from FY 2003 through FY 2006. National trends were investigated to determine the frequency, severity, and types of runway incursions that occurred during the four-year period. Both commercial aviation and general aviation operations were explored to assess their involvement in runway incursions across the NAS and at airports that predominantly handled their respective operations—OEP-35 and GA-35 airports. A summary of these findings is presented below.

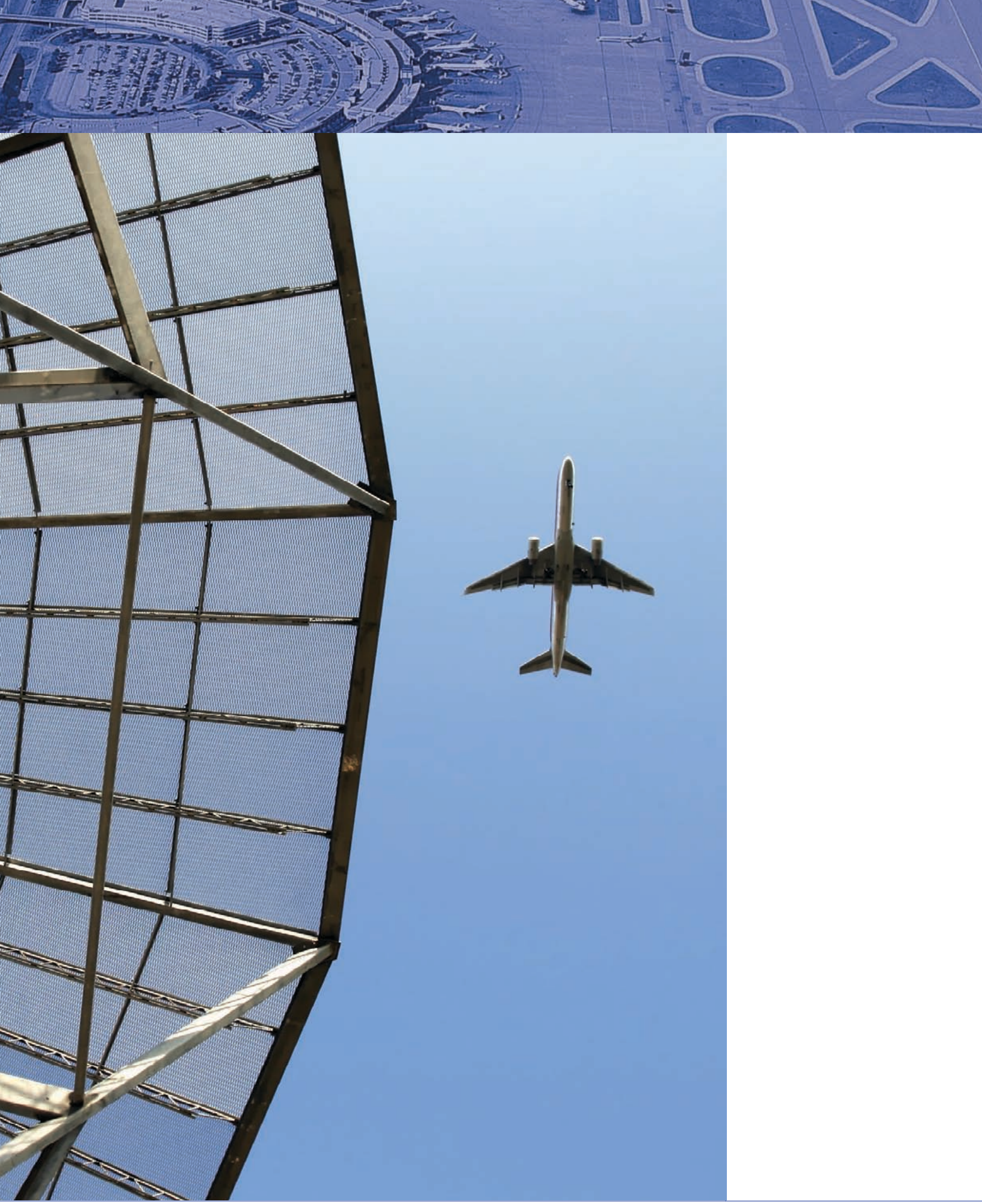
Frequency—The number and the rate of runway incursions reported in the NAS from FY 2003 through FY 2005 remained fairly stable; however, a slight increase was observed in FY 2006. Of the more than 500 towered airports, 215 airports (43 percent) had zero runway incursions during the period. Seventy-two percent of runway incursions involved general aviation aircraft, while 45 percent involved commercial aircraft. Of the 1,306 runway incursions in the NAS from FY 2003 through FY 2006, 32 percent occurred at the OEP-35 airports and 18 percent occurred at the GA-35 airport. This is proportionate with the amount of traffic handled by these airports.

Severity—The majority (91 percent) of runway incursions from FY 2003 through FY 2006 were Category C and D events that involved little or no risk of collision. The Category A and B incursion rate for FY 2006 was 0.51 incursions per million operations, which is seven percent less than the FY 2006 performance target of 0.55 incursions per million operations.

Pilot Deviations—From FY 2003 through FY 2006, pilot deviations represented 54 percent of the runway incursions in the NAS. The rate of pilot deviations remained relatively consistent, but then increased in FY 2006. The majority (82 percent) of pilot deviations in the NAS involved at least one general aviation aircraft.

Operational Errors/Deviations—Over the four year period, operational errors/deviations accounted for 29 percent (380 of 1,306) of all runway incursions. While these runway incursions increased from FY 2004 to FY 2005 there was a 15 percent decrease in FY 2006.

Vehicle/Pedestrian Deviations—From FY 2003 through FY 2006, vehicle/pedestrian deviations accounted for 17 percent of all runway incursions. During the four-year period, there was a 15 percent decrease in the number of vehicle/pedestrian deviations.



Initiatives and Future Directions

IMPROVING RUNWAY SAFETY REQUIRES A COLLECTION OF INITIATIVES, each providing incremental benefits. The FAA prioritizes and assesses each initiative for its safety value. Throughout the NAS and the FAA, a variety of efforts have been employed with the aim of systematically reducing exposure to risk.

ICAO Runway Incursion Definition and Severity Classification

As part of the its Flight Plan goal for International Leadership, the FAA supported the efforts of ICAO to establish standard definitions for runway incursion and runway incursion severity *(see Figure 24)*. This will eventually allow the collection of comparable data and enable the building of a comprehensive database of global information that may be used to enhance runway safety management.

Figure 24
Comparison between FAA and ICAO Runway Incursion Severity Definitions

FAA Runway Incursion Definition	ICAO Runway Incursion Definition
Any occurrence in the airport runway environment involving an aircraft, vehicle, person, or object on the ground that creates a collision hazard or results in a loss of required separation with an aircraft taking off, intending to take off, landing, or intending to land.[4]	Any occurrence at an aerodrome involving the incorrect presence of an aircraft, vehicle or person on the protected area of a surface designated for the landing and take-off of aircraft.[5]

Currently, the FAA reviews all surface incidents (SIs), identifies a subset as runway incursions, and assigns a severity. Effective October 1, 2007, the FAA will categorize runway incursions using the ICAO definition of incursions and the ICAO severity categories. Figure 25 shows a comparison between FAA and ICAO runway incursion severity classifications.

[4] *FAA Order 7050-1*

[5] *Presentation to Regional Aviation Safety Seminar for the Middle East, North African and Gulf Regions Nicosia, Cyprus 16-17 November 2006. Mohamed R. M. Khonji, ICAO Middle East Regional Director, Cairo*

Figure 25
FAA and ICAO Runway Incursion Severity Classification Comparison

FAA		ICAO	
Class	**Description**	**Class**	**Description**
A	Separation decreases and participants take extreme action to narrowly avoid a collision, or the event results in a collision.	**Accident**	Refer to ICAO Annex 13 definition of an accident.
		A	A serious incident in which a collision was narrowly avoided
B	Separation decreases and there is a significant potential for a collision.	**B**	An incident in which separation decreases and there is a significant potential for collision, which may result in a time critical corrective/evasive response to avoid a collision.
C	Separation decreases, but there is ample time and distance to avoid a potential collision.	**C**	An incident characterized by ample time and/or distance to avoid a collision.
D	Little or no chance of a collision but meets the definition of a runway incursion.		
Other SI	An event during which unauthorized or unapproved movement occurs within the movement area or an occurrence in the movement area associated with the operation of an aircraft that affects or could affect the safety of flight. (This subset includes only non-conflict events)	**D**	Incident that meets the definition of runway incursion such as incorrect presence of a single vehicle/person/aircraft on the protected area of a surface designated for the landing and take-off of aircraft but with no immediate safety consequences.
		Not Defined	(FAA non-conflict SI include more than just ICAO class "D" events.)
ID	Insufficient Data: inconclusive or conflicting evidence precludes severity assessment.	**E**	Insufficient information: inconclusive or conflicting evidence precludes severity assessment.

The FAA's expansion of the definition of a runway incursion to harmonize with the ICAO definition will lead to an increase in the total number of runway incursions and a change in the United States runway incursion severity distribution. For instance, runway incursions currently categorized as Category C or D under the FAA definition will become Category C incursions under the ICAO definitions. Figure 26 shows a comparison of runway incursion frequency for the last four years using both the FAA and ICAO definitions.

Figure 26
Runway Incursion Counts Applying FAA and ICAO Definition

FAA Definition			FAA Application of ICAO Definition		
Class	**Fiscal Year**	**Count**	**Class**	**Fiscal Year**	**Count**
A	2003	10	A[6]	2003	10
	2004	12		2004	12
	2005	13		2005	13
	2006	24		2006	24
B	2003	22	B	2003	22
	2004	16		2004	16
	2005	15		2005	15
	2006	7		2006	7
C	2003	110	C	2003	291
	2004	120			
	2005	95		2004	298
	2006	75			
D	2003	181		2005	298
	2004	178			
	2005	203		2006	299
	2006	224			
Other SI	2003	544	D[7]	2003	260*
				2004	178*
	2004	514		2005	203*
				2006	476*
	2005	573	Other SI	2003	284*
				2004	336*
	2006	627		2005	370*
				2006	151*
Total RIs	2003	323	Total RIs	2003	583
	2004	326		2004	504
	2005	327		2005	530
	2006	330		2006	806

6 *The FAA will capture collisions within Category A runway incursions in their application of the ICAO definition planned for FY 2008.*

7 *ICAO class "D" is a subset of the combined total of Runway Incursion and Non-Runway Incursion counts.*

* *Estimated values.*

By broadening the runway incursion definition, a greater amount of data will be analyzed, and at-risk behaviors/circumstances that might have caused a runway incursion if another aircraft had been present will be identified. For example, in August 2006 in Lexington, Kentucky Comair 5191 was cleared for takeoff from Runway 22. Tragically, the aircraft mistakenly used Runway 26, a 3,500 foot runway, which was too short, resulting in a fatal accident. Because no other aircraft was present, this was categorized as a SI, not a runway incursion.

ICAO Hot Spots

The FAA developed a draft definition of a "Hot Spot"—A location on an aerodrome movement area with a history or potential risk of collision or runway incursion, where heightened attention by pilots/drivers is necessary. This proposal was shared with ICAO's Air Navigation Commission to be included in Annex 4 and Procedures for Air Navigation Services—Air Traffic Management (PANS-ATM) Doc 4444. The Air Navigation Commission conducted a final review of the proposal in the last quarter of 2006, for an applicability date of November 2007. Hot Spots will also be added to National Aeronautical Charting Office diagrams at that time.

ICAO Manual for Preventing Runway Incursions

The ICAO Manual for Preventing Runway Incursions, which was jointly developed by the FAA, EUROCONTROL, and Airservices Australia, is used to educate controllers, pilots and drivers on runway safety. Completed in 2007, this manual is now the basis of a course that will be taught at the FAA Academy.

Runway safety is a shared responsibility. The following examples of advances through technology, infrastructure, tools, and training/safety promotion demonstrate the Industry's, Airport Operator's, and FAA's concerted and wide-spread efforts to improve runway safety.

Technology

Facility-Based Controller Notification Equipment

The **Airport Movement Area Safety System (AMASS)** will visually and aurally prompt tower controllers to respond to situations on the airfield that potentially compromise safety. AMASS is an add-on enhancement to the host ASDE-3 radar that provides automated alerts and warnings to potential runway incursions and other hazards. AMASS extends the capability of the ASDE-3, enhances surface movement safety and is currently operational at 33 airports.

Airport Surface Detection Equipment, Model X (ASDE-X) is an even more sophisticated surface detection technology. While AMASS is radar-based, meaning signals could be less accurate in rain and fog, ASDE-X integrates data from a variety of sources, including radars and aircraft transponders, to give controllers a more reliable view of airport operations. ASDE-X capabilities will be added to many of the sites that already have AMASS, as well as to other busy airports.

ASDE-X enables air traffic controllers to detect potential runway conflicts by providing detailed coverage of movement on runways and taxiways. By collecting data from a variety of sources, ASDE-X is able to track vehicles and aircraft on the airport movement area and obtain identification information from aircraft transponders. As displayed in Appendix C.3, ASDE-X is slated for operation at 35 airports.

Ground-Based Flight Crew Notification Equipment

Final Approach Runway Occupancy Signal (FAROS)—The FAA is testing new technologies that will alert pilots to potential runway incursions. The FAROS test system at Long Beach Airport (LGB) is a fully automated system using inductive loop sensors embedded in the runway and taxiway surfaces to detect aircraft and vehicles entering and exiting the monitored zones. When the runway is occupied by a potentially hazardous target, the system flashes the Precision Approach Path Indicator (PAPI) lights as a visual indicator to pilots on approach without controller input.

As illustrated in Figure 27 and Figure 28, Runway 30 at LGB is monitored at three areas commonly used for departures and runway crossings. These three areas are called activation zones.

Figure 27
Long Beach FAROS System

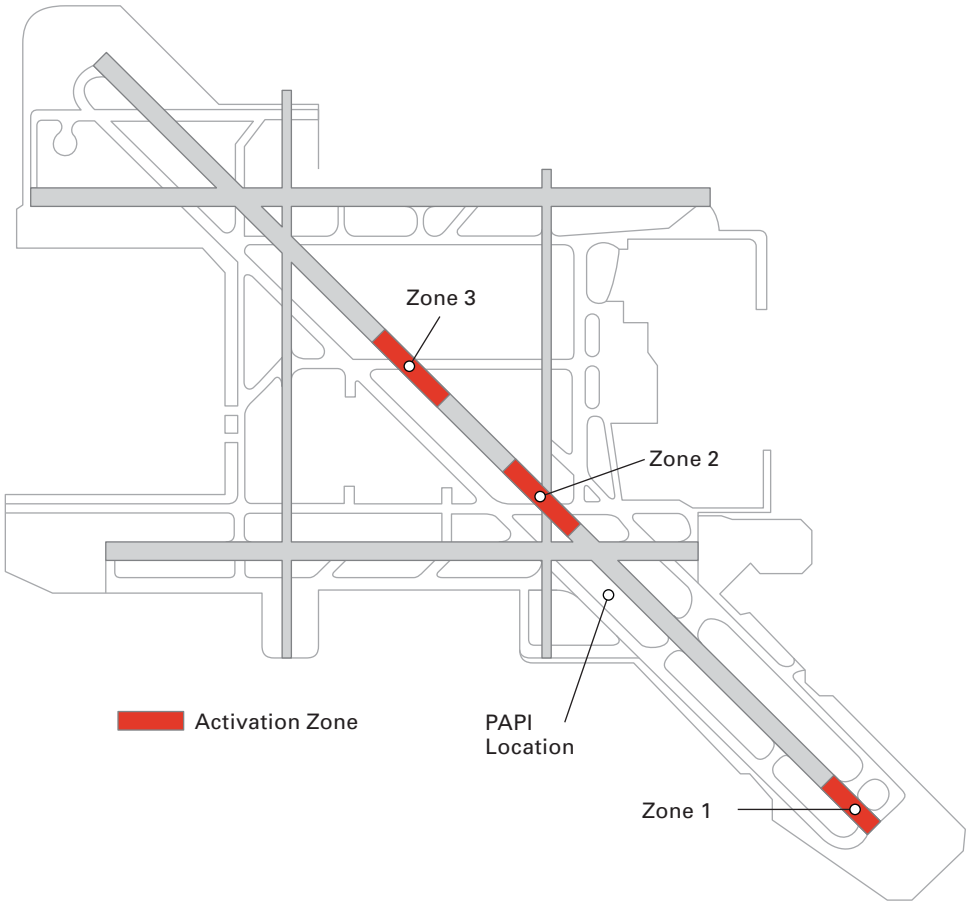
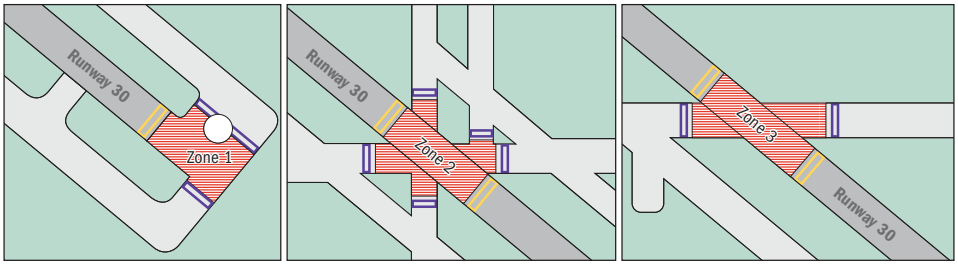


Figure 28
Long Beach FAROS System Intersection Runway Logic

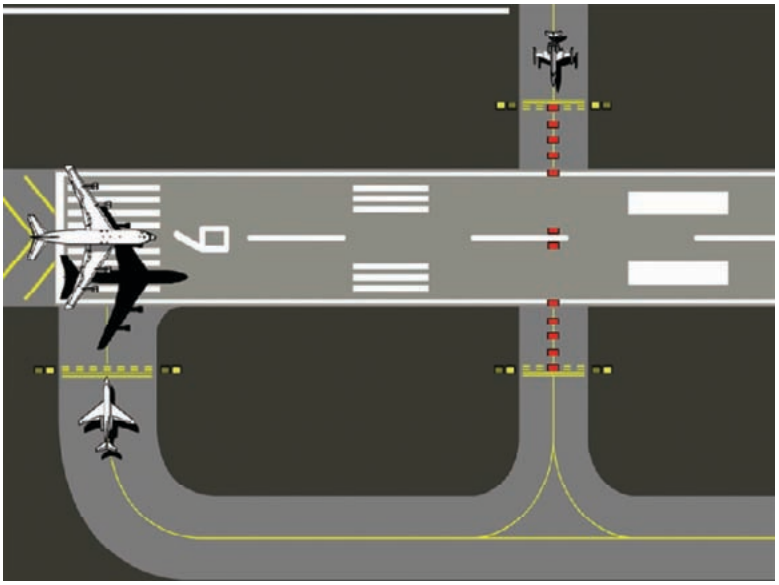


Runway Status Lights (RWSL) are another technology the FAA is testing that will alert pilots to potential runway incursions. Surface and terminal surveillance systems, such as ASDE-X and AMASS, detect the presence and motion of aircraft and vehicles on or near the runways; the Runway Status Light safety logic then assesses any possible conflicts with other surface traffic. Red in-pavement runway entrance lights are illuminated if the runway is unsafe for entry or crossing, and red in-pavement takeoff hold lights are illuminated if the runway is unsafe for departure.

