U.S. Department of Transportation
Federal Aviation Administration

Runway Safety Report 2011 – 2012

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Introduction

Safety is the Federal Aviation Administration's number one priority. With our comprehensive Safety Management System (SMS), we now anticipate and correct risks before they jeopardize safety. By bringing attention to the potential hazards associated with the presence of aircraft, vehicles, and pedestrians in the runway surface environment, the FAA proactively improves flight safety.

Our SMS provides us with a wealth of information, which, when compiled and analyzed, can give us a more panoramic view of our system, using a wider variety of data and a more holistic view of all the factors that contribute to safety. By blending the strength of our people, new technology, and enhanced analysis and procedures, we are seeing continued improvements in safety.

There are four key elements to our safety strategy: collect and value information from our front line employees; deploy technology to gather relevant data; analyze and identify risk; and, finally, take corrective action that removes risk from the National Airspace System (NAS).

Runway safety is everyone's business. The Runway Safety Group works with airlines, industry, pilot groups, and FAA lines of business to mitigate serious hazards on the runway. Working with all stakeholders, the FAA has developed innovative programs and techniques to reduce the number and severity of surface incidents, including implementing the international standard phraseology "line up and wait" and requiring explicit taxi instructions for runway crossings.

The FAA conducts Runway Safety Action Team meetings at every towered airport in the country. In April 2010, we created the FAA's Airport Construction Advisory Council (ACAC) to increase awareness of closures and construction at various airports across the nation. Risk analysis greatly improves when stakeholders constantly focus on the runway environment.

Our efforts also include comprehensive outreach, education, and training. These initiatives focus on keeping surface safety awareness at the highest possible levels among pilots, controllers, and vehicle drivers.

This Runway Safety Report provides an overview of FY 2011 and FY 2012. It offers a comprehensive accounting of the accomplishments within the FAA, which is reflected in the associated runway safety metrics contained in this report. A review of the historic data highlights the significant progress made by the FAA in improving airport surface safety. We are fully aware that there will continually be new challenges to address.

We are proud of our accomplishments to date, and remain committed to lead the effort to reduce risk associated with runway operations within the NAS. We will continue to work with our partners to develop new and innovative ways to improve runway safety in an ever-changing environment.

Joseph Teixeira
Vice President, Safety and Technical Training
Air Traffic Organization, Federal Aviation Administration

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FLIGHT DECK

SECTION 1: Runway Safety Data

The FAA collects data on runway incursions through electronic systems and reporting programs as a primary step of its runway safety program. Airports in the United States with air traffic control services are required to report any incident that occurs on the surface of a runway environment, runway safety area (RSA), or on any other airport movement area.

New automated recording and reporting systems are making those records more and more accurate. Voluntary safety reporting programs for pilots and air traffic controllers are providing insight into the reasons why the incidents occur. The FAA reviews all of these incidents and identifies a subset as surface events, most of which are runway incursions.

What is a Runway Incursion?[1]

- Any occurrence at an aerodrome involving the incorrect presence of an aircraft, vehicle, or person on the protected area of a surface designated for the landing and takeoff of aircraft.[2]

On October 1, 2007, the start of FAA's fiscal 2008, the FAA adopted standard definitions from the International Civil Aviation Organization (ICAO) for runway incursions and runway incursion severity. Pilot deviations accounted for 63 percent of runway incursions, with the remaining 37 percent essentially split between the other two runway incursion types.

There are four severity categories of runway incursions:

- Category A is an incident in which a collision is narrowly avoided.
- Category B is 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.
- Category C is an incident characterized by ample time and/or distance to avoid a collision.
- Category D is an 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.

These 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.

Runway incursions can be further classified by type as Air Traffic Controller Operational Incidents, Pilot Deviations, or Vehicle/Pedestrian Deviations.

- Operational Incident: The action of an air traffic controller that results in less than required minimum separation between two or more aircraft or between an aircraft and obstacles (e.g., equipment, vehicles, personnel on runways) or clearing an aircraft to take off or land on a closed runway.
- Pilot Deviation: The action of a pilot that violates any Federal Aviation Regulation (e.g., a pilot crosses a runway without a clearance to do so, while en route to an airport ramp or gate).
- Vehicle/Pedestrian Deviation: Pedestrians or vehicles entering any portion of the airport movement areas (runways or taxiways) without authorization from Air Traffic Control.

[1] FAA Order 7050.1A, September 16, 2010
[2] ICAO Manual on the Prevention of Runway Incursions, Doc 9870, AN/463, First Edition – 2007

The FAA has met the established runway safety goals, as demonstrated by the measures in a recent safety performance report[3]: by 2012, reduce Category A and B runway incursions to a rate of no more than 0.395 per million operations, and maintain or improve that rate through FY 2013. In each year through FY 2012, the FAA has met or exceeded these goals.

Both total runway incursions and Category A and B runway incursions increased year over year from FY 2011 through FY 2012. This increase in the number of reported events coincides with a similar increase in the number of reported airborne operational incidents and correlates to the implementation of improved reporting systems and safety culture enhancements. We have also seen an increase in reporting from federal contract towers.

Total Runway Incursions

In FY 2012, 583 towered airports reported a total of 1,150 runway incursions, which is an increase from the 954 runway incursions in FY 2011. The increase correlates to improvements in reporting systems and several years of safety culture enhancements that encourage FAA employees to actively participate in the Air Traffic Organization's (ATO) Safety Management System. These programs are paying off, yielding nearly 10 times more data over the last three years than traditional reporting systems. With the increased reporting, we are able to identify and address safety risks more effectively and more consistently.

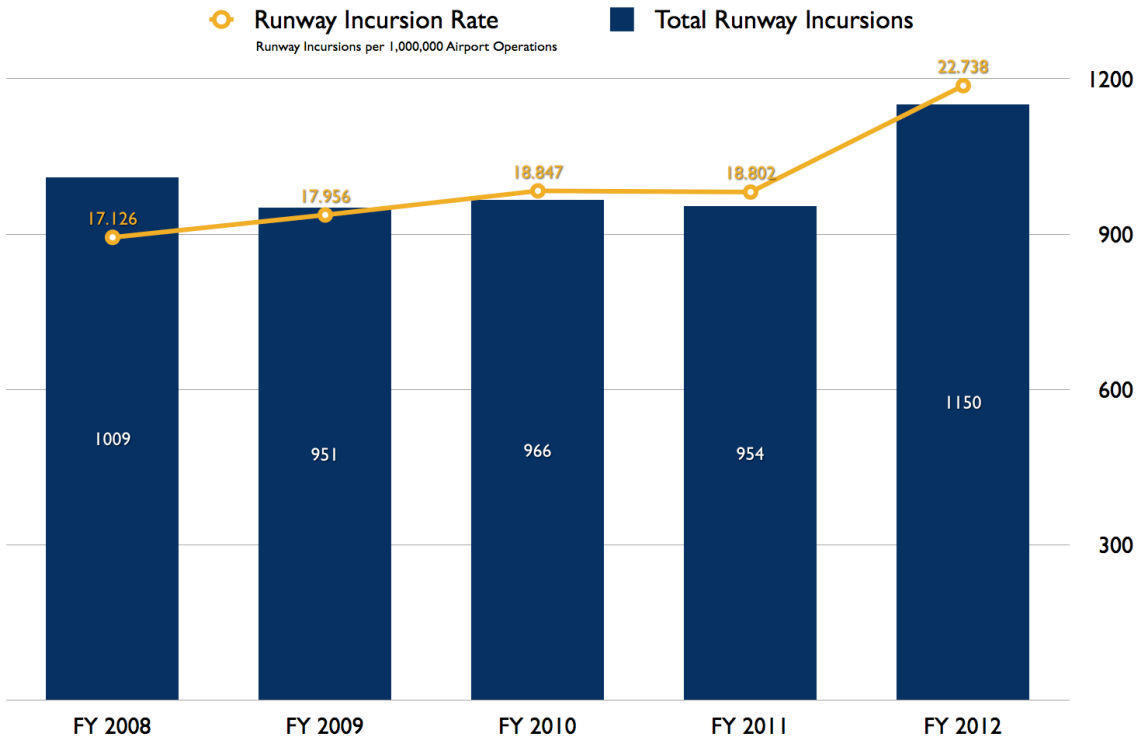


Figure 1: Number and Rate of Runway Incursions (FY 2008 – FY 2012)

[3] FAA Portfolio of Goals, FY 2011 Methodology Report, FAA Flight Plan Performance Measures

Category A and B Runway Incursions

The number and rate of Category A and B runway incursions fell between FY 2008 and FY 2010. Beginning in FY 2011 and continuing in FY 2012, the rate of Category A and B runway incursions increased slightly (see Figure 3). The majority of runway incursions in the United States continue to be Category C and D events.