RWSL are a supplement to existing pilot procedures, training and visual monitoring. The lights offer a means of reducing hazardous runway incidents by indicating to pilots and vehicle operators that a runway is unsafe for entry/crossing or that a runway is unsafe for departure. The lights operate automatically and are controlled via processing of surface surveillance information without the need for controller input. They illuminate whenever the runway is occupied by traffic that would represent a hazard to other aircraft.

Two functional elements comprise the current RWSL system. **Runway Entrance Lights (RELs)** *(see Figure 29)* indicate when a runway is unsafe for entry by providing a signal (a single string of red lights in the pavement) to aircraft or vehicles preparing to enter or cross a runway from an intersecting taxiway. They are placed at runway-taxiway intersections where they are visible to pilots or drivers about to enter or cross the runways. The RELs illuminate at a particular intersection when high-speed traffic is projected to pass through the intersection.

Figure 29
Runway Entrance Lights



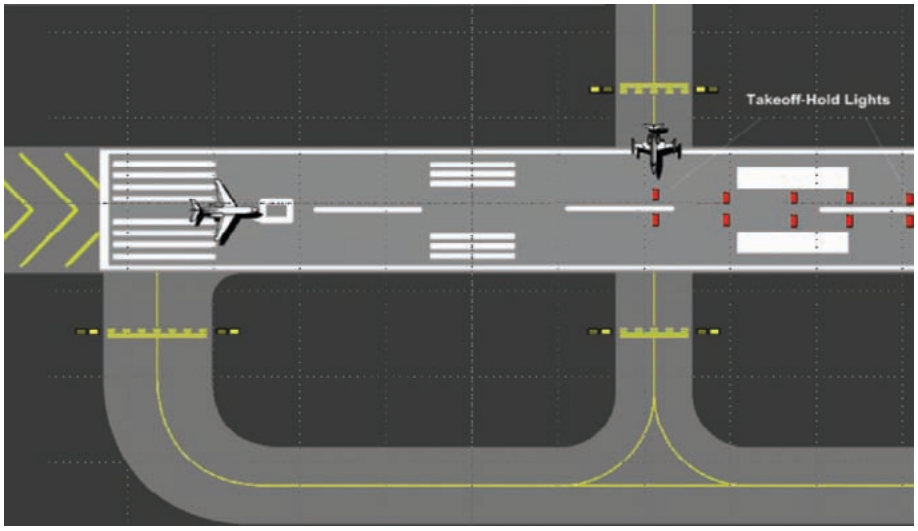
The operational evaluation of the RELs using ASDE-X surface surveillance was completed in June, 2005 at Dallas-Fort Worth International Airport (DFW), and the system showed promising results. The lights were compatible with the tempo and style of operations at a busy airport, there was no increase in air traffic controller workload, and the lights proved useful to pilots. An enhanced lighting configuration is being installed on two additional runways at DFW in 2008. The evaluation of RWSL with AMASS began in 2007 at San Diego Lindbergh Field.

The second RWSL functional component, **Takeoff-Hold Lights (THLs)** *(see Figure 30)* advises pilots when the runway is unsafe for take-off, due to traffic on the runway, by providing a signal (a double string of red lights in the pavement that are six feet on either side of the runway centerline) to aircraft in position for takeoff. THLs are placed near the takeoff position where they are visible to pilots about to depart from a runway. Like

RELs, THLs are automatically controlled by real-time processing of surface surveillance information; they illuminate when an aircraft or vehicle is on or about to be on the runway ahead of an aircraft in position for takeoff. THLs were installed and have been under evaluation at DFW since January, 2006.

In July 2007, the Joint Resources Council approved the initial investment decision for RWSL. The system is currently planned for deployment at 19 airports, but the model used to select these airports is being reviewed, which may result in a revised number and selection of airports. The installations are planned for 2008-2013, but alternative accelerated deployment schedules are being reviewed.

Figure 30
Takeoff Hold Lights



On-Board Flight Crew Notification Systems

Over the last few years, paper charts and manuals have increasingly been replaced by the Electronic Flight Bag (EFB), an electronic display system that gives pilots information about a variety of aviation topics. These EFB's range from laptop-like devices totally independent of the aircraft that can be used on planes across the existing fleet, to high-end displays permanently installed and fully integrated into cockpits of newer aircraft. The FAA is focusing this effort on a third type of device, referred to as a "Class 2 system," that is still portable but takes its power and data directly from aircraft systems.

Most EFB's incorporate an Airport Moving Map, a display that provides a constantly updated view of an airport's runways, taxiways, and structures to help pilots identify and anticipate the airplane's location on the surface. Using Global Positioning System (GPS) technology, it is possible for the moving map to show pilots their actual positions ("own ship") on the airport surface.

After thoroughly reviewing safety information, including human factors research on the safety benefits of own ship position versus the potential safety risks, the FAA is changing the certification process to enable this technology to be available later this year while maintaining all appropriate safety standards.

Infrastructure

To improve airport infrastructure features that help increase pilots' awareness of their location on the airport—especially the runway holding position environment—the FAA worked with industry safety experts, human factors specialists, pilot and controller communities, and airport operators to develop enhanced surface markings and runway light configurations.

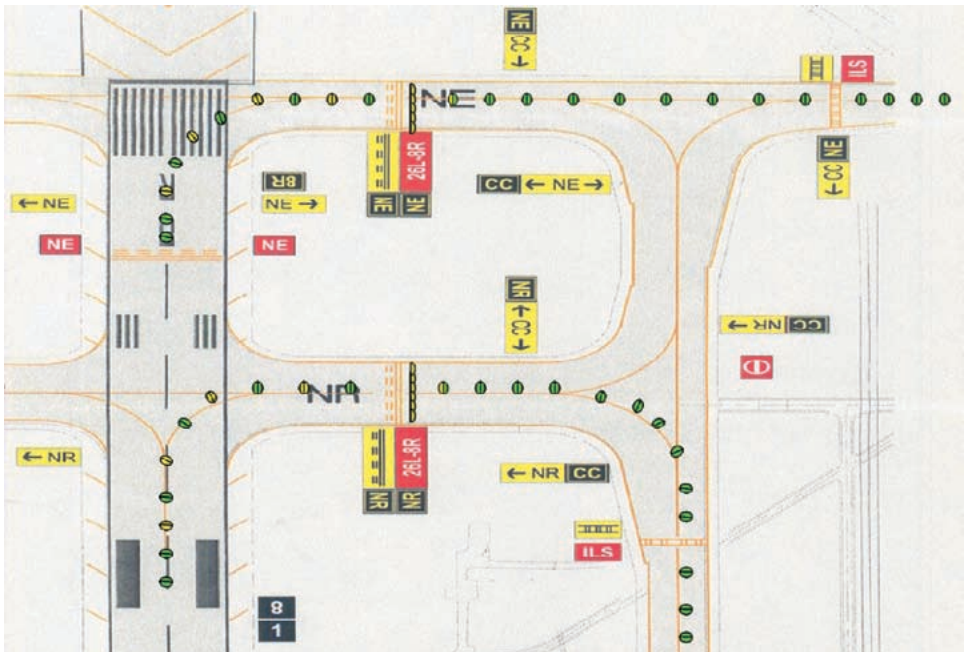
Runway Lead-On Lights—Effective February 1, 2007, Advisory Circular (AC) 150/5340-30B changed runway lead-on light standards to include a modified color pattern of taxiway centerline lead-on lights. As displayed in Figure 31 and Figure 32, the modification adds alternating yellow and green lights after the hold-short line to indicate a runway environment while continuing to use green centerline lights up to the hold-short line. This enhancement improves a flight crew's awareness of the runway environment by providing an additional visual indication that the aircraft is approaching the holding position marking and about to enter the runway environment. Previously, taxiway centerline lights extended from the apron to the runway with no distinction from lead-on lights.

Figure 31
Runway Lead-On Lights

Previous Configuration

New Configuration

Figure 32
Enhanced Runway Lead-On Lights



Perimeter Taxiways provide an alternate pathway for aircraft to travel between the runway and the gate without having to cross another runway. This infrastructure change offers improvements to surface safety due to the reduced number of runway crossings. Airports that operate parallel runway arrival and departure configurations may get the dual benefits of increased capacity and safety.

Hartsfield-Jackson Atlanta International Airport (ATL) was the first airport in the country to install a perimeter taxiway (Taxiway Victor), which opened in April 2007. It is expected to eliminate an average of 700 runway crossings per day and lead to millions of dollars in fuel savings by allowing airplanes that land on the northernmost runway to taxi to the gate area without hindering other takeoffs.

Construction has begun on perimeter taxiways for the southeast quadrant of DFW. Simulations have shown that the airport could experience significant reductions in departure delays, and in the number of runway crossings, which currently number 1,600 - 1,800 per day. Other benefits include relieving frequency congestion due to a decreased need for pilot-controller communications for ground control. DFW plans to complete the perimeter taxiway complex one quadrant at a time.

Enhanced Surface Markings—To increase the situational awareness of pilots and airfield drivers when they are approaching the hold-short line, the FAA changed the airfield markings (paint) standard, as stated in AC 150/5340-1J. These guidelines will be required for airports with annual passenger enplanes of 1.5 million or more, effective June 30, 2008.

This circular incorporates guidance on the use of the enhanced taxiway centerline markings and the surface holding position signs. Previously, taxiway centerlines were marked with a solid yellow line. The modification incorporates dashed yellow lines on either side of the solid line in the proximity of a runway *(see Figure 33)*. The enhanced taxiway centerline, the extension of existing holding position markings onto taxiway shoulders, and the enhanced use of the surface painted holding position signs were tested at Theodore Francis Green Airport (PVD) in Providence, Rhode Island.

Figure 33
Enhanced Surface Markings

Figure 34
Airports with Enhanced Taxiway Centerline Markings

State	Code	Airport	Complete
AK	ANC	Ted Stevens Anchorage International	■
AL	BHM	Birmingham International	
AZ	PHX	Phoenix Sky Harbor International	
	TUS	Tucson International	
CA	BUR	Bob Hope	■
	LAX	Los Angeles International	■
	OAK	Metropolitan Oakland International	■
	ONT	Ontario International	■
	SAN	San Diego International	■
	SFO	San Francisco International	
	SJC	Norman Y. Mineta San Jose International	
	SMF	Sacramento International	■
	SNA	John Wayne Airport-Orange County	■
CO	DEN	Denver International	
CT	BDL	Bradley International	
FL	FLL	Fort Lauderdale/Hollywood International	■
	JAX	Jacksonville International	
	MCO	Orlando International	
	MIA	Miami International	
	PBI	Palm Beach International	
	RSW	Southwest Florida International	
	TPA	Tampa International	■
GA	ATL	Hartsfield-Jackson Atlanta International	■
HI	HNL	Honolulu International	
	OGG	Kahului	■
ID	BOI	Boise Air Terminal/Gowen Field	
IL	MDW	Chicago Midway International	■
	ORD	Chicago O'Hare International	■
IN	IND	Indianapolis International	■
KY	SDF	Louisville International-Standiford Field	■
LA	MSY	Louis Armstrong New Orleans International	■
MA	BOS	General Edward Lawrence Logan International	■
MD	BWI	Baltimore/Washington International Thurgood Marshall	
MI	DTW	Detroit Metropolitan Wayne Country	
MN	MSP	Minneapolis-St Paul International/Wold-Chamberlain	■
MO	MCI	Kansas City International	
	STL	Lambert-St Louis International	■
NC	CLT	Charlotte/Douglas International	■
	RDU	Raleigh-Durham International	■

State	Code	Airport	Complete
NE	OMA	Eppley Airfield	■
NH	MHT	Manchester	■
NJ	EWR	Newark Liberty International	■
NM	ABQ	Albuquerque International Sunport	
NV	LAS	McCarran International	
	RNO	Reno/Tahoe International	
NY	ALB	Albany International	
	BUF	Buffalo Niagara International	■
	JFK	John F Kennedy International	■
	LGA	La Guardia	
OH	CLE	Cleveland-Hopkins International	■
	CMH	Port Columbus International	■
	CVG	Cincinnati/Northern Kentucky International	
OK	OKC	Will Rogers World	
	TUL	Tulsa International	
OR	PDX	Portland International	
PA	PHL	Philadelphia International	
	PIT	Pittsburgh International	■
PR	SJU	Luis Munoz Marin International	
RI	PVD	Theodore Francis Green State	■
TN	BNA	Nashville International	■
	MEM	Memphis International	■
TX	AUS	Austin-Bergstrom International	
	DAL	Dallas Love Field	
	DFW	Dallas/Fort Worth International	
	ELP	El Paso International	
	HOU	William P Hobby	
	IAH	George Bush Intercontinental/Houston	
	SAT	San Antonio International	
UT	SLC	Salt Lake City International	
VA	DCA	Ronald Reagan Washington National	■
	IAD	Washington Dulles International	
	ORF	Norfolk International	■
WA	GEG	Spokane International	■
	SEA	Seattle-Tacoma International	■
WI	MKE	General Mitchell International	■

Tools

Facility Safety Assessment System (FSAS)

The Facility Safety Assessment System (FSAS) is a database tool that supports the new facility self-evaluation process. Data collected during facility self-evaluations and facility audits conducted by Safety Services/Investigations & Evaluations as well as the associated mitigation strategies are entered into FSAS. Facility managers and evaluators are able to mine the data to see how their facilities compare to others across the nation. At the Service Area and national levels, users are able to see the facilities progress and identify nationwide trends. FSAS does not impose rules and regulations; it serves as an information sharing tool. It does not pull information from other databases but will be part of Business Objects, a software program that pulls together multiple databases. A main goal of the FSAS tool is to emphasize successful, accurate reporting of safety issues and dissemination of safety information to identify NAS-wide safety trends that require further attention. Facilities having the same problems in their operations are able to share their plans and mitigation strategies.

In FY 2006, Safety Services requested that all FAA facilities except Automated Flight Service Stations (AFSSs) perform self-evaluations and enter their findings into FSAS. All 537 facilities that performed evaluations contributed to the identification of approximately 4000 safety items. Of these facilities over 140 facilities found no problems. Potential safety issues, such as Taxi Into Position and Hold (TIPH) and conflict alert, appeared in FSAS entries and rose to the top as national issues. Currently, the data deposited in FSAS are provided to the ATO Executive Council and Terminal and En Route Operations on a regular basis.

FSAS 1.5 is scheduled to be released in November, 2007. This release will include the addition of a self-assessment checklist for the Traffic Management Units and user upgrades such as search functionalities. These expansions broaden the scope of self evaluation beyond Terminal Services to include the Command Center and System Operations. Other future releases will include self-assessment checklists for Technical Operations, allowing maintenance personnel to review their safety performance.

Database Management Reporting System (DMRS)

The Database Management Reporting System (DMRS) is a centralized repository of safety, aircraft, and airport-related information that allows internal FAA users access to a secure web-based reporting system from any Internet connection. To provide a systems view helpful in analyzing runway incursion and other safety-related information, DMRS draws information from the following five data sources:

- Office of Runway Safety Surface Incident Database
- RSAT Database
- Aviation System Standards (AVN) Database
- RIIEP Database
- Airport Diagrams: A database of official airport diagrams of FAA towered airports

Training/Safety Promotion

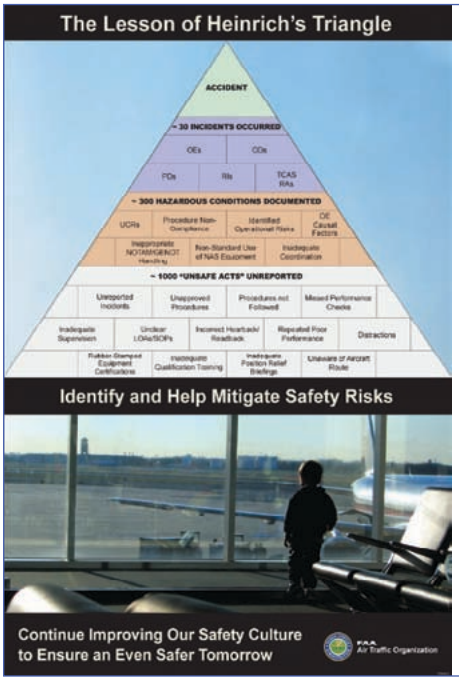
Crew Resource Management (CRM)

Safety Services developed a comprehensive and still-evolving Crew Resource Management (CRM) program to address human factors in air traffic control towers. CRM has been used with documented success in airline, military, space flight, surgical, and other high performance teams.

CRM is introduced with a one-day workshop, "Crew Resource Management: Human Factors for Air Traffic Controllers." The intent of this course is to help controller teams detect and correct controller and pilot mistakes, before they result in operational errors or accidents. This course provides a one-day human factors workshop for all operational air traffic operations personnel—from field managers to controllers—to improve teamwork, improve individual performance, and manage threats and errors. CRM is an organizational effort designed to develop a lasting and effective operational safety culture, improving facility-level operations and procedures.

The workshop is designed to allow managers and controllers in each facility to brainstorm, discuss, and determine how to best apply the CRM principles and methods. As reinforcement, CRM posters are delivered to facilities where the training is presented.

Since May 2005, over 500 people have received CRM training provided in Houston, Oakland, Phoenix, Las Vegas, Philadelphia, Miami, Boston, Chicago, Charlotte, Salt Lake City, Detroit, and Los Angeles towers. Planning for CRM at En Route Centers is in progress.



Air Traffic Adaptation of Heinrich's Triangle

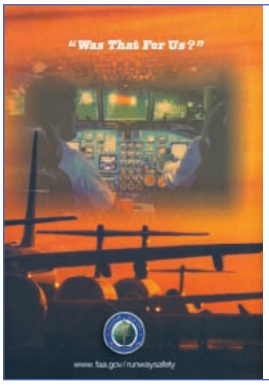
In FY 2006, ATO Safety Services distributed a poster adaptation of Heinrich's Triangle to demonstrate that as the ATO aims to prevent air traffic accidents, there are a greater number of less severe events that may guide accident prevention efforts. The poster's objective is to encourage employees to report these less severe events to improve information sharing about hazards within the NAS.

BASICs, Tower Best Practices Training Videos

A joint effort by Terminal Services and Safety Services to reduce operational errors in the terminal environment are the BASICs—Tower Best Practices Training Videos. BASIC stands for **B**e sure the runway is open, **A**ircraft position verified, **S**can the runway, **I**ssue clearances using correct phraseology, and **C**lose the loop by getting an accurate readback. These videos are intended to reduce operational errors by focusing on basic control principles and procedures. The effort initially focuses on surface safety (i.e., reducing runway incursions) and will consist of a series of DVDs to highlight best practices that could be used to eliminate some common operational errors. The introductory DVD was completed and available in September of 2006. The "B" DVD was released in December, 2006, followed by the "AS" DVD release in April 2007. The "IC" DVD is planned for release in September 2007, completing the set. A decision was recently made to develop similar videos for the En Route Centers and TRACONs in FY 2008.

Listen Up, Read Back, Fly Right

This DVD is a video for pilots on proper techniques and phraseology when communicating with the tower.



"Was That for Us?"

This DVD is a course for air carrier transport pilots on ground movement safety. Specific course elements focus on procedures and actions directly related to runway incursion prevention.

ICAO/FAA Runway Incursion Prevention Course

The ICAO/FAA Runway Incursion Prevention Course is aimed at reducing the risk of runway incursions and increasing runway safety at airports worldwide. This course will be the result of the development and implementation of an ICAO TrainAir Program based on the ICAO Runway Safety Manual, which was initially for pilots and air traffic controllers and later for vehicle operators & managers. The FAA Academy will be assisting in the development of these courses. Presently, the FAA is working on defining requirements prior to signing a Management Service Agreement with ICAO. The estimated completion date of all four courses is December, 2008.

Runway Safety Packets

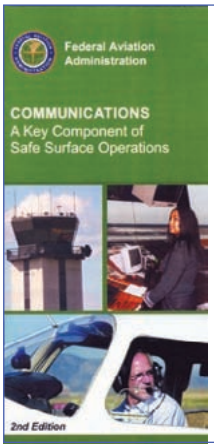
Packets of runway safety educational material are assembled for distribution to a variety of customers. The primary distribution is via general aviation aircraft manufacturers; several major manufacturers, and also some maintainers, include a packet in the cockpit of each new plane. In addition, packets have been given to eleven major air carriers, and one packet was shipped to each airport along with a copy to each of the flight school managers.

Aviation academia also ensures students receive these packets to include 300 flight schools and the FAA Academy training for the Part 142 Training Centers and the Part 147 Aviation Maintenance Technician Schools. The Flight Safety International School has also added a runway safety block of instruction to its curriculum in which these packets are given to students. Over 20,000 packets have been distributed, and another 6,000 are in production. This low-cost effort contributes to a change in the safety culture.

Figure 35
Runway Safety Packets

Safety Brochures

Position and Hold



Communications: A Key Component of Safe Surface Operations

For information on runway safety publications, go to **www.faa.gov/runwaysafety**.

The FAA forecasts an increase in the number of operations over the next decade. Proactive safety initiatives will be required to further reduce the runway incursion rate and achieve the FAA's performance goal for runway safety. To achieve sustained runway safety performance, the FAA will support a safety culture in which each employee sees his or her role as a critical part of the safety of the NAS, implement initiatives such as the establishment of an ICAO standard definition of runway incursions and runway incursion severity, identify new measures to anticipate emerging risks, and develop safety management strategies to continue improving runway safety.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SILENT WINGS MUSEUM

Appendices

Runway Incursion Trends at Towered Airports in the United States, FY 2003 through FY 2006

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Appendix A

A.1. Glossary

Airport Movement Area Safety System (AMASS) — Surface detection technology that provides automated alerts and warnings toward potential runway incursions and other hazards. The system prompts controllers both visually and aurally to respond to events on the airfield which may potentially compromise safety.

Airport Moving Map Display (AMMD) — Display that denotes the own-ship position symbol and is designed to assist flight crews in orienting themselves on the airport surface to improve pilot positional awareness during taxi operations. The AMMD function is not intended to be used as the basis for ground maneuvering. Nonetheless, the application is limited exclusively to ground operations. The AMMD feature is incorporated into the Electronic Flight Bag (EFB)

Airport Surface Detection Equipment, Model X (ASDE-X) — Surface detection technology that integrates data from various sources including radars and aircraft transponders to provide controllers a more robust view of airport operations.

Class-2 System — Portable electronic device that derives its power and data directly from aircraft systems. The system is mounted in the cockpit and available for the pilot to use during all phases of flight.

Commercial Aviation Operations — Scheduled or charter for-hire aircraft used to carry passengers or cargo. These aircraft are typically operated by airlines, air cargo, and charter services. This group of aircraft operations includes jet transports and commuter aircraft.

Crew Resource Management (CRM) — The use of all available resources, information, equipment, and people to achieve safe and efficient flight operations.

Federal Aviation Administration (FAA) Operational Evolution Partnership (OEP) — This partnership is lead by the FAA and requires collaboration, commitment, monitoring, and accountability among internal and external stakeholders to transition the National Airspace System to NextGen. In particular, the OEP serves as the integration and implementation mechanism for NextGen.

General Aviation (GA) — General Aviation operations encompass the full range of activity from student pilots to multi-hour, multi-rated pilots flying sophisticated aircraft for business or pleasure. This group of aircraft operations includes small general aviation aircraft (less than 12,500 lbs maximum takeoff weight) and large general aviation aircraft (maximum takeoff weight greater than or equal to 12,500 lbs). The small general aviation aircraft tend to be single-piloted aircraft, such as a Cessna 152 or Piper Cherokee. The large general aviation aircraft tend to be represented by corporate or executive aircraft with a two-person flight crew — for example a Cessna Citation C550 or Gulfstream V.

Hold Short — An air traffic control instruction to the pilot of an aircraft to not proceed beyond a designated point such as a specified runway or taxiway.

ICAO Hot Spot — A location on an aerodrome movement area with a history or potential risk of collision or runway incursion, where pilot/vehicle operator heightened attention is necessary.

Military Operations — Any aircraft operated by the United States military.

Operational Deviation (OD) — An occurrence attributable to an element of the air traffic system in which applicable separation minima were maintained, but an aircraft,

vehicle, equipment, or personnel encroached upon a landing area that was delegated to another position of operation without prior coordination and approval.

Operational Error (OE) — An action by an air traffic controller that results in less than the required minimum separation between two or more aircraft, or between an aircraft and obstacle (e.g., vehicles, equipment, personnel on runways).

Pilot Deviation (PD) — An action of a pilot that violates any Federal Aviation Regulation.

Precision Approach Path Indicator (PAPI) — Lighting system that primarily assists pilots by providing visual glide slope guidance in precision approach environments. The glide path is comprised of a maximum of four lights (red and white) that will illuminate in combinations (e.g. two white and two red when the pilot is on the correct glide slope or one red and three white when the pilot is slight above the glide slope) to assist the pilot in adjusting the approach accordingly.

Runway Entrance Lights (REL) — Lighting system located at runway-taxiway intersections that illuminates a string of red lights and serves as an indicator for pilots and vehicle operators when it is unsafe to enter or cross the runway.

Runway Incursion (RI) — Any occurrence on the airport runway environment involving an aircraft, vehicle, person, or object on the ground that creates a collision hazard or results in a loss of required separation with an aircraft taking off, intending to take off, landing, or intending to land.

Runway Incursion Error Type — Operational error/deviation, pilot deviation, or vehicle/pedestrian deviation.

Runway Status Lights (RWSL) — Warning system located on the runway that provides a visual indication to pilots and ground vehicle operators not to enter or cross a runway on which there is approaching traffic. System consists of red in-pavement runway entrance lights that are illuminated if a runway is unsafe for entry or crossing.

Surface Incident (SI) — Any event where unauthorized or unapproved movement occurs within the movement area, or an occurrence in the movement area associated with the operation of an aircraft that affects or could affect the safety of flight. A surface incident can occur anywhere on the airport's surface, including the runway. The FAA further classifies a surface incident as either a runway incursion or a non-runway incursion. In this report, non-runway incursions are generically referred to as surface incidents.

Taxi Into Position and Hold (TIPH) — An air traffic control instruction to a pilot of an aircraft to taxi onto the active departure runway, to hold in that position, and not take off until specifically cleared to do so.

Vehicle/Pedestrian Deviation (V/PD) — Vehicles or pedestrians moving on the runway movement area without authorization from air traffic control that interferes with aircraft operations.

A.2 Acronyms

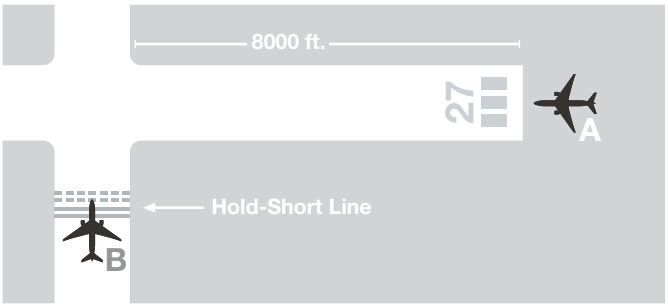
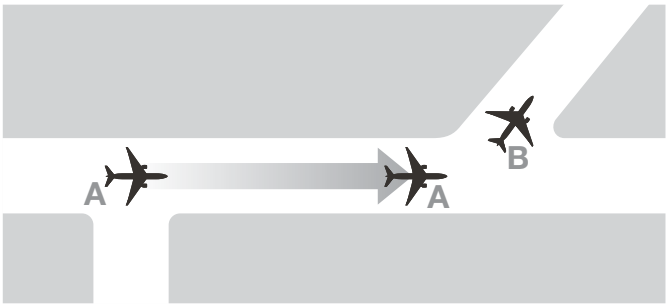
AC	Advisory Circular
AFS	Flight Standards Service
AFSS	Automated Flight Service Stations
ANC	Air Navigation Commission
AOV	Air Traffic Safety Oversight Service
ARP	Office of Airports
ATC	Air Traffic Control
ATO	Air Traffic Organization
ATO-E	Air Traffic Organization-En Route and Oceanic Services
ATO-S	Air Traffic Organization-Safety Services
ATO-T	Air Traffic Organization-Terminal Services
ATO-W	Air Traffic Organization-Technical Operations Services
AMASS	Airport Movement Area Safety System
AMS	Acquisition Management System
ASDE-X	Airport Surface Detection Equipment, Model X
ASDE-3	Airport Surface Detection Equipment-3
ASI	Aviation Safety Inspector
BASIC	(B)e sure the runway is open, (A)ircraft position verified, (S)can the runway, (I)ssue clearances using correct phraseology, and (C)lose the loop by getting an accurate readback
COO	Chief Operating Officer
CRM	Crew Resource Management
CY	Calendar Year
DMRS	Database Management Reporting System
DVD	Digital Video Disc
EFB	Electronic Flight Bag
FAA	Federal Aviation Administration
FAASTeam	Federal Aviation Administration Safety Team
FAROS	Final Approach Runway Occupancy Signal
FBO	Fixed Based Operations
FSAS	Facility Safety Assessment System
FY	Fiscal Year
GA	General Aviation
GPS	Global Positioning System
ICAO	International Civil Aviation Organization
IOT&E	Independent Operational Test and Evaluation Directorate
NAS	National Airspace System
IPT	Integrated Product Team
NOTAM	Notice To Airmen
NTSB	National Transportation Safety Board
OE/D	Operational Error or Operational Deviation
OEP	Operational Evolution Partnership

OIG	Office of the Inspector General
PANS-ATM	Procedures for Air Navigation Services-Air Traffic Management
PAPI	Precision Approach Path Indicator
PD	Pilot Deviation
REL	Runway Entrance Lights
RIIEP	Runway Incursion Information Evaluation Program
RISC	Runway Incursion Severity Categorization model
RRSPM	Regional Runway Safety Program Manager
RSAT	Runway Safety Action Team
RWSL	Runway Status Lights
SATORI	Systematic Air Traffic Operations Research Initiative
SD	Safety Directives
SMS	Safety Management System
SRM	Safety Risk Management
TARP	Terminal Analysis and Review Program
THL	Takeoff-hold Lights
TIPH	Taxi Into Position and Hold
TRACON	Terminal Radar Approach Control
US	United States
V/PD	Vehicle/Pedestrian Deviations

Appendix B

B.1 History of Runway Incursion Severity

In 2000, the FAA convened a government-industry team of aviation analysts with expertise in air traffic control, airway facilities, airports, flight standards, human factors, and system safety to conduct a systematic review and analysis of the 1,369 reported runway incursions that occurred from CY 1997 through CY 2000 and categorized these incidents in terms of severity. This analysis, presented in the June 2001 Runway Safety Report, provided the foundation for the continued analysis and classification of runway incursion severity. Since that time, the FAA Office of Runway Safety has continued to systematically review the reported runway incursions on a regular basis.

CASE 1	CASE 2
This incident meets the definition of a runway incursion, but there is little or no chance of collision.	This is a severe situation where the margin of safety is so low that a collision is barely avoided.
	
Aircraft A is on approach to Runway 27, an 8,000-foot runway. Aircraft B is taxiing to a parking area on the north side of the airport and has been instructed by air traffic control to "hold short of Runway 27" in anticipation of the arrival of Aircraft A. When Aircraft A is on a quarter mile final approach, Aircraft B's pilot informs the controller that he has accidentally crossed the hold-short line for Runway 27. Although he is not on the runway, the aircraft's nose is across the hold-short line, usually 175 feet from the runway. A runway incursion has occurred since separation rules require that a runway be clear of any obstacle before an aircraft can land or take off on that runway. The controller instructs Aircraft A to "go around." ■ The potential for a collision is low, but by definition, a runway incursion has taken place. ■ This case exemplifies the most frequently reported runway incursions.	Aircraft A has been cleared to taxi into position and hold on Runway 9 following Aircraft B that has just landed on the same runway and is rolling out. Aircraft B is instructed to turn left at a taxiway. Aircraft B acknowledges. The controller observes Aircraft B exiting the runway and clears Aircraft A for takeoff. A moment later the controller notices too late that Aircraft B has not fully cleared the runway and in fact appears to have come to a complete stop with much of the aircraft still on the runway. Aircraft A has accelerated to the point it cannot stop and has only the option to fly over the top of Aircraft B. ■ The potential for a collision is high and typifies the common perception of a runway incursion. ■ This case is more severe but occurs infrequently.

These examples demonstrate why more descriptive runway incursion categorizations were necessary to capture the different margins of safety—or, conversely, varying degrees of severity—associated with each runway incursion. An accurate portrayal of runway incursion severity trends is essential to finding solutions that target opportunities for error and mitigate the consequences of those errors that do happen.