The FAA has made significant strides in improving runway safety and continues to outperform FAA performance targets in this area, with fewer than 0.395 events per million operations. While the FAA tracks runway incursion counts and rates, counting numbers of incidents does not provide a complete picture of surface safety.

The FAA works with industry to use tools and techniques, such as root cause analysis, to identify hazards and develop mitigations. To enhance our ability to identify and correct hazards, the FAA is developing an improved risk analysis process. This process enhances our ability to identify causal factors associated with the more serious occurrences, and analyzed data will be used to identify specific hazards targeted for mitigation. Improved identification of areas of risk, by location, type of operations, airport configurations, etc., will enable the FAA to enact mitigations (new procedures, technology, training, etc.) in the most effective way possible.

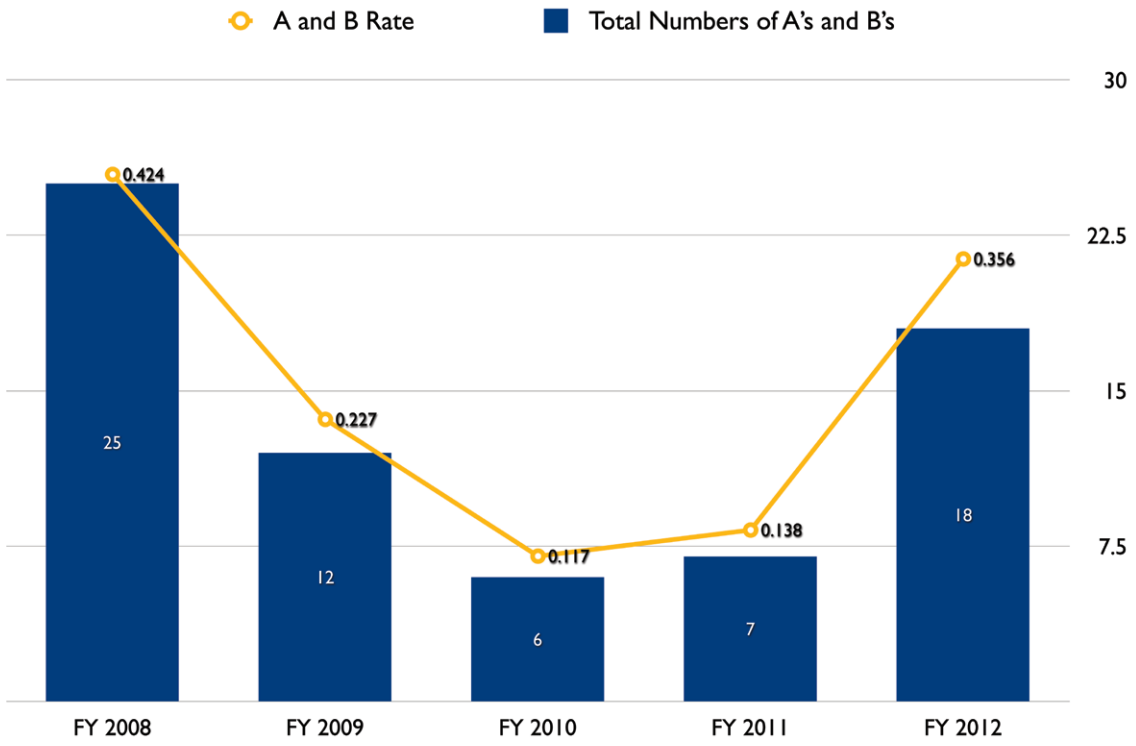


Figure 2: Number and Rate of Category A & B Runway Incursions (FY 2008 – FY 2012)

SECTION 2: Runway Safety Technological Advancements

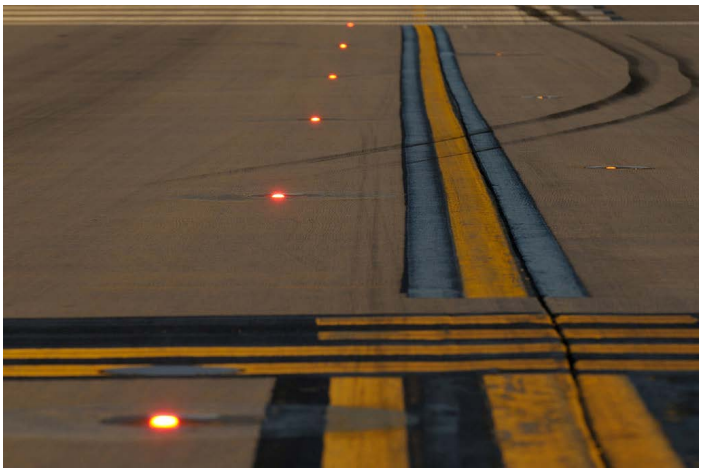
Research and development of new systems are fundamental to the enhancement of surface safety for the FAA. Evolving technology creates opportunities for the introduction of new systems targeted at mitigating specific risks. The following pages outline current initiatives under development.

Runway Status Lights (RWSL) Program

The Runway Status Lights (RWSL) System processes surveillance data using complex software algorithms with adjustable parameters to control airfield lights, which illuminate when it is unsafe for an aircraft or vehicle to enter, cross, or take off on a runway. The RWSL System activates Runway Entrance Lights (REL) and Takeoff Hold Lights (THL) in accordance with the motion and velocity of the detected traffic. In-pavement light fixtures allow the REL and THL to be directly visible to pilots and surface vehicle operators. The successful operational evaluation of prototype systems conducted at Dallas-Fort Worth International (DFW), Los Angeles International (LAX), San Diego International (SAN), and Boston/Logan International (BOS) airports resulted in the agency decision to proceed with the RWSL program at 23 airports.

RWSL Status:

- Key Site, Orlando International, (MCO), declared Initial Operating Capability on July 29, 2010
- Completed site acceptance testing at: George Bush Intercontinental/Houston (IAH), Charlotte/Douglas International (CLT) and Washington Dulles International (IAD) airports
- Completed construction/installation at: Phoenix Sky Harbor International (PHX), Las Vegas McCarran International (LAS), Seattle-Tacoma International (SEA), Fort Lauderdale-Hollywood International, and Minneapolis-St. Paul International (MSP) airports
- Construction/installation in progress at: Chicago O'Hare International (ORD), Detroit Metropolitan Wayne County (DTW), Baltimore/Washington International (BWI), and New York LaGuardia (LGA) airports

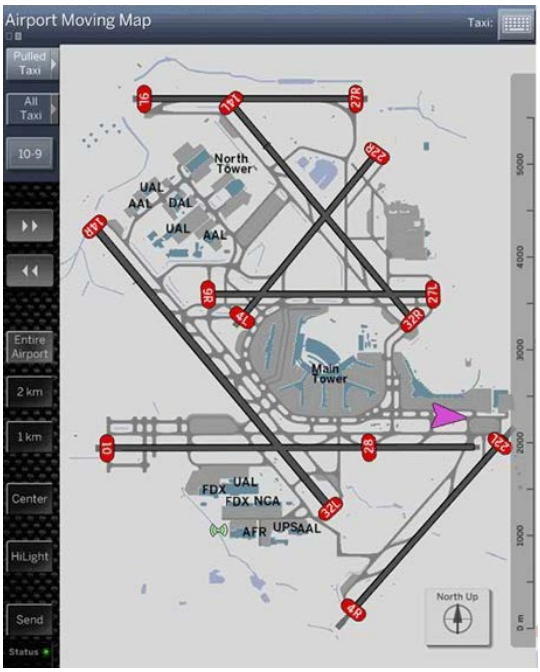


RWSL Plans for 2013

- In Service Decision expected by March 2013
- Operational Readiness Date of Key Site (MCO) following successful ISD
- Complete Operational Readiness Date at: PHX, IAH, IAD, MSP, CLT, SEA, FLL, and LAS airports
- Begin construction/installation at: Los Angeles International (LAX) airport

Electronic Flight Bag (EFB) with Moving Map Displays

The FAA reached agreement with several U.S. airlines to fund in-cockpit runway safety systems in exchange for critical operational data. With moving map displays and own-ship position systems, pilots see exactly where their aircraft is on the airfield, thus increasing situational awareness. The data collected through this program will help the FAA evaluate the safety impact of the technology and is expected to accelerate key safety capabilities necessary for the transition to the Next Generation Air Transportation System (NextGen).