B.2 Factors Considered in Severity Categorization

- Speed and performance of the aircraft
- Distance between parties (horizontal and/or vertical)
- Location of aircraft, vehicle, or object on the actual runway or on a taxiway inside the runway holding position markings
- Type and extent of evasive action
- Was the party on the ground stopped or moving?
- Knowledge of the other party's location
- Visibility conditions
- Night vs. day
- Runway conditions (e.g., wet, snow covered)
- Status of radio communications

B.3 Runway Collisions

Data for the four Runway Collisions (FY2003 through FY 2006)

Date	Airport	Airport Location	Brief Summary
05/10/2003	EWR	Newark Intl, NJ	A jet transport was cleared for takeoff on a NOTAMED closed runway with men and equipment on the runway. There were orange plastic cones 2 to 3 feet in height being used as a barrier and the jet hit 3 cones on departures. No aircraft damage was reported.
08/01/2003	OSH	Wittman Regional Oshkosh, WI	An experimental general aviation aircraft was cleared to land. Due to the Experimental Aircraft Association (EAA) convention, a waiver had been issued to reduce runway separation allowing more than one aircraft to land on the runway. Another general aviation aircraft, on a ¾ mile final, was also cleared to land on the same runway following the experimental aircraft. After landing, the general aviation aircraft locked his brakes and struck the experimental as it was exiting the runway on the left side of the runway into the grass. No fatalities.
09/23/2003	VGT	North Las Vegas Airport, NV	A general aviation aircraft was cleared to land and, one minute later, local control cleared another general aviation aircraft for takeoff from an intersecting runway. The planes collided at the intersection of the runways. No fatalities.
11/30/2004	PHL	Philadelphia Intl Airport, PA	Ground Control approved a maintenance tug towing a jet transport to cross Runway 35. Simultaneously, Local Control cleared a general aviation aircraft for take-off, also on Runway 35. While on departure roll, the aircraft observed the tug and veered left to avoid a collision, clipping his right wing tip on the tug. This collision resulted in damage but no injuries.

Appendix C

C.1 OEP-35 Airports

Airport Code	Airport Name, City	Pacing[1]
ATL	Hartsfield-Jackson Atlanta International Airport, Atlanta	x
BOS	General Edward Logan International Airport, Boston	
BWI	Baltimore/Washington International Thurgood Marshall Airport, Baltimore	x
CLE	Cleveland-Hopkins International Airport, Cleveland	
CLT	Charlotte/Douglas International Airport, Charlotte	
CVG	Cincinnati/Northern Kentucky International Airport, Cincinnati	x
DCA	Ronald Reagan Washington National Airport, Washington, DC	
DEN	Denver International Airport, Denver	
DFW	Dallas/Ft. Worth International Airport, Dallas-Ft. Worth	
DTW	Detroit Metropolitan Wayne County Airport, Detroit	
EWR	Newark Liberty International Airport, Newark	
FLL	Ft. Lauderdale/Hollywood International Airport, Ft. Lauderdale	
HNL	Honolulu International Airport, Honolulu	
IAD	Washington Dulles International Airport, Dulles	
IAH	George Bush Intercontinental/Houston Airport, Houston	
JFK	John F. Kennedy International Airport, New York	
LAS	McCarran International Airport, Las Vegas	
LAX	Los Angeles International Airport, Los Angeles	
LGA	LaGuardia Airport, New York	
MCO	Orlando International Airport, Orlando	
MDW	Chicago Midway International Airport, Chicago	
MEM	Memphis International Airport, Memphis	x
MIA	Miami International Airport, Miami	x
MSP	Minneapolis-St Paul International/Wold-Chamberlain Airport, Minneapolis	x
ORD	Chicago O'Hare International Airport, Chicago	
PDX	Portland International Airport, Portland	x
PHL	Philadelphia International Airport, Philadelphia	
PHX	Phoenix Sky Harbor International Airport, Phoenix	
PIT	Pittsburgh International Airport, Pittsburgh	
SAN	San Diego International Airport, San Diego	
SEA	Seattle-Tacoma International Airport, Seattle	
SFO	San Francisco International Airport, San Francisco	x
SLC	Salt Lake City International Airport, Salt Lake City	
STL	Lambert-St. Louis International Airport, St. Louis	
TPA	Tampa International Airport, Tampa	

[1]Airports with the highest delay rates in the US are designated "pacing" airport.
FAA Operational Evolution Plan V 7.1.

C.2 GA-35 Airports

Airport Code	Airport Name, City
APA	Centennial Airport, Denver
BFI	Boeing Field/King County International Airport, Seattle
BJC	Rocky Mountain Metropolitan/Jefferson County Airport, Broomfield
CHD	Chandler Municipal Airport, Chandler
CRQ	McClellan-Palomar Airport, Carlsbad
DAB	Daytona Beach International Airport, Daytona Beach
DVT	Phoenix Deer Valley Airport, Phoenix
DWH	David Wayne Hooks Memorial Airport, Houston
FFZ	Falcon Field Airport, Mesa
FRG	Republic Airport, Farmingdale
FXE	Ft. Lauderdale Executive Airport, Ft. Lauderdale
GFK	Grand Forks International Airport, Grand Forks
HIO	Portland-Hillsboro Airport, Hillsboro
IWA	Williams Gateway Airport, Phoenix
LGB	Long Beach Airport-Daugherty Field, Long Beach
LVK	Livermore Municipal Airport, Livermore
MMU	Morristown Municipal Airport, Morristown
MRI	Merrill Field Airport, Anchorage
MYF	Montgomery Field Airport, San Diego
PAO	Palo Alto Airport of Santa Clara County, Palo Alto
PDK	Dekalb-Peachtree Airport, Atlanta
PIE	St. Petersburg-Clearwater International Airport, St. Petersburg
POC	Brackett Field Airport, La Verne
PRC	Ernest A. Love Field Airport, Prescott
PTK	Oakland County International Airport, Pontiac
RHV	Reid-Hillview Airport of Santa Clara County, San Jose
RVS	Richard Lloyd Jones Jr. Airport, Tulsa
SDL	Scottsdale Airport, Scottsdale
SEE	Gillespie Field, San Diego/El Cajon
SFB	Orlando-Sanford International Airport, Orlando
SNA	John Wayne-Orange County Airport, Santa Ana
TIX	Space Coast Regional Airport, Titusville
TMB	Kendall-Tamiami Executive Airport, Miami
VGT	North Las Vegas Airport, Las Vegas
VNY	Van Nuys Airport, Van Nuys

C.3 Airports that have Received or are Slated to Receive AMASS or ASDE-X Systems

Airport Code	Airport Name, City	AMASS	ASDE-X
ADW	Andrews AFB, Camp Springs	x	
ANC	Ted Stevens Anchorage International Airport, Anchorage	x	
ATL	Hartsfield-Jackson Atlanta International Airport, Atlanta	x	x
BDL	Bradley International Airport, Windsor Locks		x
BOS	General Edward Logan International Airport, Boston	x	x
BWI	Baltimore/Washington International Thurgood Marshall Airport, Baltimore	x	x
CLE	Cleveland-Hopkins International Airport, Cleveland	x	
CLT	Charlotte/Douglas International Airport, Charlotte	x	x
CVG	Cincinnati/Northern Kentucky International Airport, Cincinnati	x	
DCA	Ronald Reagan Washington National Airport, Washington, DC		x
DEN	Denver International Airport, Denver	x	x
DFW	Dallas/Ft. Worth International Airport, Dallas-Ft. Worth	x	x
DTW	Detroit Metropolitan Wayne County Airport, Detroit	x	x
EWR	Newark Liberty International Airport, Newark	x	x
FLL	Ft. Lauderdale/Hollywood Airport, Ft. Lauderdale		x
HNL	Honolulu International Airport, Honolulu		x
HOU	William P. Hobby Airport, Houston		x
IAD	Washington Dulles International Airport, Dulles	x	x
IAH	George Bush Intercontinental/Houston Airport, Houston	x	x
JFK	John F. Kennedy International Airport, New York	x	x
LAS	McCarran International Airport, Las Vegas	x	x
LAX	Los Angeles International Airport, Los Angeles	x	x
LGA	LaGuardia Airport, New York	x	x
MCI	Kansas City International Airport, Kansas City	x	
MCO	Orlando International Airport, Orlando		x
MDW	Chicago Midway International Airport, Chicago		x
MEM	Memphis International Airport, Memphis	x	x
MIA	Miami International Airport, Miami	x	x
MKE	General Mitchell International Airport, Milwaukee		x
MSP	Minneapolis-St. Paul International/ Wold-Chamberlain Airport, Minneapolis	x	x

Airport Code	Airport Name, City	AMASS	ASDE-X
MSY	Louis Armstrong New Orleans International Airport, New Orleans	x	
ORD	Chicago O'Hare International Airport, Chicago	x	x
PDX	Portland International Airport, Portland	x	
PHL	Philadelphia International Airport, Philadelphia	x	x
PHX	Phoenix Sky Harbor International Airport, Phoenix		x
PIT	Pittsburgh International Airport, Pittsburgh	x	
PVD	Theodore Francis Green State Airport, Providence		x
SAN	San Diego International Airport, San Diego	x	x
SDF	Louisville International Airport-Standiford Field, Louisville	x	x
SEA	Seattle-Tacoma International Airport, Seattle	x	x
SFO	San Francisco International Airport, San Francisco	x	
SLC	Salt Lake City International Airport, Salt Lake City	x	x
SNA	John Wayne-Orange County Airport, Santa Ana		x
STL	Lambert-St. Louis International Airport, St. Louis	x	x

C.4 Runway Incursion Types at OEP-35 and GA-35 Airports

C.4.1 Operational Errors/ Deviations

National Operational Errors/Deviations

	FY 2003	FY 2004	FY 2005	FY 2006	Total
Category D	42	38	52	52	184
Category C	38	48	37	27	150
Category B	5	6	7	2	20
Category A	4	5	9	8	26
National Total	**89**	**97**	**105**	**89**	**380**

OEP-35 Airports Operational Errors/Deviations

	FY 2003	FY 2004	FY 2005	FY 2006	Total
Category D	20	21	26	26	93
Category C	19	18	15	17	69
Category B	2	1	3	0	6
Category A	1	1	4	3	9
OEP 35 Airports Total	**42**	**41**	**48**	**46**	**177**

GA-35 Airports Operational Errors/Deviations

	FY 2003	FY 2004	FY 2005	FY 2006	Total
Category D	3	5	10	4	22
Category C	6	4	8	3	21
Category B	0	3	1	0	4
Category A	1	0	4	0	5
GA 35 Airports Total	**10**	**12**	**23**	**7**	**52**

C.4.2 Pilot Deviations

National Pilot Deviations

	FY 2003	FY 2004	FY 2005	FY 2006	Total
Category D	99	104	113	133	449
Category C	61	55	47	39	202
Category B	11	8	5	5	29
Category A	3	6	4	13	26
National Total	**174**	**173**	**169**	**190**	**706**

OEP-35 Airports Pilot Deviations

	FY 2003	FY 2004	FY 2005	FY 2006	Total
Category D	23	25	34	27	109
Category C	16	18	8	8	50
Category B	2	0	1	3	6
Category A	0	1	1	2	4
OEP 35 Airports Total	**41**	**44**	**44**	**40**	**169**

GA-35 Airports Pilot Deviations

	FY 2003	FY 2004	FY 2005	FY 2006	Total
Category D	19	16	30	26	91
Category C	11	13	11	9	44
Category B	5	2	1	0	8
Category A	0	2	1	4	7
GA 35 Airports Total	**35**	**33**	**43**	**39**	**150**

C.4.3 Vehicle/Pedestrian Deviations

National Vehicle/Pedestrian Deviations

	FY 2003	FY 2004	FY 2005	FY 2006	Total
Category D	40	36	38	39	153
Category C	11	17	11	9	48
Category B	6	2	3	0	11
Category A	3	1	1	3	8
National Total	**60**	**56**	**53**	**51**	**220**

OEP-35 Airports Vehicle/Pedestrian Deviations

	FY 2003	FY 2004	FY 2005	FY 2006	Total
Category D	13	12	12	14	51
Category C	3	6	5	5	19
Category B	1	0	0	0	1
Category A	1	0	1	2	4
OEP 35 Airports Total	**18**	**18**	**18**	**21**	**75**

GA-35 Airports Vehicle/Pedestrian Deviations

	FY 2003	FY 2004	FY 2005	FY 2006	Total
Category D	3	8	11	4	26
Category C	1	4	1	0	6
Category B	1	0	3	0	4
Category A	0	0	0	0	0
GA 35 Airports Total	**5**	**12**	**15**	**4**	**36**

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Appendix D

ALABAMA

Airport, City (Airport Code)	Region	Fiscal year	Severity					Total RIs	Annual RI Rate	Total SIs
			Collision	A	B	C	D			
Birmingham International Airport, Birmingham (BHM)	ASO	2003					1	1	0.65	10
		2004								6
		2005					1	1	0.67	1
		2006				1	1	2	1.40	3
Huntsville International - Carl T. Jones Airport, Huntsville (HSV)	ASO	2003					1	1	1.04	2
		2004								2
		2005								1
		2006								2
Mobile Downtown Airport, Mobile (BFM)	ASO	2003								
		2004								
		2005								
		2006								2
Mobile Regional Airport, Mobile (MOB)	ASO	2003								
		2004								
		2005								
		2006					1	1	0.94	4
Montgomery Regional Airport, Montgomery (MGM)	ASO	2003								1
		2004								1
		2005					1	1	1.50	
		2006								1

ALASKA

Airport, City (Airport Code)	Region	Fiscal year	Severity					Total RIs	Annual RI Rate	Total SIs
			Collision	A	B	C	D			
Bethel Airport, Bethel (BET)	AAL	2003				1	1	2	1.77	
		2004					3	3	2.80	1
		2005				1		1	0.97	2
		2006					1	1	1.00	1
Fairbanks International Airport, Fairbanks (FAI)	AAL	2003					3	3	2.16	7
		2004				1	2	3	2.40	4
		2005				2	2	4	3.52	9
		2006					2	2	1.78	7
Fort Yukon Airport, Fort Yukon (FYU)	AAL	2003								
		2004								1
		2005								
		2006								
Juneau International Airport, Juneau (JNU)	AAL	2003					1	1	0.78	1
		2004								1
		2005					1	1	0.97	
		2006								

ALASKA – Continued

Airport, City (Airport Code)	Region	Fiscal year	Severity					Total RIs	Annual RI Rate	Total SIs
			Collision	A	B	C	D			
Kodiak Airport, Kodiak (ADQ)	AAL	2003					1	1	3.03	
		2004					2	2	6.07	2
		2005								2
		2006								
Merrill Field Airport, Anchorage (MRI)	AAL	2003					1	1	0.49	10
		2004				1	4	5	2.58	22
		2005				1	1	2	1.06	9
		2006								10
Ted Stevens Anchorage International Airport, Anchorage (ANC)[1]	AAL	2003				1	3	4	1.35	7
		2004				3	3	6	1.96	7
		2005				2	5	7	2.23	9
		2006					3	3	0.98	14

[1] Includes Lake Hood (LHD) data.

ARIZONA

Airport, City (Airport Code)	Region	Fiscal year	Severity					Total RIs	Annual RI Rate	Total SIs
			Collision	A	B	C	D			
Chandler Municipal Airport, Chandler (CHD)	AWP	2003								2
		2004								1
		2005					1	1	0.44	1
		2006				1		1	0.37	
Ernest A. Love Field Airport, Prescott (PRC)	AWP	2003					4	4	1.22	2
		2004								1
		2005					4	4	1.69	4
		2006					1	1	0.44	3
Falcon Field Airport, Mesa (FFZ)	AWP	2003					1	1	0.35	4
		2004								2
		2005					2	2	0.78	4
		2006								2
Flagstaff Pulliam Airport, Flagstaff (FLG)	AWP	2003								
		2004								
		2005								
		2006								1
Glendale Municipal Airport, Glendale (GEU)	AWP	2003								
		2004								1
		2005			1			1	0.78	
		2006								
Laughlin/Bullhead International Airport, Bullhead City (IFP)	AWP	2003								1
		2004								7
		2005					1	1	3.52	7
		2006								2

ARIZONA – Continued

Airport, City (Airport Code)	Region	Fiscal year	Severity					Total RIs	Annual RI Rate	Total SIs
			Collision	A	B	C	D			
Phoenix Deer Valley Airport, Phoenix (DVT)	AWP	2003				2		2	0.52	3
		2004				1	1	2	0.56	1
		2005		1		3	1	5	1.40	8
		2006		1			1	2	0.50	2
Phoenix Goodyear Airport, Goodyear (GYR)	AWP	2003				1		1	0.75	3
		2004								
		2005					1	1	1.04	
		2006					1	1	0.72	1
Phoenix Sky Harbor International Airport, Phoenix (PHX)	AWP	2003					2	2	0.34	2
		2004				4	1	5	0.84	7
		2005				2	2	4	0.71	2
		2006		2		1		3	0.54	1
Ryan Airfield, Tucson (RYN)	AWP	2003								
		2004					1	1	0.65	
		2005								
		2006								
Scottsdale Airport, Scottsdale (SDL)	AWP	2003								1
		2004					1	1	0.50	1
		2005		1		2	2	5	2.36	1
		2006					1	1	0.50	2
Tucson International Airport, Tucson (TUS)	AWP	2003								1
		2004				1		1	0.41	2
		2005								4
		2006		1		1	2	4	1.42	1
Williams Gateway Airport, Phoenix (IWA)	AWP	2003					1	1	0.56	3
		2004				1		1	0.43	2
		2005				1	1	2	0.77	1
		2006				1	4	5	1.82	2

ARKANSAS

Airport, City (Airport Code)	Region	Fiscal year	Severity					Total RIs	Annual RI Rate	Total SIs
			Collision	A	B	C	D			
Adams Field, Little Rock (LIT)	ASW	2003					1	1	0.57	3
		2004				1	1	2	1.08	2
		2005								1
		2006					1	1	0.69	4
Drake Field, Fayetteville (FYV)	ASW	2003								
		2004								
		2005								1
		2006								

ARKANSAS – Continued

Airport, City (Airport Code)	Region	Fiscal year	Severity					Total RIs	Annual RI Rate	Total SIs
			Collision	A	B	C	D			
Ft. Smith Regional Airport, Ft. Smith (FSM)	ASW	2003								
		2004								1
		2005								
		2006								
Springdale Municipal Airport, Springdale (ASG)	ASW	2003								
		2004					1	1	1.67	
		2005								
		2006								

CALIFORNIA

Airport, City (Airport Code)	Region	Fiscal year	Severity					Total RIs	Annual RI Rate	Total SIs
			Collision	A	B	C	D			
Brackett Field Airport, La Verne (POC)	AWP	2003								3
		2004								2
		2005				1	1	2	1.17	1
		2006					1	1	0.79	5
Brown Field Municipal, San Diego (SDM)	AWP	2003								1
		2004								1
		2005								1
		2006								
Buchanan Field, Concord (CCR)	AWP	2003				1	6	7	5.61	3
		2004		1			4	5	4.03	1
		2005				1	1	2	1.62	2
		2006								1
Bob Hope Airport, Burbank (BUR)	AWP	2003				1	1	2	1.14	1
		2004								1
		2005								3
		2006					2	2	1.04	5
Camarillo Airport, Camarillo (CMA)	AWP	2003					1	1	0.51	12
		2004			1		3	4	2.37	4
		2005					1	1	0.65	7
		2006					2	2	1.33	11
Chico Municipal Airport, Chico (CIC)	AWP	2003								
		2004								
		2005								1
		2006					1	1	2.20	
Chino Airport, Chino (CNO)	AWP	2003					5	5	3.22	3
		2004					3	3	1.90	4
		2005								2
		2006								10

CALIFORNIA – Continued

Airport, City (Airport Code)	Region	Fiscal year	Severity					Total RIs	Annual RI Rate	Total SIs
			Collision	A	B	C	D			
El Monte Airport, El Monte (EMT)	AWP	2003								1
		2004								
		2005								2
		2006								1
Fresno Yosemite International Airport, Fresno (FAT)	AWP	2003								
		2004					1	1	0.61	2
		2005								
		2006					1	1	0.65	
Gillespie Field, San Diego/El Cajon (SEE)	AWP	2003								5
		2004			1		1	2	1.01	6
		2005			1	1	2	4	1.75	1
		2006		1				1	0.36	3
Hawthorne Municipal Airport, Hawthorne (HHR)	AWP	2003								
		2004								
		2005								
		2006					1	1	1.61	3
Hayward Executive Airport, Hayward (HWD)	AWP	2003								
		2004								
		2005								
		2006								1
John Wayne Airport-Orange County, Santa Ana (SNA)	AWP	2003					1	1	0.28	3
		2004				2	2	4	1.10	4
		2005				3	5	8	2.13	3
		2006					3	3	0.83	1
Lake Tahoe Airport, South Lake Tahoe (TVL)	AWP	2003								
		2004								1
		2005								
		2006								
Livermore Municipal Airport, Livermore (LVK)	AWP	2003								
		2004								
		2005								
		2006								1
Long Beach Airport - Daugherty Field, Long Beach (LGB)	AWP	2003			1	1	4	6	1.77	7
		2004				1	4	5	1.45	8
		2005					6	6	1.71	10
		2006				1	1	2	0.56	6
Los Angeles International Airport, Los Angeles (LAX)	AWP	2003				1	8	9	1.43	7
		2004			1	2	4	7	1.08	4
		2005				2	6	8	1.22	12
		2006		1	1		6	8	1.22	3

CALIFORNIA – Continued

Airport, City (Airport Code)	Region	Fiscal year	Severity					Total RIs	Annual RI Rate	Total SIs
			Collision	A	B	C	D			
McClellan-Palomar Airport, Carlsbad (CRQ)	AWP	2003								
		2004				1		1	0.48	1
		2005					1	1	0.49	
		2006					3	3	1.52	
Meadows Field, Bakersfield (BFL)	AWP	2003			1		1	2	1.48	3
		2004				1		1	0.71	4
		2005								1
		2006								2
Metropolitan Oakland International Airport, Oakland (OAK)	AWP	2003								1
		2004								2
		2005								3
		2006				1	1	2	0.60	5
Modesto County Airport, Modesto (MOD)	AWP	2003								1
		2004					1	1	1.24	1
		2005								
		2006								
Monterey Peninsula Airport, Monterey (MRY)	AWP	2003								
		2004								
		2005					1	1	1.12	1
		2006					2	2	2.17	2
Montgomery Field Airport, San Diego (MYF)	AWP	2003				1		1	0.45	
		2004					2	2	0.89	1
		2005					1	1	0.41	1
		2006								2
Napa County Airport, Napa (APC)	AWP	2003					1	1	0.80	1
		2004				1	1	2	1.72	
		2005								
		2006				1	2	3	2.58	3
Norman Y. Mineta San Jose International Airport, San Jose (SJC)	AWP	2003					1	1	0.46	4
		2004			1	1		2	0.92	3
		2005								8
		2006					2	2	0.93	8
Ontario International Airport, Ontario (ONT)	AWP	2003					5	5	3.43	2
		2004				1		1	0.65	6
		2005					1	1	0.68	3
		2006					1	1	0.73	2
Oxnard Airport, Oxnard (OXR)	AWP	2003								
		2004				2		2	2.08	3
		2005								2
		2006								1

CALIFORNIA – Continued

Airport, City (Airport Code)	Region	Fiscal year	Severity					Total RIs	Annual RI Rate	Total SIs
			Collision	A	B	C	D			
Palm Springs International Airport, Palm Springs (PSP)	AWP	2003					1	1	1.05	1
		2004					3	3	3.16	1
		2005					2	2	2.11	2
		2006			1		2	3	3.28	5
Palmdale Regional Airport, Palmdale (PMD)	AWP	2003								
		2004								1
		2005								
		2006								
Palo Alto Airport of Santa Clara County, Palo Alto (PAO)	AWP	2003					1	1	0.47	
		2004								
		2005					1	1	0.54	1
		2006								
Redding Municipal Airport, Redding (RDD)	AWP	2003								
		2004			1			1	1.28	
		2005								
		2006								
Reid-Hillview Airport of Santa Clara County, San Jose (RHV)	AWP	2003								1
		2004				1		1	0.49	
		2005					1	1	0.50	1
		2006					1	1	0.59	
Riverside Municipal Airport, Riverside (RAL)	AWP	2003								
		2004								
		2005								1
		2006			1			1	1.20	
Sacramento Executive Airport, Sacramento (SAC)	AWP	2003			1		1	2	1.59	
		2004				1		1	0.74	
		2005								
		2006					1	1	0.88	2
Sacramento International Airport, Sacramento (SMF)	AWP	2003								1
		2004					1	1	0.61	1
		2005								
		2006								1
Sacramento Mather Airport, Sacramento (MHR)	AWP	2003								
		2004				1		1	1.24	1
		2005								1
		2006								1
Salinas Municipal Airport, Salinas (SNS)	AWP	2003								1
		2004				1		1	1.28	
		2005								
		2006				1		1	1.36	

CALIFORNIA – Continued

Airport, City (Airport Code)	Region	Fiscal year	Severity					Total RIs	Annual RI Rate	Total SIs
			Collision	A	B	C	D			
San Diego International Airport, San Diego (SAN)	AWP	2003				1	1	2	0.97	1
		2004					1	1	0.47	2
		2005								4
		2006								
San Francisco International Airport, San Francisco (SFO)	AWP	2003				2	1	3	0.89	
		2004				2	1	3	0.85	3
		2005								
		2006				2	1	3	0.84	5
San Luis County Regional Airport, San Luis Obispo (SBP)	AWP	2003								
		2004								
		2005								
		2006								1
Santa Barbara Municipal Airport, Santa Barbara (SBA)	AWP	2003				2	2	4	2.59	6
		2004				2	1	3	2.00	4
		2005					1	1	0.64	2
		2006					2	2	1.46	2
Santa Maria Public/Capt G. Allen Hancock Field, Santa Maria (SMX)	AWP	2003								2
		2004								
		2005								
		2006					2	2	3.12	
Santa Monica Municipal Airport, Santa Monica (SMO)	AWP	2003								2
		2004					1	1	0.74	2
		2005								3
		2006								6
Sonoma County Airport, Santa Rosa (STS)	AWP	2003				1		1	0.85	
		2004								1
		2005								2
		2006								1
Vandenberg Air Force Base, Lompoc (VBG)	AWP	2003								
		2004								1
		2005								
		2006								
Van Nuys Airport, Van Nuys (VNY)	AWP	2003								2
		2004					1	1	0.22	5
		2005			1		2	3	0.71	6
		2006				1	1	2	0.51	1
Victorville/Southern California Logistics Airport, Victorville (VCV)	AWP	2003								
		2004								
		2005								
		2006								3

CALIFORNIA – Continued

Airport, City (Airport Code)	Region	Fiscal year	Severity					Total RIs	Annual RI Rate	Total SIs
			Collision	A	B	C	D			
Whiteman Airport, Los Angeles (WHP)	AWP	2003								
		2004								1
		2005								
		2006								1
Yuba County Airport, Marysville (MYV)	AWP	2003								
		2004								
		2005								
		2006								1
Zamperini Field, Torrance (TOA)	AWP	2003								
		2004								
		2005								1
		2006					1	1	0.67	

COLORADO

Airport, City (Airport Code)	Region	Fiscal year	Severity					Total RIs	Annual RI Rate	Total SIs
			Collision	A	B	C	D			
Centennial Airport, Denver (APA)	ANM	2003				2	3	5	1.34	1
		2004				2	2	4	1.13	5
		2005				2		2	0.56	6
		2006				1		1	0.31	4
Colorado Springs Municipal Airport, Colorado Springs (COS)	ANM	2003								
		2004		1				1	0.55	
		2005								
		2006					1	1	0.67	
Denver International Airport, Denver (DEN)	ANM	2003				1		1	0.20	
		2004				1		1	0.18	1
		2005								1
		2006								1
Eagle County Regional Airport, Eagle (EGE)	ANM	2003								1
		2004								
		2005		1				1	2.44	1
		2006								
Front Range Airport, Aurora (FTG)	ANM	2003								
		2004								
		2005								
		2006		1				1	1.13	
Pueblo Memorial Airport, Pueblo (PUB)	ANM	2003								
		2004				1		1	1.09	
		2005								2
		2006								1

COLORADO – Continued

Airport, City (Airport Code)	Region	Fiscal year	Severity: Collision	A	B	C	D	Total RIs	Annual RI Rate	Total SIs
Rocky Mountain Metropolitan/Jefferson County Airport, Broomfield (BJC)	ANM	2003			1		1	2	1.18	4
		2004			1	2	1	4	2.14	8
		2005								3
		2006								1
Sardy Field, Aspen (ASE)	ANM	2003				1	1	2	4.57	
		2004								
		2005				1	1	2	4.47	2
		2006					1	1	2.25	1
Walker Field, Grand Junction (GJT)	ANM	2003								
		2004					1	1	1.14	
		2005								
		2006					1	1	1.35	

CONNECTICUT

Airport, City (Airport Code)	Region	Fiscal year	Severity: Collision	A	B	C	D	Total RIs	Annual RI Rate	Total SIs
Bradley International Airport, Windsor Locks (BDL)	ANE	2003								4
		2004								2
		2005				1	2	3	1.91	3
		2006					2	2	1.33	1
Groton-New London Airport, Groton (GON)	ANE	2003								1
		2004								
		2005								
		2006								
Hartford-Brainard Airport, Hartford (HFD)	ANE	2003								
		2004					1	1	1.02	
		2005								
		2006								1
Sikorsky Memorial Airport, Bridgeport (BDR)	ANE	2003								1
		2004								
		2005								
		2006								
Tweed-New Haven Airport, New Haven (HVN)	ANE	2003								
		2004								
		2005								1
		2006								
Waterbury-Oxford Airport, Oxford (OXC)	ANE	2003								
		2004								1
		2005								1
		2006								1

DELAWARE

Airport, City (Airport Code)	Region	Fiscal year	Severity					Total RIs	Annual RI Rate	Total SIs
			Collision	A	B	C	D			
New Castle County Airport, Wilmington (ILG)	AEA	2003					1	1	0.84	1
		2004				1		1	0.85	
		2005								
		2006								

DISTRICT OF COLUMBIA

Airport, City (Airport Code)	Region	Fiscal year	Severity					Total RIs	Annual RI Rate	Total SIs
			Collision	A	B	C	D			
Ronald Reagan Washington National Airport, Washington, DC (DCA)	AEA	2003								
		2004								
		2005								
		2006				1	1	2	0.72	3

FLORIDA

Airport, City (Airport Code)	Region	Fiscal year	Severity					Total RIs	Annual RI Rate	Total SIs
			Collision	A	B	C	D			
Boca Raton Airport, Boca Raton (BCT)	ASO	2003				1		1	1.11	
		2004								
		2005								
		2006								
Cecil Field, Jacksonville(VQQ)	ASO	2003		1			1	2	2.41	1
		2004								
		2005								1
		2006								
Craig Municipal Airport, Jacksonville (CRG)	ASO	2003								
		2004								1
		2005								
		2006								
Daytona Beach International Airport, Daytona Beach (DAB)	ASO	2003				1	1	2	0.59	1
		2004			1			1	0.32	3
		2005								1
		2006		1			1	2	0.78	1
Ft. Lauderdale Executive Airport, Ft. Lauderdale (FXE)	ASO	2003			1	2	3	6	2.63	14
		2004				1	2	3	1.41	6
		2005				1	1	2	0.96	2
		2006					3	3	1.54	18
Ft. Lauderdale/Hollywood International Airport, Ft. Lauderdale (FLL)	ASO	2003			1	1	1	3	1.06	1
		2004					3	3	0.97	1
		2005					2	2	0.60	7
		2006					2	2	0.67	7

FLORIDA - Continued

Airport, City (Airport Code)	Region	Fiscal year	Severity					Total RIs	Annual RI Rate	Total SIs
			Collision	A	B	C	D			
Jacksonville International Airport, Jacksonville (JAX)	ASO	2003								
		2004					1	1	0.82	1
		2005								2
		2006								
Kendall-Tamiami Executive Airport, Miami (TMB)	ASO	2003					1	1	0.55	2
		2004					1	1	0.56	3
		2005								2
		2006				1	1	2	1.02	4
Kissimmee Gateway Airport, Orlando (ISM)	ASO	2003								1
		2004								
		2005				1		1	0.66	4
		2006					1	1	0.67	3
Lakeland Linder Regional Airport, Lakeland (LAL)	ASO	2003			1	1		2	1.46	1
		2004								
		2005								
		2006								
Miami International Airport, Miami (MIA)	ASO	2003			1		1	2	0.47	1
		2004				3	3	6	1.51	3
		2005				1		1	0.26	1
		2006		1		1	2	4	1.04	1
Naples Municipal Airport, Naples (APF)	ASO	2003								
		2004								3
		2005								
		2006								
North Perry Airport, Hollywood (HWO)	ASO	2003								
		2004					1	1	0.71	1
		2005								
		2006								
Opa Locka Airport, Miami (OPF)	ASO	2003								1
		2004								
		2005								1
		2006								
Orlando Executive Airport, Orlando (ORL)	ASO	2003		1				1	0.60	1
		2004				1		1	0.63	
		2005				1		1	0.64	2
		2006		1			1	2	1.22	3
Orlando International Airport, Orlando (MCO)	ASO	2003								1
		2004								1
		2005				1		1	0.28	2
		2006					1	1	0.28	

FLORIDA - Continued

Airport, City (Airport Code)	Region	Fiscal year	Severity					Total RIs	Annual RI Rate	Total SIs
			Collision	A	B	C	D			
Orlando-Sanford International Airport, Orlando (SFB)	ASO	2003								
		2004				2	3	5	1.38	3
		2005				1	1	2	0.58	3
		2006					2	2	0.64	3
Ormond Beach Municipal Airport, Ormond Beach (OMN)	ASO	2003								
		2004								
		2005								1
		2006								
Page Field, Ft. Myers (FMY)	ASO	2003								
		2004								
		2005								1
		2006								1
Palm Beach International Airport, West Palm Beach, (PBI)	ASO	2003				1		1	0.51	2
		2004			1	2	1	4	2.02	4
		2005					1	1	0.50	11
		2006				2	1	3	1.55	12
Panama City-Bay County International Airport, Panama City (PFN)	ASO	2003								
		2004								1
		2005								
		2006								
Pensacola Regional Airport, Pensacola (PNS)	ASO	2003								1
		2004								2
		2005								
		2006					1	1	0.87	1
Sarasota-Bradenton International Airport, Sarasota (SRQ)	ASO	2003			1			1	0.73	
		2004								1
		2005								
		2006					1	1	0.61	
Southwest Florida International Airport, Ft. Myers, (RSW)	ASO	2003								
		2004								
		2005								1
		2006		1				1	1.08	1
Space Coast Regional Airport, Titusville (TIX)	ASO	2003								
		2004								1
		2005								1
		2006								1
St. Augustine Airport, St. Augustine (SGJ)	ASO	2003								2
		2004								3
		2005								
		2006				1		1	0.87	1