The FAA has provided up to $600,000 to each participating airline to invest in surface moving maps with own-ship position on an electronic flight bag (EFB) for flights to or from 20 test bed airports. Testing and evaluation concluded at the end of FY 2011 and the FAA has approved the moving map system for use. Pilots involved in testing these systems report universal acceptance of them, and they believe these systems will increase situational awareness, thus reducing the likelihood of runway incursions in low-visibility conditions, such as darkness or heavy precipitation. This successful testing will allow pilots and airlines to implement such systems currently being developed commercially for use in several portable devices.

EFB Airports
Albuquerque International Sunport (NM)
Boston Logan International Airport (MA)
Chicago O'Hare International Airport (IL)
Cleveland Hopkins International Airport (OH)
Dallas-Fort Worth International Airport (TX)
Daytona Beach International Airport (FL)
Fort Lauderdale International Airport (FL)
George Bush Intercontinental Airport (TX)
Hartsfield-Jackson Atlanta International Airport (GA)
John F. Kennedy International Airport (NY)
LaGuardia Airport (NY)
Las Vegas McCarran International Airport (NV)
Los Angeles International Airport (CA)
Miami International Airport (FL)
Newark Liberty International Airport (NJ)
Philadelphia International Airport (PA)
Phoenix Sky Harbor International Airport (AZ)
San Francisco International Airport (CA)
Seattle-Tacoma International Airport (WA)
Ted Stevens Anchorage International Airport (AK)

Table 1: The 20 Test Bed EFB Airports

Final Approach Runway Occupancy Signal (FAROS)

Like RWSL, Final Approach Runway Occupancy Signals (FAROS) are designed to provide a visual alert of runway status to pilots intending to use a runway. FAROS provide arriving aircraft approaching an occupied runway with an indication by flashing the Precision Approach Path Indicator (PAPI) lights. As with RWSL, the system derives traffic information from approach and surface surveillance systems and uses safety logic to activate the indication signal (flashing the PAPI) when appropriate.

Low-cost FAROS that use magnetic loops in the pavement to detect runway occupancy were successfully tested at Long Beach, California. The FAA is currently working to publish an Advisory Circular (AC) for this system.

The enhanced Final Approach Runway Occupancy Signals (eFAROS) system is driven by surveillance information obtained from the Airport Surface Detection Equipment — Model X (ASDE-X). The eFAROS computer processes this information and uses it to detect possible conflicts between an arriving aircraft and other surface traffic on or near the runways. When the safety logic in the eFAROS computer determines that a runway is unsafe for landing, it commands the PAPI to flash, thus providing a direct visual warning to flight crews on final approach that a runway is occupied. To date, eFAROS at DFW are performing properly, providing an extra layer of safety while not affecting the efficient flow of air traffic at the high-density facility.

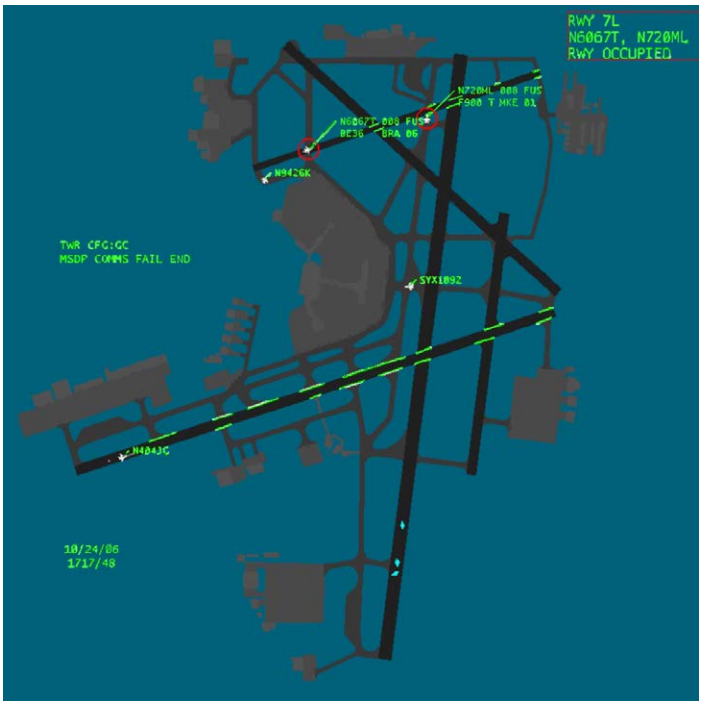
The FAA is planning on installing and evaluating eFAROS at BOS, due in part to RWSL already being installed, as well as the need to evaluate the system with a different approach environment (with intersecting runways versus parallel runways such as those at DFW).

Airport Surface Detection Equipment — Model X (ASDE-X)

Airport Surface Detection Equipment — Model X (ASDE-X) provides surface surveillance to controllers by using radar and multilateration to detect aircraft and vehicles on the airport surface. It provides digital color map displays for visual and audio alerting and uses safety logic to prevent collisions within the runway environment. ASDE-X has been successfully deployed to 35 airports (see Table 2).

ASDE-X Deployment Sites	
ATL (Atlanta, GA)	LGA (New York, NY)
BDL (Hartford, CT)	MCO (Orlando, FL)
BOS (Boston, MA)	MDW (Chicago, IL)
BWI (Baltimore, MD)	MEM (Memphis, TN)
CLT (Charlotte, NC)	MKE (Milwaukee, WI)
DCA (Arlington, VA)	MIA (Miami, FL)
DEN (Denver, CO)	MSP (Minneapolis, MN)
DFW (Dallas, TX)	ORD (Chicago, IL)
DTW (Detroit, MI)	PHL (Philadelphia, PA)
EWR (Newark, NJ)	PHX (Phoenix, AZ)
FLL (Ft. Lauderdale, FL)	PVD (Providence, RI)
HOU (Houston, TX)	SAN (San Diego, CA)
HNL (Honolulu, HI)	SDF (Louisville, KY)
IAD (Chantilly, VA)	SEA (Seattle, WA)
IAH (Houston, TX)	SLC (Salt Lake City, UT)
JFK (New York, NY)	SNA (Orange County, CA)
LAS (Las Vegas, NV)	STL (St. Louis, MO)
LAX (Los Angeles, CA)	

Table 2: ASDE-X Deployment Status



A screen shot from the ASDE-X display monitor in Milwaukee

This system will integrate with future components of NexGen, such as Automated Dependent Surveillance–Broadcast (ADS-B), which can be incorporated into the ASDE-X display.

Low Cost Ground Surveillance (LCGS) Program

The FAA awarded four pilot program contracts for testing using Surface Movement Radar. Test and evaluation will be completed in the first quarter of 2013.

Surface surveillance systems enhance airport safety by providing air traffic controllers with surface movement information during low-visibility conditions, resulting in improved information about aircraft movements on the ground. The FAA has been working on lower cost alternatives to systems such as ASDE-X, and has launched the Low Cost Ground Surveillance (LCGS) Program as a solution.

The project team identified four small or medium airports where candidate LCGS radar systems are installed: Long Beach Airport, Manchester-Boston Regional Airport, Reno-Tahoe International Airport, and San Jose International Airport. Spokane International Airport is the prototype baseline for the LCGS Program.

Each system is undergoing user evaluation, testing, and data collection, after which the results will be reported. Results of the evaluations will be used by the FAA to develop a surface surveillance strategy for airports beyond those currently equipped.

LCGS Pilot Evaluation Site
Long Beach Airport (Long Beach, CA)
Manchester Boston Regional Airport (Manchester, NH)
Reno/Tahoe International Airport (Reno, NV)
San Jose International Airport (San Jose, CA
Spokane International Airport (Spokane, WA)

Table 3: Low-Cost Ground Surveillance (LCGS) System Installation & Targets

Engineered Materials Arrestor System (EMAS)

The FAA, in partnership with industry and airport operators, conducted research to develop a soft-ground arrestor system to quickly stop aircraft that overrun the end of a runway. Based on that research, the FAA issued a specification for the Engineered Materials Arrestor System (EMAS). An EMAS bed provides a safety enhancement on runway ends where there is not enough level, cleared land for a standard runway safety area.

An EMAS is a bed of engineered materials built at the end of a runway. Engineered materials are defined as "high energy absorbing materials of selected strength, which will reliably and predictably crush under the weight of an aircraft." While the current technology involves lightweight, crushable concrete blocks, there is no regulatory requirement that this material be used for EMAS.

The purpose of an EMAS is to stop an aircraft overrun with no human injury and minimal aircraft damage (usually none). The loss of energy required to crush the EMAS material slows the aircraft. An EMAS is similar in concept to a runaway truck ramp made of gravel or sand. It is intended to stop aircraft that have overshot a runway when there is an insufficient free space for a standard RSA. Multiple patents have been issued on the construction and design on the materials and process.

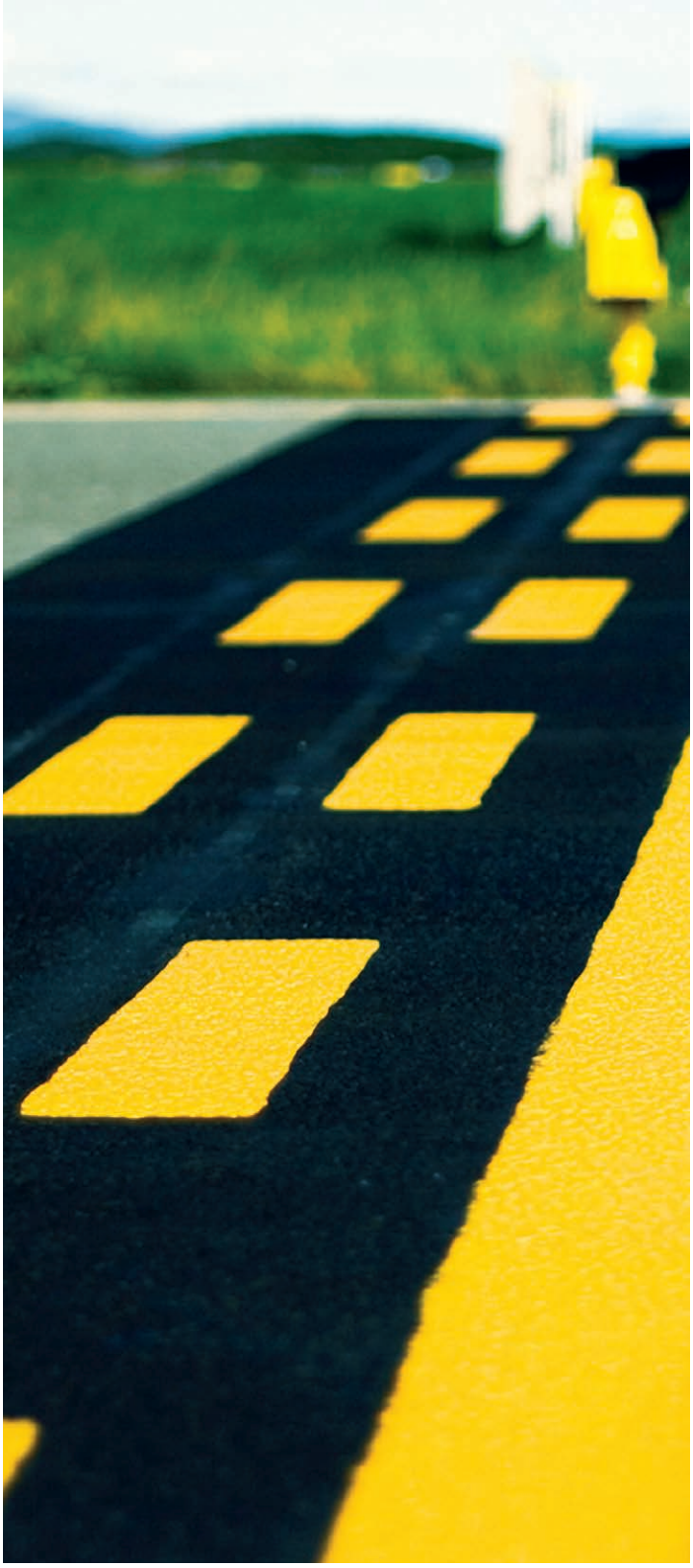
To date, EMAS has a 100 percent success rate. Currently, an EMAS is installed at 64 runway ends at 43 airports in the United States with plans to install four additional EMAS systems at three U.S. airports. As of October 8, 2010, the EMAS installed at New York City's John F. Kennedy International Airport had successfully stopped three aircraft, including a Boeing 747. On October 1, 2010, a private Gulfstream IV jet overshot the runway at Teterboro Airport in New Jersey and was safely stopped by the EMAS installation. On January 19, 2010, a US Airways Express 50-seat CRJ-200 rejected a high-speed takeoff attempt at Yeager Airport in Charleston, West Virginia. When the aircraft was unable to stop on the runway surface, the EMAS safely halted it. And in November 2011, a Cessna Citation II was involved in an overrun at the Key West, Florida, International Airport runway and was safely captured by the EMAS bed beyond the end of the runway threshold.

Photograph of a successful EMAS "capture" of a Candair Regional Jet on January 19, 2010 in Charleston, West Virginia.

Airport Signs, Marking, and Lighting

The FAA updated standards for runway marking and signs, eliminating confusion on airfields. Some of those updates include:

- Changing the airfield markings (paint) standard for taxiway centerlines at all certificated airports to require new markings that will alert pilots when they are approaching hold short lines.
- Working with airport operators to install stop bars at certain runway/taxiway intersections. A stop bar is a series of in-pavement and elevated red lights that indicate to pilots that they may not cross.
- Recommending that airports improve how they provide information (i.e., furnish airlines and pilots with diagrams giving the latest information) on rapidly changing runway and taxiway construction and closings. These could be distributed by email, on a website or hand-delivered, and would supplement Notices to Airmen (NOTAMS), which are printed as text or delivered verbally, and thus do not have diagrams.
- Requiring airports with Surface Movement Guidance and Control System (SMGCS) lighting system requires a low visibility taxi plan for many airports that have scheduled air carrier takeoff or landing operations, whenever conditions are such that 1,200 feet runway visual range (RVR) visibility exists, and the airport is SMGCS-equipped. This plan affects both aircrew and vehicle operators. Taxi routes to and from the SMGCS runway must be designated and displayed on a SMGCS Low Visibility Taxi Route chart.



Runway Safety Research

The Airport Technology Research Program encompasses a very diverse portfolio of airport safety-related programs that include visual guidance, airport capacity, airport design, surface traction and wildlife and foreign-object-debris hazards, as well as aircraft rescue and firefighting. Current research includes work on several runway safety subject areas covered in various sections of this report such as wildlife hazards, EMAS, and Low-Cost Surface Surveillance (LCSS). In wildlife hazards, research focuses on the assessment of detection systems and their integration into airport operations and the air traffic control environment. Research establishing methods for marking EMAS beds to reduce inadvertent entrance by ground vehicles and taxiing aircraft continues. Finally, the LCSS research effort is aimed at developing a low-cost, comprehensive solution to airport surface surveillance in the non-movement area encompassing aircraft, vehicle, and human traffic.

The FAA continually promotes investigations on ways to mitigate runway safety risks. These efforts take place both in-house and in partnership with external organizations such as the University of Virginia (UVA) Center for Risk Management, MITRE Corporation (a not-for-profit organization which manages federally funded research and development), the U.S. Department of Transportation's Volpe Center (which leads human factors research), and other groups located both in the United States and abroad.

Some examples of research currently under way include MITRE's work under the Air Traffic Safety Analysis contract on an update to EUROCONTROL's Risk Analysis Process tool for application to the NAS, with results completed in September 2012. The tool would be used to assess runway incursion event risk with the employment of severity and frequency parameters.

UVA is working on prioritization criteria algorithm development for the selection of locations for the Runway Safety Action Team (RSAT) activities. The various research approaches are:

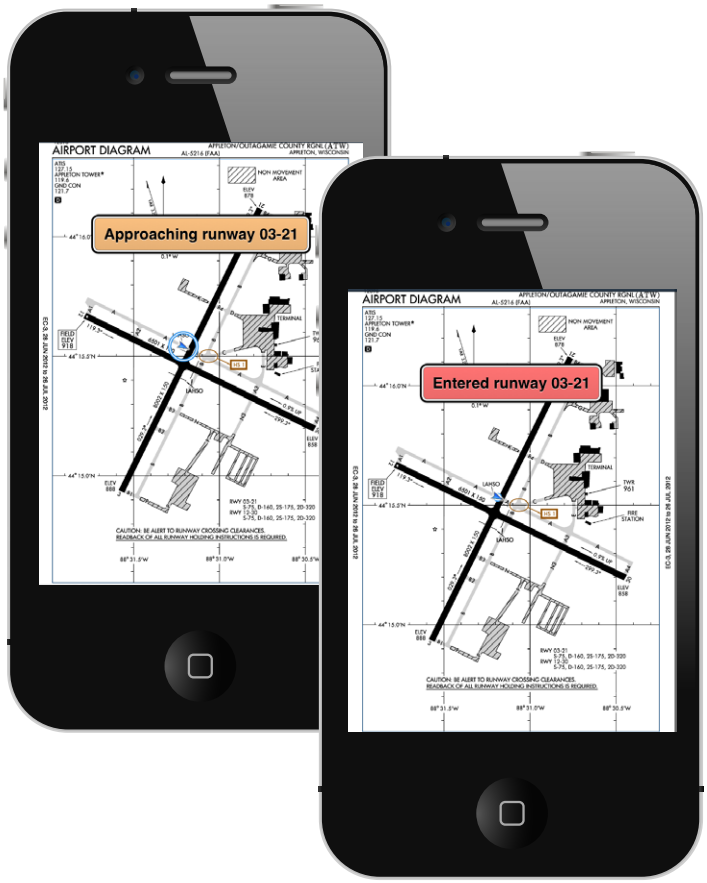
- Clustering and statistical analysis of runway incursions observational data
- Multi-criteria-based expert elicitation of factors contributing to runway incursions
- Risk-based tradeoff analysis for RSAT program integration, with the quantification of benefits of the program

UVA has developed RSAT location prioritization worksheets for all nine runway safety regions and also for the entire NAS, considering factors such as airport geography, airport geometry, runway incursion severity and frequency, and airport operations. Each worksheet ranks the airports in the order of priority for conducting an RSAT activity.