FLORIDA - Continued

Airport, City (Airport Code)	Region	Fiscal year	Severity					Total RIs	Annual RI Rate	Total SIs
			Collision	A	B	C	D			
St. Lucie County International Airport, Ft. Pierce (FPR)	ASO	2003				1		1	0.54	2
		2004								
		2005								2
		2006								1
St. Petersburg-Clearwater International Airport, St. Petersburg (PIE)	ASO	2003								
		2004								
		2005								1
		2006								1
Tallahassee Regional Airport, Tallahassee (TLH)	ASO	2003								1
		2004								3
		2005								3
		2006		1				1	0.99	
Tampa International Airport, Tampa (TPA)	ASO	2003					1	1	0.43	2
		2004								2
		2005					1	1	0.37	5
		2006			1			1	0.39	5
Vero Beach Municipal Airport, Vero Beach (VRB)	ASO	2003				1	2	3	1.63	1
		2004								2
		2005			1	1		2	1.36	2
		2006								

GEORGIA

Airport, City (Airport Code)	Region	Fiscal year	Severity					Total RIs	Annual RI Rate	Total SIs
			Collision	A	B	C	D			
Cobb County-McCollum Field, Marietta (RYY)	ASO	2003								
		2004								
		2005								1
		2006								
Columbus Metropolitan Airport, Columbus (CSG)	ASO	2003								
		2004								
		2005								
		2006								1
Dekalb-Peachtree Airport, Atlanta (PDK)	ASO	2003			1	1		2	0.91	3
		2004				3	1	4	1.82	2
		2005			2	2	4	8	4.04	9
		2006				1	3	4	1.94	3
Fulton County Airport, Atlanta (FTY)	ASO	2003								1
		2004								
		2005					1	1	0.85	1
		2006								1

GEORGIA - Continued

Airport, City (Airport Code)	Region	Fiscal year	Severity					Total RIs	Annual RI Rate	Total SIs
			Collision	A	B	C	D			
Gwinnett County-Briscoe Field, Lawrenceville (LZU)	ASO	2003								
		2004								1
		2005								
		2006								
Hartsfield-Jackson Atlanta International Airport, Atlanta (ATL)	ASO	2003		1		3	2	6	0.67	1
		2004		1		2	4	7	0.73	4
		2005				1	2	3	0.30	1
		2006				2	7	9	0.93	3
Middle Georgia Regional Airport, Macon (MCN)	ASO	2003								
		2004								1
		2005								2
		2006								
Savannah/Hilton Head International Airport, Savannah (SAV)	ASO	2003								
		2004								2
		2005				1	1	2	1.88	6
		2006								
Southwest Georgia Regional Airport, Albany (ABY)	ASO	2003								2
		2004								
		2005								
		2006								

HAWAII

Airport, City (Airport Code)	Region	Fiscal year	Severity					Total RIs	Annual RI Rate	Total SIs
			Collision	A	B	C	D			
Hilo International Airport, Hilo (ITO)	AWP	2003								
		2004								
		2005								1
		2006				1		1	1.04	2
Honolulu International Airport, Honolulu (HNL)	AWP	2003				1	1	2	0.64	3
		2004				1		1	0.32	3
		2005			1		2	3	0.90	3
		2006					2	2	0.63	4
Kahului Airport, Kahului (OGG)	AWP	2003				1	1	2	1.30	3
		2004								1
		2005				1	1	2	1.19	1
		2006								
Kalaeloa Airport, Kapolei (JRF)	AWP	2003								
		2004								
		2005								1
		2006								2

IDAHO

Airport, City (Airport Code)	Region	Fiscal year	Severity					Total RIs	Annual RI Rate	Total SIs
			Collision	A	B	C	D			
Boise Air Terminal - Gowen Field, Boise (BOI)	ANM	2003								3
		2004					1	1	0.60	1
		2005				2		2	1.16	
		2006					1	1	0.58	1
Friedman Memorial Airport, Hailey (SUN)	ANM	2003								
		2004								1
		2005								
		2006		2				2	4.83	
Idaho Falls Regional Airport, Idaho Falls (IDA)	ANM	2003				1		1	1.99	2
		2004								
		2005								
		2006								3
Joslin Field-Magic Valley Regional, Twin Falls (TWF)	ANM	2003								
		2004								
		2005								1
		2006								
Pocatello Regional Airport, Pocatello (PIH)	ANM	2003								
		2004								
		2005								
		2006								1

ILLINOIS

Airport, City (Airport Code)	Region	Fiscal year	Severity					Total RIs	Annual RI Rate	Total SIs
			Collision	A	B	C	D			
Aurora Municipal Airport, Aurora (ARR)	AGL	2003								
		2004								1
		2005								
		2006								
Capital Airport, Springfield (SPI)	AGL	2003								1
		2004								3
		2005								2
		2006					1	1	1.95	1
Chicago Midway International Airport, Chicago (MDW)	AGL	2003					1	1	0.31	
		2004				3	1	4	1.17	
		2005			1	2	1	4	1.33	
		2006					1	1	0.34	1
Chicago O'Hare International Airport, Chicago (ORD)	AGL	2003				6	1	7	0.76	5
		2004				4	3	7	0.71	5
		2005		1	1		4	6	0.61	7
		2006		2	1	4	2	9	0.94	10

ILLINOIS – Continued

Airport, City (Airport Code)	Region	Fiscal year	Severity					Total RIs	Annual RI Rate	Total SIs
			Collision	A	B	C	D			
Dupage Airport, West Chicago, (DPA)	AGL	2003								1
		2004								1
		2005				1	1	2	1.34	1
		2006				1		1	0.97	
Greater Peoria Regional Airport, Peoria (PIA)	AGL	2003								1
		2004								
		2005								1
		2006								3
Greater Rockford Airport, Rockford (RFD)	AGL	2003								2
		2004					1	1	1.34	3
		2005					2	2	2.85	3
		2006				1	1	2	2.67	2
Palwaukee Municipal/Chicago Executive Airport, Prospect Heights/Wheeling (PWK)	AGL	2003				1		1	0.59	
		2004				2	3	5	3.12	
		2005					1	1	0.76	
		2006		1		1		2	1.87	
Quad City International Airport, Moline (MLI)	AGL	2003					2	2	2.99	3
		2004				2	1	3	4.54	3
		2005								
		2006					1	1	1.89	1
St. Louis Regional Airport, Alton/St. Louis (ALN)	AGL	2003								
		2004					1	1	1.42	1
		2005								
		2006								
St. Louis Downtown Airport, Cahokia/St. Louis (CPS)	AGL	2003				1		1	0.60	2
		2004				1	1	2	1.16	1
		2005								
		2006					1	1	0.65	2
Waukegan Regional Airport, Waukegan (UGN)	AGL	2003								1
		2004		1				1	1.21	
		2005								
		2006								
Willard Airport - University of Illinois, Champaign/Urbana (CMI)	AGL	2003				1		1	0.75	
		2004								
		2005								1
		2006				1		1	0.84	1

INDIANA

Airport, City (Airport Code)	Region	Fiscal year	Severity					Total RIs	Annual RI Rate	Total SIs
			Collision	A	B	C	D			
Columbus Municipal Airport, Columbus (BAK)	AGL	2003								
		2004								
		2005								
		2006								2
Delaware County-Johnson Field, Muncie (MIE)	AGL	2003								
		2004								
		2005								
		2006				1		1	3.84	
Evansville Regional Airport, Evansville (EVV)	AGL	2003								
		2004								
		2005								1
		2006					1	1	1.53	
Ft. Wayne International Airport, Ft. Wayne (FWA)	AGL	2003				1	1	2	2.45	3
		2004				1		1	1.20	1
		2005				1		1	1.24	
		2006					4	4	5.42	1
Gary/Chicago Airport, Gary (GYY)	AGL	2003				1		1	2.10	
		2004								
		2005								
		2006								
Indianapolis International Airport, Indianapolis (IND)	AGL	2003				1	1	2	0.98	2
		2004								1
		2005								3
		2006								4
Monroe County Airport, Bloomington (BMG)	AGL	2003								
		2004								1
		2005								
		2006								
Purdue University Airport, Lafayete (LAF)	AGL	2003								
		2004					1	1	0.82	
		2005				1		1	0.89	
		2006					1	1	0.87	
Terre Haute International-Hulman Field, Terre Haute (HUF)	AGL	2003					1	1	1.14	1
		2004				1		1	1.11	
		2005					1	1	1.24	
		2006								3
South Bend Regional Airport, South Bend (SBN)	AGL	2003								1
		2004								
		2005				1		1	1.52	1
		2006					1	1	1.67	

IOWA

Airport, City (Airport Code)	Region	Fiscal Year	Severity					Total RIs	Annual RI Rate	Total SIs
			Collision	A	B	C	D			
Des Moines International Airport, Des Moines (DSM)	ACE	2003					1	1	0.85	1
		2004				1	1	2	1.76	1
		2005								3
		2006				1	1	2	1.85	1
Dubuque Regional Airport, Dubuque (DBQ)	ACE	2003								
		2004								
		2005								1
		2006								1
Eastern Iowa Airport, Cedar Rapids (CID)	ACE	2003								
		2004								1
		2005								
		2006								
Sioux Gateway/Col. Bud Day Field, Sioux City (SUX)	ACE	2003								
		2004								2
		2005								
		2006					2	2	7.05	1
Waterloo Municipal Airport, Waterloo (ALO)	ACE	2003					1	1	2.70	2
		2004								
		2005					1	1	2.94	1
		2006								

KANSAS

Airport, City (Airport Code)	Region	Fiscal Year	Severity					Total RIs	Annual RI Rate	Total SIs
			Collision	A	B	C	D			
Forbes Field, Topeka (FOE)	ACE	2003								5
		2004								
		2005								
		2006								2
Garden City Regional Airport, Garden City (GCK)	ACE	2003								6
		2004				1	1	2	8.75	1
		2005				1		1	4.95	1
		2006								
Hutchinson Municipal Airport, Hutchinson (HUT)	ACE	2003								2
		2004								1
		2005					1	1	2.02	
		2006								
Johnson County Executive Airport, Olathe (OJC)	ACE	2003								4
		2004								
		2005								
		2006								

KANSAS – Continued

Airport, City (Airport Code)	Region	Fiscal Year	Severity					Total RIs	Annual RI Rate	Total SIs
			Collision	A	B	C	D			
New Century AirCenter Airport, Olathe (IXD)	ACE	2003				1		1	1.62	
		2004								1
		2005								
		2006					1	1	1.83	1
Salina Municipal Airport, Salina (SLN)	ACE	2003				1		1	1.12	
		2004								1
		2005								
		2006								
Wichita Mid-Continent Airport, Wichita (ICT)	ACE	2003					1	1	0.55	1
		2004				1	1	2	1.12	2
		2005				1	1	2	1.10	3
		2006					1	1	0.57	4

KENTUCKY

Airport, City (Airport Code)	Region	Fiscal Year	Severity					Total RIs	Annual RI Rate	Total SIs
			Collision	A	B	C	D			
Blue Grass Airport, Lexington (LEX)	ASO	2003								
		2004								
		2005								
		2006								3
Louisville International-Standiford Field, Louisville (SDF)	ASO	2003			1		3	4	2.28	1
		2004								1
		2005								
		2006					1	1	0.56	2
Owensboro-Davies County Airport, Owensboro (OWB)	ASO	2003								1
		2004								
		2005								
		2006								

LOUISIANA

Airport, City (Airport Code)	Region	Fiscal Year	Severity					Total RIs	Annual RI Rate	Total SIs
			Collision	A	B	C	D			
Acadiana Regional, New Iberia (ARA)	ASW	2003								3
		2004			1			1	1.40	1
		2005								
		2006								
Baton Rouge Metropolitan Airport, Baton Rouge (BTR)	ASW	2003					1	1	0.97	1
		2004								1
		2005								
		2006								1

LOUISIANA – Continued

Airport, City (Airport Code)	Region	Fiscal Year	Severity					Total RIs	Annual RI Rate	Total SIs
			Collision	A	B	C	D			
Chennault International, Lake Charles (CWF)	ASW	2003								
		2004								
		2005								
		2006								1
Lafayette Regional Airport, Lafayette (LFT)	ASW	2003								
		2004								
		2005				1		1	1.34	1
		2006								
Lake Charles Regional Airport, Lake Charles (LCH)	ASW	2003								
		2004								1
		2005								
		2006								
Lakefront Airport, New Orleans (NEW)	ASW	2003					1	1	1.02	
		2004								
		2005				1		1	1.14	1
		2006								
Louis Armstrong New Orleans International Airport, New Orleans (MSY)	ASW	2003					1	1	0.70	
		2004								
		2005								2
		2006					3	3	2.78	
Monroe Regional Airport, Monroe (MLU)	ASW	2003								2
		2004								
		2005								
		2006								
Shreveport Downtown Airport, Shreveport (DTN)	ASW	2003								
		2004								3
		2005								
		2006								1
Shreveport Regional Airport, Shreveport (SHV)	ASW	2003								
		2004								1
		2005								
		2006								

MAINE

Airport, City (Airport Code)	Region	Fiscal Year	Severity					Total RIs	Annual RI Rate	Total SIs
			Collision	A	B	C	D			
Bangor International Airport, Bangor (BGR)	ANE	2003								2
		2004								1
		2005								
		2006								2
Portland International Jetport, Portland (PWM)	ANE	2003								
		2004								
		2005								1
		2006								5

MARYLAND

Airport, City (Airport Code)	Region	Fiscal Year	Severity					Total RIs	Annual RI Rate	Total SIs
			Collision	A	B	C	D			
Andrews Air Force Base, Camp Springs (ADW)	AEA	2003								4
		2004					1	1	1.30	3
		2005				2		2	2.23	
		2006								
Baltimore/Washington International Thurgood Marshall Airport, Baltimore (BWI)	AEA	2003				1	1	2	0.68	2
		2004				1	1	2	0.65	6
		2005			1	2	1	4	1.28	1
		2006								
Salisbury-Ocean City Wicomico Regional Airport, Salisbury (SBY)	AEA	2003					1	1	1.98	
		2004				1		1	1.76	
		2005								
		2006								

MASSACHUSETTS

Airport, City (Airport Code)	Region	Fiscal Year	Severity					Total RIs	Annual RI Rate	Total SIs
			Collision	A	B	C	D			
Barnstable Municipal Airport, Hyannis (HYA)	ANE	2003								
		2004			1	1		2	1.72	
		2005								
		2006								
Beverly Municipal Airport, Beverly (BVY)	ANE	2003					1	1	1.21	
		2004								
		2005								
		2006								
Hanscomb Field, Bedford (BED)	ANE	2003								
		2004								1
		2005			1			1	0.58	
		2006				1	1	2	1.18	

MASSACHUSETTS – Continued

Airport, City (Airport Code)	Region	Fiscal Year	Severity					Total RIs	Annual RI Rate	Total SIs
			Collision	A	B	C	D			
Lawrence Municipal Airport, Lawrence (LWM)	ANE	2003								1
		2004								
		2005								
		2006				1		1	1.24	
General Edward Logan International Airport, Boston (BOS)	ANE	2003				2		2	0.52	1
		2004					1	1	0.24	
		2005		1		3	11	15	3.50	4
		2006				2	5	7	1.70	12
Martha's Vineyard Airport, Vineyard Haven (MVY)	ANE	2003								
		2004								
		2005					1	1	1.89	
		2006								
Nantucket Memorial Airport, Nantucket (ACK)	ANE	2003								
		2004			1			1	0.70	
		2005								1
		2006								
Norwood Memorial Airport, Norwood (OWD)	ANE	2003								
		2004								
		2005								
		2006								1

MICHIGAN

Airport, City (Airport Code)	Region	Fiscal Year	Severity					Total RIs	Annual RI Rate	Total SIs
			Collision	A	B	C	D			
Battle Creek International Airport, Kalamazoo (AZO)	AGL	2003								
		2004					1	1	1.05	
		2005			1		1	2	2.16	4
		2006				2		2	2.70	2
Bishop International Airport, Flint (FNT)	AGL	2003								
		2004								
		2005				1		1	0.75	
		2006								2
Capital City Airport, Lansing (LAN)	AGL	2003								1
		2004								
		2005				1		1	1.19	1
		2006								3
Coleman A. Young/Detroit City Airport, Detroit (DET)	AGL	2003								
		2004								
		2005					2	2	2.60	1
		2006								2

MICHIGAN – Continued

Airport, City (Airport Code)	Region	Fiscal Year	Severity					Total RIs	Annual RI Rate	Total SIs
			Collision	A	B	C	D			
Detroit Metropolitan Wayne County Airport, Romulus (DTW)	AGL	2003				1	2	3	0.61	
		2004					5	5	0.97	2
		2005					1	1	0.19	
		2006					2	2	0.41	4
Gerald R. Ford International Airport, Grand Rapids (GRR)	AGL	2003								
		2004								
		2005								
		2006								1
Jackson County-Reynolds Field Airport, Jackson (JXN)	AGL	2003								
		2004								
		2005								1
		2006					2	2	4.14	1
MBS International Airport, Saginaw, (MBS)	AGL	2003								
		2004								
		2005								1
		2006								2
Muskegon County Airport, Muskegon (MKG)	AGL	2003								5
		2004								1
		2005				1		1	1.92	2
		2006								
Oakland County International Airport, Pontiac (PTK)	AGL	2003								
		2004								1
		2005					1	1	0.46	1
		2006		1				1	0.51	4
Sawyer International Airport, Marquette (SAW)	AGL	2003								
		2004								
		2005								
		2006								1
W. K. Kellogg Airport, Battle Creek (BTL)	AGL	2003								
		2004								
		2005								1
		2006								1
Willow Run Airport, Ypsilanti (YIP)	AGL	2003				1	2	3	2.65	13
		2004			1		1	2	1.74	1
		2005				2		2	1.87	1
		2006					1	1	1.12	

MINNESOTA

Airport, City (Airport Code)	Region	Fiscal Year	Severity					Total RIs	Annual RI Rate	Total SIs
			Collision	A	B	C	D			
Anoka County - Blaine Airport, Blaine (ANE)	AGL	2003								
		2004								1
		2005								
		2006								
Crystal Airport, Minneapolis (MIC)	AGL	2003					4	4	3.76	
		2004								1
		2005				1		1	1.40	2
		2006								1
Duluth International Airport, Duluth (DLH)	AGL	2003								4
		2004								
		2005					1	1	1.45	3
		2006		1				1	1.53	
Flying Cloud Airport, Minneapolis, (FCM)	AGL	2003				1	1	2	1.26	6
		2004				1		1	0.63	4
		2005								
		2006					2	2	1.41	2
Minneapolis-St. Paul International/ Wold-Chamberlain Airport, Minneapolis (MSP)	AGL	2003				1	3	4	0.79	6
		2004				1	1	2	0.37	3
		2005					5	5	0.92	3
		2006				3	2	5	1.04	1
Rochester International Airport, Rochester (RST)	AGL	2003					1	1	1.42	1
		2004					1	1	1.45	
		2005					1	1	1.51	2
		2006								
St. Cloud Regional Airport, St. Cloud (STC)	AGL	2003								
		2004								
		2005								5
		2006								5
St. Paul Downtown Holman Field, St. Paul (STP)	AGL	2003								
		2004					1	1	0.76	5
		2005					1	1	0.80	5
		2006								3

MISSISSIPPI

Airport, City (Airport Code)	Region	Fiscal Year	Severity					Total RIs	Annual RI Rate	Total SIs
			Collision	A	B	C	D			
Golden Triangle Regional Airport, Columbus (GTR)	ASO	2003								
		2004								1
		2005								3
		2006								1
Gulfport-Biloxi International Airport, Gulfport (GPT)	ASO	2003					1	1	0.94	6
		2004								1
		2005								1
		2006		1				1	1.57	2
Hawkins Field, Jackson (HKS)	ASO	2003								
		2004								1
		2005								
		2006								
Jackson International Airport, Jackson (JAN)	ASO	2003								
		2004								
		2005								1
		2006								
Mid Delta Regional Airport, Greenville (GLH)	ASO	2003								
		2004								
		2005								
		2006								1
Tupelo Regional Airport, Tupelo (TUP)	ASO	2003								
		2004								
		2005								1
		2006								

MISSOURI

Airport, City (Airport Code)	Region	Fiscal Year	Severity					Total RIs	Annual RI Rate	Total SIs
			Collision	A	B	C	D			
Cape Girardeau Regional Airport, Cape Girardeau (CGI)	ACE	2003					1	1	N/A	
		2004								1
		2005								
		2006								
Charles B. Wheeler Downtown Airport, Kansas City (MKC)	ACE	2003								
		2004								
		2005					2	2	1.97	7
		2006				1	5	6	7.42	4
Joplin Regional Airport, Joplin (JLN)	ACE	2003								1
		2004								4
		2005								
		2006								1

MISSOURI – Continued

Airport, City (Airport Code)	Region	Fiscal Year	Severity					Total RIs	Annual RI Rate	Total SIs
			Collision	A	B	C	D			
Kansas City International Airport, Kansas City (MCI)	ACE	2003								1
		2004								
		2005								2
		2006								2
Lambert-St. Louis International Airport, St. Louis (STL)	ACE	2003			2	2	4	8	1.90	4
		2004				1		1	0.33	5
		2005				1	1	2	0.67	1
		2006					1	1	0.35	1
Spirit of St. Louis Airport, St. Louis (SUS)	ACE	2003								
		2004								
		2005								
		2006								3
Springfield-Branson Regional, Springfield (SGF)	ACE	2003					1	1	1.10	
		2004								
		2005		1				1	1.16	
		2006								1

MONTANA

Airport, City (Airport Code)	Region	Fiscal Year	Severity					Total RIs	Annual RI Rate	Total SIs
			Collision	A	B	C	D			
Billings Logan International Airport, Billings (BIL)	ANM	2003								3
		2004					1	1	1.01	1
		2005								4
		2006								3
Gallatin Field, Bozeman (BZN)	ANM	2003								
		2004								
		2005								1
		2006								3
Glacier Park International Airport, Kalispell (GPI)	ANM	2003								
		2004								
		2005								1
		2006								
Great Falls International Airport, Great Falls (GTF)	ANM	2003								
		2004								
		2005					1	1	2.07	1
		2006								
Helena Regional Airport, Helena (HLN)	ANM	2003								
		2004				1		1	1.70	
		2005								2
		2006								2

NEBRASKA

Airport, City (Airport Code)	Region	Fiscal Year	Severity					Total RIs	Annual RI Rate	Total SIs
			Collision	A	B	C	D			
Central Nebraska Regional Airport, Grand Island (GRI)	ACE	2003								3
		2004								1
		2005								
		2006								
Eppley Airfield, Omaha (OMA)	ACE	2003			1		1	2	1.40	3
		2004					1	1	0.71	3
		2005					1	1	0.68	4
		2006					1	1	0.71	5
Lincoln Municipal Airport, Lincoln (LNK)	ACE	2003								4
		2004								5
		2005					2	2	2.55	4
		2006					1	1	1.17	1

NEVADA

Airport, City (Airport Code)	Region	Fiscal Year	Severity					Total RIs	Annual RI Rate	Total SIs
			Collision	A	B	C	D			
Elko Regional Airport, Elko (EKO)	AWP	2003								3
		2004					1	1	3.79	2
		2005								1
		2006								4
McCarran International Airport, Las Vegas (LAS)	AWP	2003					3	3	0.60	4
		2004				2	2	4	0.71	4
		2005				2	4	6	0.99	2
		2006				1	4	5	0.81	3
Reno/Tahoe International Airport, Reno (RNO)	AWP	2003				2		2	1.43	10
		2004				2	1	3	2.08	6
		2005					3	3	1.95	3
		2006		1			1	2	1.30	7
North Las Vegas Airport, Las Vegas (VGT)	AWP	2003	1			2		3	1.34	3
		2004		1		1	1	3	1.30	3
		2005		1		1	5	7	3.11	4
		2006				3	5	8	3.44	9

NEW HAMPSHIRE

Airport, City (Airport Code)	Region	Fiscal Year	Severity					Total RIs	Annual RI Rate	Total SIs
			Collision	A	B	C	D			
Boire Field, Nashua (ASH)	ANE	2003								
		2004								
		2005								1
		2006					1	1	0.85	1
Manchester Airport, Manchester (MHT)	ANE	2003			1			1	1.04	1
		2004								1
		2005					1	1	0.94	2
		2006								

NEW JERSEY

Airport, City (Airport Code)	Region	Fisca Year	Severity					Total RIs	Annual RI Rate	Total SIs
			Collision	A	B	C	D			
Atlantic City International Airport, Atlantic City (ACY)	AEA	2003								
		2004								4
		2005								1
		2006								
Essex County Airport, Caldwell (CDW)	AEA	2003								
		2004					1	1	0.93	2
		2005			1	1		2	1.79	3
		2006								3
Morristown Municipal Airport, Morristown (MMU)	AEA	2003			1	1		2	0.97	
		2004								1
		2005								
		2006								
Newark Liberty International Airport, Newark (EWR)	AEA	2003	1				2	3	0.74	2
		2004		1		1	3	5	1.15	4
		2005		1			4	5	1.13	5
		2006				2	5	7	1.56	2
Teterboro Airport, Teterboro (TEB)	AEA	2003					1	1	0.46	3
		2004				1	3	4	1.81	
		2005			1	2	1	4	1.83	6
		2006					3	3	1.50	5
Trenton Mercer Airport, Trenton (TTN)	AEA	2003								1
		2004								
		2005								1
		2006								2

NEW MEXICO

Airport, City (Airport Code)	Region	Fiscal Year	Severity					Total RIs	Annual RI Rate	Total SIs
			Collision	A	B	C	D			
Albuquerque International Airport, Albuquerque (ABQ)	ASW	2003				1		1	0.44	1
		2004				1	1	2	1.00	
		2005					1	1	0.51	2
		2006				1	1	2	1.02	2
Roswell Industrial Air Center Airport, Roswell (ROW)	ASW	2003								1
		2004								
		2005					1	1	1.62	1
		2006								

NEW YORK

Airport, City (Airport Code)	Region	Fiscal Year	Severity					Total RIs	Annual RI Rate	Total SIs
			Collision	A	B	C	D			
Albany International Airport, Albany (ALB)	AEA	2003								
		2004					1	1	0.74	1
		2005								
		2006								
Binghamton Regional Airport, Binghamton (BGM)	AEA	2003					1	1	2.65	
		2004					1	1	2.77	1
		2005								
		2006								2
Buffalo Niagra International Airport, Buffalo (BUF)	AEA	2003								1
		2004		1				1	0.71	
		2005								1
		2006								
Dutchess County Airport, Poughkeepsie (POU)	AEA	2003								
		2004								1
		2005								1
		2006					1	1	0.88	
Elmira/Corning Regional Airport, Elmira (ELM)	AEA	2003								5
		2004					1	1	2.00	1
		2005								
		2006					1	1	2.58	1
Greater Rochester International Airport, Rochester (ROC)	AEA	2003				1		1	0.72	6
		2004								1
		2005								1
		2006					1	1	0.73	1
Ithaca Tompkins Regional Airport, Ithaca (ITH)	AEA	2003								1
		2004								
		2005								1
		2006								1

NEW YORK – Continued

Airport, City (Airport Code)	Region	Fiscal Year	Severity					Total RIs	Annual RI Rate	Total SIs
			Collision	A	B	C	D			
John F. Kennedy International Airport, New York (JFK)	AEA	2003					1	1	0.34	3
		2004					1	1	0.31	
		2005		1		1	2	4	1.11	1
		2006				1	3	4	1.06	3
La Guardia Airport, New York (LGA)	AEA	2003				1	1	2	0.53	2
		2004					1	1	0.25	1
		2005								1
		2006					2	2	0.49	
Long Island MacArthur Airport, Islip (ISP)	AEA	2003		1				1	0.54	1
		2004					1	1	0.56	
		2005					1	1	0.57	1
		2006		1				1	0.54	3
Niagra Falls International Airport, Niagra Falls (IAG)	AEA	2003								
		2004								
		2005					1	1	2.12	
		2006								5
Oneida County Airport, Utica (UCA)	AEA	2003								
		2004								
		2005								1
		2006								2
Republic Airport, Farmingdale (FRG)	AEA	2003				1		1	0.53	
		2004					1	1	0.50	
		2005					1	1	0.49	2
		2006				1		1	0.52	
Stewart International Airport, Newburgh (SWF)	AEA	2003		1				1	0.91	
		2004		1				1	0.97	
		2005								
		2006								
Syracuse Hancock International Airport, Syracuse (SYR)	AEA	2003								
		2004								3
		2005					2	2	1.61	1
		2006					1	1	0.86	
Westchester County Airport, White Plains (HPN)	AEA	2003					1	1	0.53	2
		2004			1			1	0.52	1
		2005				2		2	1.02	1
		2006				1		1	0.52	

NORTH CAROLINA

Airport, City (Airport Code)	Region	Fiscal Year	Severity					Total RIs	Annual RI Rate	Total SIs
			Collision	A	B	C	D			
Asheville Regional Airport, Asheville (AVL)	ASO	2003								
		2004								1
		2005								
		2006								1
Charlotte/Douglas International Airport, Charlotte (CLT)	ASO	2003				1	2	3	0.68	2
		2004					1	1	0.22	3
		2005					4	4	0.77	2
		2006				1	1	2	0.39	7
Concord Regional Airport, Concord (JQF)	ASO	2003								
		2004								
		2005								1
		2006								
Craven County Regional, New Bern (EWN)	ASO	2003								2
		2004								
		2005								
		2006								
Hickory Regional Airport, Hickory (HKY)	ASO	2003								
		2004								2
		2005								
		2006								
Kinston Regional Airport at Stallings Field, Kinston (ISO)	ASO	2003					1	1	3.28	
		2004								
		2005								
		2006								
Piedmont Triad International Airport, Greensboro (GSO)	ASO	2003					1	1	0.85	
		2004								1
		2005					1	1	0.74	
		2006								3
Raleigh-Durham International Airport, Raleigh (RDU)	ASO	2003								4
		2004								
		2005								2
		2006					1	1	0.41	4
Wilmington International Airport, Wilmington (ILM)	ASO	2003				1	1	2	2.54	
		2004				1	1	2	2.42	
		2005								2
		2006								2

NORTH DAKOTA

Airport, City (Airport Code)	Region	Fiscal Year	Severity					Total RIs	Annual RI Rate	Total SIs
			Collision	A	B	C	D			
Bismarck Municipal Airport, Bismarck (BIS)	AGL	2003								
		2004								
		2005								
		2006								1
Grand Forks International Airport, Grand Forks (GFK)	AGL	2003								2
		2004		1	1			2	0.75	2
		2005		1				1	0.39	1
		2006				1		1	0.44	3
Hector International Airport, Fargo (FAR)	AGL	2003								
		2004								6
		2005					1	1	1.26	3
		2006								2

OHIO

Airport, City (Airport Code)	Region	Fiscal Year	Severity					Total RIs	Annual RI Rate	Total SIs
			Collision	A	B	C	D			
Akron-Canton Regional Airport, Akron (CAK)	AGL	2003								3
		2004								1
		2005				1	1	2	1.86	2
		2006					1	1	0.93	1
Bolton Field, Columbus (TZR)	AGL	2003								
		2004								
		2005								1
		2006								1
Burke Lakefront Airport, Cleveland (BKL)	AGL	2003								
		2004								
		2005								1
		2006								
Cincinnati/Northern Kentucky International Airport, Cincinnati (CVG)	AGL	2003				3	1	4	0.80	1
		2004				4	2	6	1.16	
		2005		1		2	1	4	0.77	
		2006				1		1	0.27	1
Cincinnati-Lunkin Airport, Cincinnati (LUK)	AGL	2003				1	1	2	1.69	3
		2004								
		2005					1	1	1.15	1
		2006								1
Cleveland-Hopkins International Airport, Cleveland (CLE)	AGL	2003								4
		2004				3	2	5	1.89	2
		2005					2	2	0.76	2
		2006		1			3	4	1.59	2

OHIO – Continued

Airport, City (Airport Code)	Region	Fiscal Year	Severity: Collision	A	B	C	D	Total RIs	Annual RI Rate	Total SIs
Cuyahoga County Airport, Cleveland (CGF)	AGL	2003								1
		2004								
		2005								
		2006								
James M. Cox Dayton International Airport, Dayton (DAY)	AGL	2003								2
		2004								1
		2005								2
		2006								2
Mansfield Lahm Regional Airport, Mansfield (MFD)	AGL	2003								
		2004					1	1	2.73	
		2005					2	2	6.00	1
		2006				1	1	2	5.60	1
Ohio State University Airport, Columbus (OSU)	AGL	2003								
		2004					2	2	2.00	1
		2005								1
		2006								
Port Columbus International Airport, Columbus (CMH)	AGL	2003				1		1	0.42	1
		2004					1	1	0.44	
		2005								
		2006								3
Toledo Express Airport, Toledo (TOL)	AGL	2003								1
		2004								
		2005								
		2006								1
Youngstown-Warren Regional Airport, Youngstown (YNG)	AGL	2003					1	1	1.32	1
		2004								
		2005								1
		2006					1	1	1.34	1

OKLAHOMA

Airport, City (Airport Code)	Region	Fiscal Year	Severity: Collision	A	B	C	D	Total RIs	Annual RI Rate	Total SIs
Ardmore Municipal Airport, Ardmore (ADM)	ASW	2003								
		2004								1
		2005								
		2006								1
Enid Woodring Regional, Enid (WDG)	ASW	2003								1
		2004								
		2005								1
		2006			1			1	3.29	

OKLAHOMA – Continued

Airport, City (Airport Code)	Region	Fiscal Year	Severity					Total RIs	Annual RI Rate	Total SIs
			Collision	A	B	C	D			
Richard Lloyd Jones Jr. Airport, Tulsa (RVS)	ASW	2003			1			1	0.33	
		2004					1	1	0.35	
		2005				1	2	3	0.89	1
		2006					1	1	0.39	4
Stillwater Regional Airport, Stillwater (SWO)	ASW	2003								
		2004				1		1	1.67	2
		2005								
		2006								
Tulsa International Airport, Tulsa (TUL)	ASW	2003				1		1	0.57	1
		2004								4
		2005					1	1	0.63	2
		2006								1
University of Oklahoma Westheimer Airport, Norman (OUN)	ASW	2003								
		2004								
		2005					1	1	0.98	
		2006								
Wiley Post Airport, Oklahoma City (PWA)	ASW	2003								1
		2004								
		2005								
		2006								1
Will Rogers World Airport, Oklahoma City (OKC)	ASW	2003								1
		2004								5
		2005				1		1	0.88	1
		2006								4

OREGON

Airport, City (Airport Code)	Region	Fiscal Year	Severity					Total RIs	Annual RI Rate	Total SIs
			Collision	A	B	C	D			
Mahlon Sweet Field Airport, Eugene (EUG)	ANM	2003				1		1	1.09	8
		2004					2	2	2.16	8
		2005								3
		2006					1	1	1.09	1
McNary Field, Salem (SLE)	ANM	2003								1
		2004								2
		2005					2	2	4.11	
		2006								1
Portland International Airport, Portland (PDX)	ANM	2003					1	1	0.37	3
		2004								
		2005					1	1	0.38	
		2006					1	1	0.38	