The Netherlands' National Research Laboratory (NLR) is also conducting research to explore methods of measuring and determining risk from specific scenarios versus past events. Some of these studies will bear fruit and lead to improvements in addressing surface safety's various facets and challenges.

The FAA examined a MITRE iPhone application for general aviation (GA) pilots that captured hold short, cleared to cross, and departure runway instructions manually or via speech recognition. The app then tracked the iPhone's — and therefore the aircraft's — movements across the surface and reminded the pilot of those clearances if it appeared the pilot was not going to comply. As a result of the FAA-sponsored research with MITRE, commercial vendors have developed runway safety applications, such as ForeFlight's Runway Proximity Advisor.

The objective was to reduce GA incursions by targeting their causes and to mitigate cost as an obstacle to GA adoption. Private industry has integrated this technology concept into aviation software products, as shown below.



iPhone app for pilots that tracks aircraft movement and offers runway instruction.

MITRE is developing a Closed Runway Operation Prevention Device (CROPD), which is a proposed voice recognition-based system still in the concept phase, designed to send an alert if a controller issues a clearance authorizing an aircraft to use a runway designated as closed.

CROPD is envisioned to have three components:

- A selector panel using switches (or buttons) to select the specific closed runway
- An alert panel to display a visual alarm and a speaker for an audible alarm
- A voice recognition unit (VRU) to monitor controller transmissions and detect clearances authorizing the use of the closed runway

When a runway has been selected as closed, the VRU will analyze controller communications for one of the following instructions:

- Runway (XX), cleared to land
- Runway (XX), cleared for takeoff
- Runway (XX), cleared touch and go/stop and go
- Runway (XX), line up and wait

If the VRU detects any of these communications, the alert panel will immediately activate.

NextGen and Runway Safety

NextGen is a comprehensive overhaul of the NAS to provide increased capacity and better operational performance that will reduce congestion, meet projected demand, and be environmentally sound. In a continuous rollout of improvements and upgrades, the FAA is building the capability to safely guide and track air traffic more precisely and efficiently, in turn providing multiple benefits to passengers and operators.

NextGen is a necessary evolution in the air transportation system in the U.S. (see Table 4). Traffic is forecast to increase steadily over the coming decades.

NextGen will make travel more predictable and efficient. For passengers, this will translate to dependable, safe, and secure air travel in all of its phases. For operators, this will translate to more optimized flight operations with improved predictability, reduced carbon footprint, fewer delays, and lower cost.

In addition to these gains in operational efficiencies, NextGen will help prevent surface and airborne incidents because advanced safety management features will enable the FAA, with other government agencies and aviation partners, to better predict and identify risks and resolve hazards.

Transformation of the US Air Transportation System		
Today's National Airspace System	→	NextGen
Ground-based navigation and surveillance	→	Satellite-based navigation and surveillance
Air Traffic Control communications by voice	→	Routine information sent digitally
Disconnected information systems	→	Information more readily available
Cognitive-based air traffic "control"	→	Decision support tools
Fragmented weather forecasting	→	Forecasts embedded into decisions
Airport operations limited by visibility	→	Operations continue into lower visibility
Forensic safety systems	→	Prognostic safety systems
Focus on major airports	→	Focus on metropolitan areas
Inefficient route and fuel consumption	→	Short flight paths, fuel saving procedures, alternate fuels, reduced noise and emissions

Table 4: Transformation of Today's National Airspace System through NextGen

Improved Runway Safety Situational Awareness for Pilots and Controllers

Enhanced surface displays, which alert controllers when a runway incursion is imminent and provide pilots greater awareness of their location on the airport surface, will be developed to improve runway safety. Both ground-based (i.e., RWSL) and cockpit-based (i.e., EFBs) runway incursion alerting capabilities will be available to alert pilots when it is unsafe to enter the runway.

Initial Surface Traffic Management

FAA automated decision-support tools will use departure-scheduling algorithms to manage the flow of surface traffic at high-density airports. These tools will integrate surveillance data that include weather, departure queues, aircraft flight plan information, runway configuration, expected departure times, and gate assignments. The tools also will provide controllers with surface sequencing and staging lists for departures, along with average departure delays (both current and predicted).

Enhanced Surface Traffic Operations

Data communication between aircraft and controllers will be used to transmit automated airport information, exchange clearances and instructions, including hold-short instructions. At specified airports, the use of Data Communications will provide the augmented means of communication between controllers and equipped aircraft. Data communication functions will reduce frequency congestion on the radio, ensuring the successful transmission of more important communications that can provide a safe runway environment.

NextGen and Runway Safety, Beyond the Mid-Term (2018+)

Long-term NextGen capabilities require continued research into surface situational awareness, taxi route generation and assignment, conformance monitoring, conflict detection, and conflict resolution. Because of the complexity of the NextGen program and the required interdependencies of various technologies, research has already started on many of the improvements that will not mature until after the mid-term period.

Descriptions, below, of NextGen capabilities "Full Surface Traffic Management with Conformance Monitoring" and "Full Surface Situation Information" were extracted from the current FAA NAS architecture and have been selected based on their relevance to runway safety.

Full Surface Traffic Management with Conformance Monitoring

Using improved surveillance, communication, and automation will increase safety and efficiency of surface traffic management. Properly equipped aircraft and ground vehicles will be provided with surface traffic information in real time. Airports and air traffic control centers will be able to view traffic flows and project demand; predict, plan, and manage surface movements; and balance runway assignments. Automated systems will monitor surface operations and update estimated departure clearance times. Surface optimization automation includes activities such as runway configuration and runway snow removal.

Full Surface Situation Information (SSI)

Automated broadcasting of aircraft and vehicle position to ground and aircraft sensors/receivers will provide a digital display of the airport environment and traffic to pilots, controllers, vehicle operators, and flight operations centers. Surface situation information (SSI) will complement visual observations of the airport surface by alerting pilots, controllers, and vehicle operators of a possible runway incursion before it happens.

SECTION 3: Improved Analysis

Constantly reducing the likelihood of airplanes colliding with obstructions on airport runways — whether they are other aircraft, vehicles, individuals, or wildlife — is the primary objective of the Runway Safety Group. To accomplish this, we must focus our limited resources on the causal factors with the highest risk of contributing to the likelihood of significant safety events.

We use Safety Risk Management (SRM) to identify, quantify, and mitigate the most significant risk factors in order to reach safety goals. By reducing the likelihood of contributing causal factors, we can continue to reduce the likelihood of dangerous events.

Runway Safety Council

Formed in October 2008, the Runway Safety Council is a joint effort between the FAA and the private aviation industry to look into the root causes of runway incursions. The council is composed of representatives from various aviation industry stakeholders such as labor groups, the Aircraft Owners and Pilots Association (AOPA), the Air Line Pilots Association (ALPA), and Airlines for America as well as other industry groups.

A working group called the Root Cause Analysis Team (RCAT) integrates investigations of severe runway incursions and conducts root-cause analysis. The working group presents its work to the full council and makes recommendations on ways to improve runway safety.

If the recommendations are accepted, they are assigned to the FAA and/or industry group best able to address the identified root causes and reduce the incidence of runway incursions. The council tracks recommendations to make sure appropriate action is taken.

Runway Incursion Assessment Teams

The Runway Incursion Assessment Team (RIAT), composed of one representative each from the Office of Airports (ARP), Flight Standards Service (AFS), and ATO Terminal Services (AJT), meets weekly to assess the severity of each runway incursion event. RIAT members discuss the relevant details and rate each according to the severity guidelines contained in FAA Order 7050.1A. Each RIAT member provides a voice vote on event severity and, if a consensus is reached, the final severity is recorded in the Runway Safety Database.