OREGON – Continued

Airport, City (Airport Code)	Region	Fiscal Year	Severity: Collision	A	B	C	D	Total RIs	Annual RI Rate	Total SIs
Portland-Hillsboro Airport, Portland (HIO)	ANM	2003								
		2004			1			1	0.55	
		2005					1	1	0.46	
		2006								
Portland-Troutdale Airport, Portland (TTD)	ANM	2003				1		1	1.35	6
		2004								1
		2005								3
		2006								3
Roberts Field, Redmond (RDM)	ANM	2003								
		2004					1	1	1.78	
		2005								
		2006								

PENNSYLVANIA

Airport, City (Airport Code)	Region	Fiscal Year	Severity: Collision	A	B	C	D	Total RIs	Annual RI Rate	Total SIs
Allegheny County Airport, West Mifflin (AGC)	AEA	2003			1	1	1	3	2.92	
		2004					1	1	1.09	2
		2005								
		2006								
Capital City Airport, New Cumberland (CXY)	AEA	2003		1				1	1.95	
		2004								3
		2005								
		2006								
Erie International/Tom Ridge Field, Erie (ERI)	AEA	2003								
		2004								
		2005								1
		2006								
Harrisburg International Airport, Harrisburg (MDT)	AEA	2003								
		2004								8
		2005								4
		2006								
Lancaster Airport, Lititz (LNS)	AEA	2003								
		2004								1
		2005								1
		2006								
Lehigh Valley International, Allentown (ABE)	AEA	2003								
		2004								1
		2005								1
		2006								

PENNSYLVANIA – Continued

Airport, City (Airport Code)	Region	Fiscal Year	Severity					Total RIs	Annual RI Rate	Total SIs
			Collision	A	B	C	D			
Northeast Philadelphia Airport, Philadelphia (PNE)	AEA	2003								
		2004				1		1	0.90	1
		2005					1	1	0.92	2
		2006				1	2	3	2.91	1
Philadelphia International Airport, Philadelphia (PHL)	AEA	2003			1	4	6	11	2.45	2
		2004				2	5	7	1.53	6
		2005	1			2	6	9	1.68	5
		2006				3	4	7	1.35	
Pittsburgh International Airport, Pittsburgh (PIT)	AEA	2003					1	1	0.27	4
		2004				1		1	0.28	2
		2005					1	1	0.36	2
		2006								
Reading Regional/Carl A. Spaatz Field, Reading (RDG)	AEA	2003								1
		2004								1
		2005								
		2006								
Wilkes-Barre/Scranton International Airport, Avoca (AVP)	AEA	2003								
		2004								1
		2005								
		2006								
Williamsport Regional Airport, Williamsport (IPT)	AEA	2003								1
		2004								
		2005								
		2006								

PUERTO RICO

Airport, City (Airport Code)	Region	Fiscal Year	Severity					Total RIs	Annual RI Rate	Total SIs
			Collision	A	B	C	D			
Fernando Luis Ribas Dominicci Airport, San Juan (SIG)	ASO	2003								1
		2004				2	1	3	2.40	6
		2005								3
		2006								1
Luis Munoz Marin International, San Juan (SJU)	ASO	2003								6
		2004								8
		2005								8
		2006					1	1	0.51	9

RHODE ISLAND

Airport, City (Airport Code)	Region	Fiscal Year	Severity					Total RIs	Annual RI Rate	Total SIs
			Collision	A	B	C	D			
Theodore Francis Green State Airport, Providence (PVD)	ANE	2003					1	1	0.75	1
		2004				1		1	0.85	
		2005				1		1	0.81	
		2006				2	1	3	2.80	1

SOUTH CAROLINA

Airport, City (Airport Code)	Region	Fiscal Year	Severity					Total RIs	Annual RI Rate	Total SIs
			Collision	A	B	C	D			
Charleston International Airport, Charleston (CHS)	ASO	2003					1	1	0.84	
		2004								3
		2005		1		1	1	3	2.39	3
		2006				1	1	2	1.81	5
Columbia Metropolitan Airport, Columbia (CAE)	ASO	2003								2
		2004				2		2	1.73	
		2005								1
		2006								5
Florence Regional Airport, Florence (FLO)	ASO	2003								
		2004								
		2005								
		2006								2
Greenville-Spartanburg International Airport, Greer (GSP)	ASO	2003								1
		2004								
		2005								
		2006								
Myrtle Beach International Airport, Myrtle Beach (MYR)	ASO	2003								1
		2004								1
		2005								
		2006								

SOUTH DAKOTA

Airport, City (Airport Code)	Region	Fiscal Year	Severity					Total RIs	Annual RI Rate	Total SIs
			Collision	A	B	C	D			
Joe Foss Field, Sioux Falls Regional Airport, Sioux Falls (FSD)	AGL	2003				2		2	2.12	1
		2004								
		2005					1	1	1.10	4
		2006					1	1	1.14	3
Rapid City Regional Airport, Rapid City (RAP)	AGL	2003				1		1	1.79	3
		2004								2
		2005								1
		2006								

TENNESSEE

Airport, City (Airport Code)	Region	Fisca Year	Severity					Total RIs	Annual RI Rate	Total SIs
			Collision	A	B	C	D			
Lovell Field, Chattanooga (CHA)	ASO	2003								
		2004								
		2005								
		2006								1
McGhee Tyson Airport, Knoxville (TYS)	ASO	2003				2	3	5	3.58	8
		2004								3
		2005				1	1	2	1.46	2
		2006					1	1	0.76	1
Memphis International Airport, Memphis (MEM)	ASO	2003					2	2	0.50	3
		2004				1	3	4	1.05	1
		2005					1	1	0.25	3
		2006					2	2	0.51	3
Nashville International Airport, Nashville (BNA)	ASO	2003					1	1	0.44	4
		2004		1		1	1	3	1.28	5
		2005								3
		2006				1	1	2	0.94	2
Smyrna Airport, Smyrna (MQY)	ASO	2003								
		2004				1	1	2	2.44	
		2005								
		2006								2
Tri-Cities Regional Airport, Blountville (TRI)	ASO	2003					1	1	1.13	
		2004								1
		2005								2
		2006								

TEXAS

Airport, City (Airport Code)	Region	Fiscal Year	Severity					Total RIs	Annual RI Rate	Total SIs
			Collision	A	B	C	D			
Addison Airport, Dallas (ADS)	ASW	2003				1	3	4	2.66	4
		2004								1
		2005				1	1	2	1.50	4
		2006				1	2	3	2.24	
Amarillo International Airport, Amarillo (AMA)	ASW	2003				1		1	0.83	1
		2004								
		2005								5
		2006								
Brownsville/South Padre Island International Airport, Brownsville (BRO)	ASW	2003								
		2004								1
		2005								
		2006								

TEXAS – Continued

Airport, City (Airport Code)	Region	Fiscal Year	Severity					Total RIs	Annual RI Rate	Total SIs
			Collision	A	B	C	D			
Corpus Christi International Airport, Corpus Christi (CRP)	ASW	2003								
		2004								
		2005								1
		2006								
Dallas Love Field, Dallas (DAL)	ASW	2003				1		1	0.42	5
		2004				1	1	2	0.79	
		2005					1	1	0.42	4
		2006								
Dallas/Ft. Worth International Airport, Dallas-Ft.Worth (DFW)	ASW	2003				2	4	6	0.78	
		2004				2	5	7	0.86	2
		2005				2	2	4	0.54	4
		2006				2	2	4	0.57	1
David Wayne Hooks Memorial Airport, Houston (DWH)	ASW	2003				2	1	3	1.47	6
		2004				1		1	0.46	
		2005			1		1	2	0.96	2
		2006					1	1	0.38	3
Denton Airport, Denton (DTO)	ASW	2003								
		2004								2
		2005								8
		2006								1
East Texas Regional Airport, Longview (GGG)	ASW	2003								1
		2004					1	1	1.15	2
		2005					1	1	1.08	
		2006								7
Easterwood Field, College Station CLL)	ASW	2003		1				1	1.51	
		2004								
		2005								
		2006								
El Paso International Airport, El Paso (ELP)	ASW	2003								1
		2004				1		1	0.86	2
		2005					1	1	0.90	1
		2006					1	1	0.99	
Ft. Worth Alliance Airport, Ft. Worth (AFW)	ASW	2003								
		2004								
		2005								
		2006								1
Ft. Worth Meacham International Airport, Ft. Worth (FTW)	ASW	2003				1		1	0.65	5
		2004				1	1	2	1.39	1
		2005								7
		2006				1	1	2	2.40	3

TEXAS – Continued

Airport, City (Airport Code)	Region	Fiscal Year	Severity					Total RIs	Annual RI Rate	Total SIs
			Collision	A	B	C	D			
George Bush Intercontinental Airport, Houston (IAH)	ASW	2003								
		2004								1
		2005				2	2	4	0.72	1
		2006					2	2	0.33	
Laredo International Airport, Laredo (LRD)	ASW	2003								
		2004								
		2005				1		1	1.64	3
		2006								2
Lubbock International Airport, Lubbock (LBB)	ASW	2003								3
		2004				1		1	1.24	4
		2005					1	1	1.01	1
		2006								1
McAllen Miller International Airport, McAllen (MFE)	ASW	2003								
		2004								
		2005								1
		2006								
McKinney Municipal Airport, McKinney (TKI)	ASW	2003								
		2004								1
		2005								6
		2006								1
Midland International Airport, Midland (MAF)	ASW	2003								
		2004								
		2005					1	1	1.15	
		2006								1
San Antonio International Airport, San Antonio (SAT)	ASW	2003				2	2	4	1.61	2
		2004					1	1	0.42	1
		2005					1	1	0.46	2
		2006					1	1	0.47	2
Scholes International Airport, Galveston (GLS)	ASW	2003								
		2004								
		2005								
		2006				1		1	1.46	4
Southeast Texas Regional Airport, Beaumont (BPT)	ASW	2003								
		2004								
		2005								1
		2006								
Sugar Land Municipal/Hull Field, Houston (SGR)	ASW	2003								
		2004								1
		2005								
		2006								

TEXAS – Continued

Airport, City (Airport Code)	Region	Fiscal Year	Severity					Total RIs	Annual RI Rate	Total SIs
			Collision	A	B	C	D			
TSTC Waco Airport, Waco (CNW)	ASW	2003								1
		2004								1
		2005								2
		2006								
Tyler Pounds Regional, Tyler (TYR)	ASW	2003								
		2004		1				1	1.24	1
		2005								
		2006								
Valley International Airport, Harlingen (HRL)	ASW	2003								1
		2004								
		2005								
		2006					1	1	1.89	1
Waco Regional Airport, Waco (ACT)	ASW	2003								2
		2004								
		2005								
		2006				1		1	2.71	1
William P. Hobby Airport, Houston (HOU)	ASW	2003			1	1	2	4	1.64	1
		2004				2		2	0.81	2
		2005								2
		2006								7

UTAH

Airport, City (Airport Code)	Region	Fiscal Year	Severity					Total RIs	Annual RI Rate	Total SIs
			Collision	A	B	C	D			
Ogden-Hinckley Airport, Ogden (OGD)	ANM	2003								
		2004								
		2005								
		2006					2	2	1.67	
Provo Municipal Airport, Provo (PVU)	ANM	2003								
		2004								
		2005								
		2006		1		1	2	4	2.41	4
Salt Lake City International Airport, Salt Lake City (SLC)	ANM	2003				1	2	3	0.75	7
		2004								5
		2005				1	1	2	0.45	4
		2006				3	1	4	0.94	1

VERMONT

Airport, City (Airport Code)	Region	Fiscal Year	Severity					Total RIs	Annual RI Rate	Total SIs
			Collision	A	B	C	D			
Burlington International Airport, Burlington (BTV)	ANE	2003								2
		2004								1
		2005					1	1	0.91	1
		2006								3

VIRGINIA

Airport, City (Airport Code)	Region	Fiscal Year	Severity					Total RIs	Annual RI Rate	Total SIs
			Collision	A	B	C	D			
Lynchburg Regional, Lynchburg (LYH)	AEA	2003								1
		2004								
		2005								
		2006								
Manassas Regional Airport, Manassas (HEF)	AEA	2003								
		2004								1
		2005								
		2006								1
Newport News/Williamsburg International Airport, Newport News (PHF)	AEA	2003			1		1	2	0.98	1
		2004					1	1	0.43	
		2005								1
		2006								
Norfolk International Airport, Norfolk (ORF)	AEA	2003								1
		2004								1
		2005				1		1	0.81	1
		2006								
Richmond International Airport, Richmond (RIC)	AEA	2003								3
		2004								1
		2005								
		2006								
Roanoke Regional/Woodrum Field, Roanoke (ROA)	AEA	2003								1
		2004								
		2005								
		2006								
Washington Dulles International, Dulles (IAD)	AEA	2003				3		3	0.81	
		2004				1	2	3	0.68	1
		2005					2	2	0.34	1
		2006								2

WASHINGTON

Airport, City (Airport Code)	Region	Fiscal Year	Severity					Total RIs	Annual RI Rate	Total SIs
			Collision	A	B	C	D			
Bellingham International Airport, Bellingham (BLI)	ANM	2003								
		2004								
		2005								
		2006					1	1	1.33	
Boeing Field/King County International Airport, Seattle (BFI)	ANM	2003				2	2	4	1.31	2
		2004				1		1	0.33	
		2005		1			2	3	1.01	4
		2006								1

WASHINGTON – Continued

Airport, City (Airport Code)	Region	Fiscal Year	Severity					Total RIs	Annual RI Rate	Total SIs
			Collision	A	B	C	D			
Felts Field, Spokane (SFF)	ANM	2003								
		2004								
		2005								1
		2006			1			1	1.53	1
Grant County International Airport, Moses Lake (MWH)	ANM	2003								1
		2004								
		2005								
		2006								2
Renton Municipal Airport, Renton (RNT)	ANM	2003					1	1	1.04	
		2004								2
		2005								
		2006								
Seattle-Tacoma International Airport, Seattle (SEA)	ANM	2003								5
		2004					2	2	0.56	3
		2005				1		1	0.29	1
		2006					2	2	0.59	3
Snohomish County Paine Field, Everett (PAE)	ANM	2003								1
		2004								2
		2005								3
		2006					1	1	0.70	1
Spokane International Airport, Spokane (GEG)	ANM	2003					1	1	0.93	2
		2004								
		2005								
		2006								
Tri-Cities Airport, Pasco (PSC)	ANM	2003				1		1	1.08	
		2004								
		2005								
		2006					1	1	1.66	1
Yakima Air Terminal/McAllister Field, Yakima (YKM)	ANM	2003								1
		2004								2
		2005								2
		2006								

WEST VIRGINIA

Airport, City (Airport Code)	Region	Fiscal Year	Severity					Total RIs	Annual RI Rate	Total SIs
			Collision	A	B	C	D			
Benedum Airport, Clarksburg (CKB)	AEA	2003								1
		2004								1
		2005								
		2006								
Tri-State/Milton J. Ferguson Field, Huntington (HTS)	AEA	2003								1
		2004								
		2005								
		2006								
Yeager Airport, Charlston (CRW)	AEA	2003								3
		2004								
		2005								
		2006								

WISCONSIN

Airport, City (Airport Code)	Region	Fiscal Year	Severity					Total RIs	Annual RI Rate	Total SIs
			Collision	A	B	C	D			
Austin Straubel International Airport, Green Bay (GRB)	AGL	2003								
		2004								1
		2005								1
		2006								
Dane County Regional-Truax Field, Madison (MSN)	AGL	2003			1	2		3	2.33	1
		2004			1			1	0.74	3
		2005				1		1	0.84	1
		2006					1	1	0.88	1
General Mitchell International Airport, Milwaukee (MKE)	AGL	2003				1	3	4	1.89	4
		2004					3	3	1.41	
		2005				1	1	2	0.91	3
		2006					3	3	1.46	15
Kenosha Regional Airport, Kenosha (ENW)	AGL	2003								
		2004								
		2005								1
		2006								
La Crosse Municipal Airport, La Crosse (LSE)	AGL	2003								
		2004								
		2005								1
		2006								
Outagamie County Airport, Appleton (ATW)	AGL	2003								
		2004					1	1	1.93	
		2005								1
		2006								4

WISCONSIN – Continued

Airport, City (Airport Code)	Region	Fiscal Year	Severity					Total RIs	Annual RI Rate	Total SIs
			Collision	A	B	C	D			
Southern Wisconsin Regional Airport, Janesville (JVL)	AGL	2003				1		1	1.32	2
		2004								
		2005								
		2006					3	3	5.46	
Waukesha County Airport, Waukesha (UES)	AGL	2003								
		2004					2	2	2.22	
		2005								
		2006								
Wittman Regional, Oshkosh (OSH)	AGL	2003	1					1	0.91	1
		2004				1	1	2	1.88	1
		2005								
		2006					1	1	1.09	1

WYOMING

Airport, City (Airport Code)	Region	Fiscal Year	Severity					Total RIs	Annual RI Rate	Total SIs
			Collision	A	B	C	D			
Cheyenne Airport, Cheyenne (CYS)	ANM	2003								
		2004								
		2005								1
		2006								
Jackson Hole Airport, Jackson Hole (JAC)	ANM	2003								4
		2004		1				1	3.19	3
		2005								3
		2006								
Natrona County International Airport, Casper (CPR)	ANM	2003								
		2004								
		2005								
		2006								1

Federal Aviation Administration
800 Independence Avenue SW
Washington, DC 20591

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