Runway Safety Action Team

Chartered by FAA Order 7050.1A, Runway Safety Action Teams (RSATs) convene to discuss surface movement issues and concerns at particular airports, and then formulate Runway Safety Action Plans (RSAPs) to address the issues raised at those airports. The team includes personnel from the local airport traffic control tower (ATCT), airport management, tenants, other FAA lines of business, and any interested users of the airport.

There are two types of RSATs: regional led by the Runway Safety Group and local led by the ATCT manager. The nine regional runway safety program offices conduct dozens of these meetings across the nation annually to identify and address local problems.

Regional RSAT Meetings

Regional RSAT meeting attendees include airport management, air traffic controllers, airport tenants, airlines and charter companies, fixed-base operators, corporate flight departments, military units, GA pilots, airport certification inspectors, and other stakeholder entities. RSATs have proven successful for:

- Increasing surface safety awareness throughout the aviation community
- Identifying and analyzing hazards associated with surface operations
- Identifying and developing mitigations to help reduce risk
- Fostering communications and building relationships within the local airport/aviation community
- Increasing media advocacy of runway safety at a local level

Local RSAT Meetings

Local RSAT meetings operate just like Regional RSAT meetings, but focus on localized issues. Meetings include:

- Local Technical Operations (Tech Ops) personnel
- Airport tenants and other users
- Any organizations that have drivers who operate on the airport operations area
- Regional Runway Safety Program Offices
- Airport District Offices
- Flight Standards District Office (FSDO)
- FAA Safety Teams (FAAST)

Local RSAT meetings are organized and conducted by air traffic facilities and supported by Runway Safety regional offices.

Local Runway Safety Action Team (LRSAT) Toolkit

The LRSAT toolkit, downloadable from the Runway Safety Web page, created in FY 2011, provides supplemental guidance to air traffic managers on how to plan and conduct effective LRSAT meetings, as well as how to develop and update RSAPs. The toolkit also provides directives, contacts, templates, examples, and other resources to facilitate more productive and effective meetings.

Airport Construction Advisory Council

Construction on an airport, particularly within the movement area, creates a number of challenges. Taxiways are blocked. Runways close or their thresholds are potentially relocated. Takeoff and landing distances change dramatically. Taxi routes change abruptly and unexpectedly.

The FAA created the Airport Construction Advisory Council (ACAC), a volunteer group of air traffic managers throughout the United States, to address these hazards. The ACAC has undertaken the formidable task of identifying potential dangerous situations during airport construction projects and implementing ways to mitigate accompanying risks significantly. Additionally, the ACAC initiated collaboration with the Surface Operations Office to improve visibility and accurate posting of nationwide capacity limits imposed by construction. The ACAC also collaborates with the Terminal Simulation System Program office to ensure that visual database changes are available to support airport configuration changes following construction.

For example, the ACAC identified shortcomings such as misleading, untimely, or inaccurate information broadcast during construction on an airport's Automatic Terminal Information Service (ATIS) and incorrect information on an airport diagram. The council also found pilot and controller confusion about what the term "full length" means when applied to a runway with ongoing construction and other human factors challenges in this dynamic environment.

Among the ACAC's initiatives and accomplishments was an amendment to the Air Traffic Controller Handbook to clarify phraseology and to eliminate the term "full length" from clearances. The group has reworked the ATIS processes to engage the council in the formulation and prioritization of ATIS messages. Additionally, the ACAC has developed a Runway Construction Safety website, a compilation of best practices and a runway construction checklist (www.faa.gov/go/runwayconstruction). The ACAC responded to facility requests to improve the usability of the

construction checklist by making it fillable throughout its life, resulting in a much improved tool.

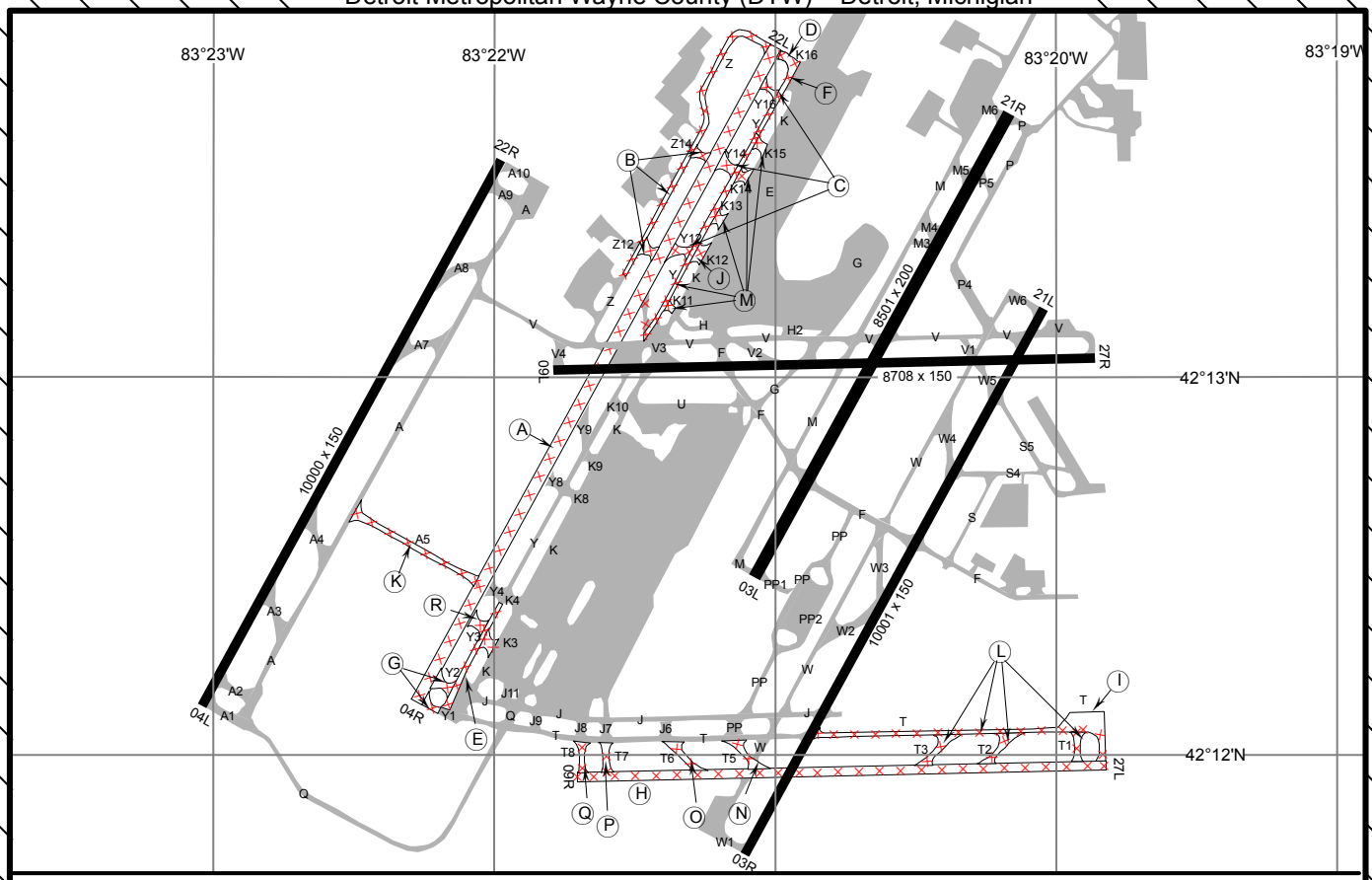
While runway decommissioning rarely happens, the ACAC helped coordinate appropriate NOTAMs and publication changes to ensure safe surface operations during FY 2012. The ACAC also collaborates with the Aeronautical Information Management Office to improve the timely distribution of digital information, including accelerated fielding of the NOTAM Manager segment of the Federal NOTAM System. Further, the ACAC directly collaborates with Mission Support Services to clarify the actions that trigger suspension of approach/departure procedures when a runway is closed or shortened. The ACAC's initiative to demonstrate the value of Construction Notices was embraced by United Airlines, Alaska Airlines and JetBlue Airlines, and these products are commonly issued to pilots using the affected airports.

Other ACAC initiatives:

- Resulted in a research and development effort by the FAA's Airports Division to consider greater use of temporary construction signage and markings, using the color orange, during periods of airport construction.
- Helped Air Traffic facilities realize that NOTAMs did not change the negotiated movement area(s) found in their letter of agreement (LOA) with the airport authority. Changes desired because of construction require the LOA to be formally changed.
- Supported the planning and quickly responded to help arrange changes in lighting/markings and bulletins to pilots/dispatchers following confusion regarding one of the runways at San Francisco International Airport (SFO) while undertaking several surface changes that required displaced thresholds to avoid full shutdown of the affected runways.
- Expanded the support to many airports during FY 2012 by adding a manager from the Alaska District, offering Construction Notice changes on weekends when key closures/reopenings were occurring.
- Greatly expanded collaboration and communications during FY 2012 with ALPA (which in turn coordinated with the International Federation of Airline Pilots' Associations), AOPA, the Airline Dispatchers Federation,the Airports Council International-North America (ACI-NA), the American Association of Airport Executives (AAAE), EUROCONTROL, the Flight Safety Foundation (FSF), the International Civil Aviation Organization, and the French "Direction des Services de la Navigation Aérienne and Directorate General for Civil Aviation." The FSF published a cover article on the ACAC in its AeroSafety World publication.
- Collaborated with Airports Division and the Strategic Event Coordination network that includes the Operational Control Centers (OCC) to improve the transparency and accuracy of future construction project details.
- Reached out to several airports faced with significant hazards and traffic impacts related to surface limitations. North Las Vegas (VGT), Los Angeles International (LAX), Orlando-Sanford International (SFB), Juneau International (JNU), and Palm Beach International (PBI) airports all benefited from ACAC support and immediately took steps to remove hazards and mitigate risks identified by the ACAC.
- Coupled GIS data and text from active NOTAMs during an ACAC demonstration program to create two-dimensional layered Construction Notices of open and closed tarmacs at over 50 airports and more than half of the Core-30 airports, and published over 1,000 updated Construction Notices used to graphically depict closed/shortened runways the past 12 months.

CONSTRUCTION NOTICE

Detroit Metropolitan Wayne County (DTW) Detroit, Michigan



NOTAM		START DATE	FINISH DATE
A 04/357	RWY 4R/22L CLSD	APR 23, 2012	SEP 6, 2012
B 04/172	TWY Z, Z12, Z14 N OF FEDEX RAMP CLSD	APR 16, 2012	SEP 5, 2012
C 04/182	TWY Y12, Y14, Y16 CLSD	APR 19, 2012	SEP 6, 2012
D 04/183	TWY Y CLSD AT 22L APCH	APR 19, 2012	AUG 1, 2012
E 06/219	TWY Y BTN TWY Y1 AND TWY Y4 CLSD	JUN 28, 2012	JUL 3, 2012
F 04/221	TWY Y BTN TWY K15 AND APCH END RWY 22L CLSD	APR 19, 2012	SEP 5, 2012
G 06/216	TWY Y1, Y2 CLSD	JUN 28, 2012	JUL 3, 2012
H 06/066	RWY 9R/27L CLSD	JUN 11, 2012	JUN 29, 2012
I 06/070	TWY T RUNUP PAD AT APCH END RWY 27L CLSD	JUN 11, 2012	JUN 29, 2012

NOTAM		START DATE	FINISH DATE
J 04/397	TWY K12 CLSD	APR 30, 2012	AUG 1, 2012
K 05/001	TWY A5 CLSD	MAY 1, 2012	JUL 10, 2012
L 06/082	TWY T1,T2,T3,T BTN RWY 3R/21L AND APCH END 27L CLSD	JUN 11, 2012	JUN 29, 2012
M 04/398	TWY K11, K13, K14, K15, TWY Y BTN TWY V AND TWY K15 CLSD	APR 30, 2012	JUL 1, 2012
N 06/211	TWY T5 CLSD	JUN 28, 2012	JUL 7, 2012
O 06/212	TWY T6 CLSD	JUN 28, 2012	JUL 7, 2012
P 06/213	TWY T7 CLSD	JUN 28, 2012	JUL 7, 2012
Q 06/214	TWY T8 CLSD	JUN 28, 2012	JUL 7, 2012
R 06/217-218	TWY Y3,K3 CLSD	JUN 28, 2012	JUL 3, 2012

NOTE: This diagram is intended to display published NOTAMs and is checked and updated daily (Mon. - Fri. only; no holidays); temporary closures/openings of less than 24 hours are not depicted; runway length shown is maximum length (shortened distances are not depicted); diagrams containing new runway surfaces will be deleted after (FAA) revised airport diagrams are published. Always CHECK CURRENT NOTAMs

Consult NOTAMS for Latest Information

Active Construction Notice at DTW depicts the construction complexity that more than 1,300 aircrews and controllers faced on one day in 2012; 19 NOTAMs covered two runway closures and 30 associated taxiways

Construction Safety Summit

With increased focus on the hazards that construction brings, many airports have initiated Construction Safety Summits before their biggest projects begin, and airports (i.e., Chicago O'Hare) with multi-year projects are meeting throughout the project life span to find proactive approaches to the challenges of airport construction. Attendees collaborate on lessons learned and take away common pitfalls to avoid during construction projects. The ACAC has helped generate cross-organizational participation at regional and state Airports Division conferences, and at conferences of the AAAE, the ACI-NA, the FSF, and the National Business Aviation Association (NBAA) as well as national and local FAA customer forums.

Runway Safety Tracking System (RSTS)

The Runway Safety Group will pursue continued enhancement of a system of records called the Runway Safety Tracking System (RSTS). RSTS tracks runway safety program events including regional and local RSATs, a user and reference guide for RSAPs, and the actual RSAP for individual airports. Airports with an operational ATCT (including federal contract towers) are required to develop and maintain a documented RSAP. The plans are site-specific and present strategies to mitigate the risks of runway incursions. They also present best practices that can be documented and shared with the aviation community.

International Leadership in Runway Safety

The FAA contributes to multiple national and international cooperation initiatives aimed at improving aviation and runway safety. Each year, the FAA provides direct and indirect technical assistance and training to regulators and air navigation service providers in more than 100 countries, expanding the network of collaborative partners (see Figure 3).

Figure 3: FAA International Leadership in Runway Safety Partners

Participation in international aviation standards-setting committees is one of the key activities through which the FAA provides significant leadership in runway safety-related issues. Entities such as the RTCA, Inc., a federal advisory committee to the FAA, manages several committees and working groups dedicated to developing consensus-based recommendations that become technical input for FAA standards.

The Joint RTCA-European Organization for Civil Aviation Equipment special committee on terrain and airport databases will develop recommendations relevant to runway safety topics such as user requirements for aerodrome mapping databases, user requirements for terrain and obstacle databases, and terrain and aerodrome mapping database exchange standards.

Global Runway Safety Symposium

The FAA furnished the agenda and logistics support for the Global Runway Safety Symposium in Montreal in May 2011. The event highlighted the evolution toward a more integrated safety management approach in ICAO's global runway safety program. The symposium focused on:

- Coordinating a global effort for improving runway safety by identifying what a state can do to improve runway safety outcomes.
- Identifying a common framework for the enhancement of runway safety.
- Promoting and gaining commitment from partners to deliver regional runway safety workshops across the globe.
- Identifying content and format for subsequent runway safety workshops.
- Conducting unique events that bring together experts from diverse professional domains to determine a multidisciplinary approach to improving runway safety outcomes worldwide. These sectors include regulators, aircraft operators, air navigation service providers, aerodrome operators, aircraft manufacturers, and air traffic controller associations such as the National Air Traffic Controller Association (NATCA) and the International Federation of Air Traffic Controllers' Associations (IFATCA).

The first Regional Runway Safety Symposium was held October 12 – 14, 2011, in Miami. Approximately 100 participants from North, Central, and South America, as well as the Caribbean, were in attendance. The Office of Runway Safety worked closely with ICAO Montreal, ICAO Mexico City, and the FAA Western Hemisphere representative to develop the agenda, resolve logistical issues, and identify speakers, as well as provide briefings and a workshop session. The Office of Runway Safety has developed generic session templates for "Runway Safety Team" and "Role of the Regulator" briefings, which were forwarded to ICAO Montreal for inclusion in a standardized agenda template for future seminars. The Office of Runway Safety met with ICAO to develop the framework for the Runway Safety Team hands-on workshop to be given at the seminars.

Additionally, the Airports Construction Advisory Council briefed the ICAO Air Navigation Commission on March 2012, and delivered editorial changes to the ICAO advisory circular on construction in July 2012.

Close coordination with ICAO has been instrumental for the FAA in its efforts to increase global awareness of runway safety issues. As the FAA progresses toward NextGen technologies and its various runway safety initiatives, working closely with ICAO will become increasingly important as U.S. aviation intersects with global aviation on a larger scale.

ICAO Panels

The FAA supports and participates in multiple ICAO panels:

- **Aerodromes Panel:** Works to develop global consensus on runway safety-related issues such as the use of visual aids for the Advanced Surface Movement Guidance and Control System (A-SMGCS) and runway surface friction measurement and reporting for the prevention of runway incursions.
- **Operations Panel and Aeronautical Surveillance Panel:** Addresses topics that impact runway safety (e.g., developing standards and recommended practices governing the operation and use of synthetic vision systems and ADS-B).
- **Operational Data Link Panel:** Deals with runway safety-related topics, such as developing standards and recommended practices, procedures, and guidance materials to support the implementation of emerging data-link technology. Increased use of Data Communications is an essential element of the NextGen vision for runway operations.
- **Other Collaboration:** The ACAC is collaborating with ICAO on common standards found in Chapter 8 of the ICAO Services Manual for construction planning and operational limits during construction to avoid localized hazards due to operator confusion.

International Aviation Stakeholder Collaboration

Runway safety issues are addressed within the context of the FAA's overall direct collaboration with regulators such as the European Aviation Safety Authority (EASA) and Transport Canada. Organizations such as the International Air Transport Association (IATA),the ACI-NA, the, IFALPA, and the FSF also promote and support runway safety from their stakeholders' perspective. The FAA maintains an active collaborative relationship with these organizations as part of its overall international leadership efforts.

The FAA and EUROCONTROL – Collaboration on Runway Safety

The FAA and EUROCONTROL have had a memorandum of cooperation in place since 1986. This memorandum covers air traffic management (ATM) research, strategic ATM analysis, technical and operational harmonization, and the alignment of safety and environmental issues.

This cooperation with EUROCONTROL has been beneficial for both organizations and has resulted in increased information sharing and technology development. Since 2003, with participation from the FAA, EUROCONTROL has published the European Action Plan for the Prevention of Runway Incursions. Subsequently, this work was used as input to the collaboration between the FAA, EUROCONTROL, and Air Services Australia to support the production of the 2007 ICAO Manual for the Prevention of Runway Incursions.

The FAA and EUROCONTROL cooperated in developing the Integrated Risk Picture (IRP) analysis using detailed modeling of causal factors involved in incidents and accidents. This analysis is the output of a risk model for aviation accidents, with emphasis on air traffic management. IRP integrates individual safety assessments to determine the combined effects that proposed ATM improvements might have on safety.

Additionally, the ACAC continued to filter Air Traffic Safety Action Program reports for construction related lessons learned and best practices. It collaborated with EUROCONTROL and the French "Direction des Services de la Navigation Aérienne and Directorate General for Civil Aviation" to openly share construction-related lessons learned and best practices to benefit the facilities with upcoming/ongoing construction projects.

This type of collaborative development accelerates the standardization of safety improvements worldwide.

The FAA and the Commercial Aviation Safety Team (CAST)

Since 1998, the Commercial Aviation Safety Team (CAST) has successfully brought together key domestic and international stakeholders from industry and government sectors to develop and implement a prioritized safety agenda. The FAA has implemented several CAST safety enhancements, in collaboration with ICAO, regarding runway incursion prevention. They included updating air traffic control training programs, establishing standard operating procedures for ground operations, and establishing and disseminating recommended practices for ground operations for GA pilots. Similarly, the Air Traffic Control Procedures Advisory Committee (ATPAC) has been doing the same for U.S. air traffic control since 1975.

International Safety Data Sharing

The Aviation Safety Information Analysis and Sharing (ASIAS) program, another FAA-CAST initiative, produces additional direct benefits for runway safety. Under ASIAS, the FAA and the aviation community have initiated a safety analysis and data-sharing program that proactively analyzes the extensive data received from the FAA, airline safety programs, manufacturers, and others to advance aviation safety. As cited at the 2008 annual U.S./Europe International Aviation Safety Conference, ASIAS enables the aviation community to identify systemic risks and evaluate those identified risks by estimating probabilities, assessing severities, uncovering event precursors, and diagnosing event causation; formulate interventions; and monitor the effects of those interventions.

International safety data sharing efforts such as the CAST/ICAO Common Taxonomy Team (CICTT) contribute to the FAA's runway safety initiatives. CICTT includes experts from numerous areas, all tasked with developing common taxonomies and definitions for aviation accident and incident reporting systems. Common taxonomies and definitions establish an industry-standard language, thereby improving the quality of information and communication. This common language greatly enhances the aviation community's capacity to focus on common safety issues.

The FAA and Chinese Aviation Authorities

Continuing its support of international runway safety goals, the FAA is working with Chinese aviation authorities to help implement CAST safety enhancements. China implemented a runway safety program after its 2007 ICAO audit. The program is continuing to focus on airport signage and markings as well as increasing education and training objectives. The FAA and the George Bush Intercontinental/Houston Airport airport are supporting an annual training program for Chinese personnel focusing on multi-runway operations.

SECTION 4: Embracing Corrections to Mitigate Risks

Bringing all stakeholders together for the purpose of surface safety is possible by focusing on the basics. Pilots, air traffic controllers, ground crews, airport operations personnel, technicians, vehicle operators and construction crews need the ability to readily receive information about the airport surface environment where they work.

By developing runway safety training and outreach initiatives, hundreds of thousands of people working in air travel can develop good work practices for maintaining an extraordinary level of safety. Along with continued situational awareness, these practices will continue to reduce the rate and severity of runway incursions.

Runway Safety Areas (RSA)

A runway safety area (RSA) is a defined surface surrounding the runway that is prepared or suitable for reducing the risk of damage to aircraft in the event of an undershoot, overrun, or excursion from the runway. RSA dimensional standards have increased over time to improve safety. The predecessor to today's standard extended only 200 feet beyond the ends of the runway, but today, a standard RSA can be as large as 500 feet wide, extending up to 1,000 feet beyond each runway end. The FAA increased these dimensions more than 20 years ago to accommodate larger and faster aircraft and to address higher safety expectations of aviation users. Many runways do not yet meet current standards because they were designed and constructed to meet an earlier standard.

The FAA completed Airport Improvement Program (AIP) improvements at 25 RSAs in 2011, and at 74 RSAs in 2012. This brings the number of AIP improvements since 2000 to 528. Through facilities and equipment funding, the FAA is also in the process of relocating navigational aids, or making them frangible, as part of the effort of the RSA Improvement Program. At the end of FY 2012, 61 percent of the RSAs on commercial runways at Part 139 airports have been improved to the extent practicable.

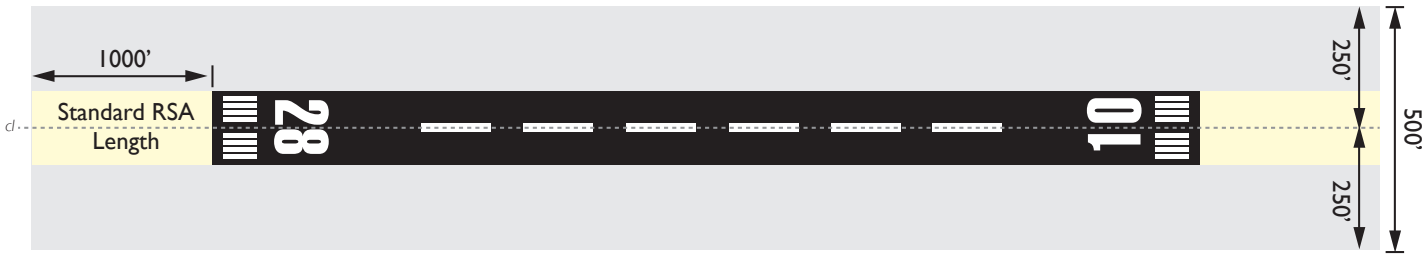


Figure 4: Example Design: Runway Safety Area

"Surface Sense" Bulletins

"Surface Sense" bulletins were developed to address various runway safety topics for tower controllers. The first edition of "Surface Sense" published in March 2011, discussed the culture of runway safety. Subsequent editions provided information on preventing closed runway operations, handling aircraft emergencies, disabled aircraft, runway light failures and pilots operating at unfamiliar airports.

For 2013, FAA Terminal Services (AJT) will continue to develop and distribute "Surface Sense" bulletins to all Terminal facilities at least quarterly.

Phraseology Changes

Differences in phraseology contribute to runway incursions. Analysis by the National Transportation Safety Board (NTSB) revealed that differences between FAA and ICAO air traffic control phraseology contribute to runway incursion risks.

The FAA adopted the international standard terminology "Line Up and Wait" to replace "Position and Hold" on June 30, 2010. The FAA expects this change to contribute to the reduction of runway incursions, particularly at high-use, congested airports frequented by foreign pilots.

In addition, on June 30, 2010, controllers began to issue explicit instructions to cross or hold short of each runway that intersects a taxi route, rather than instruct pilots to taxi to a destination runway with implied clearances to cross all intersecting runways.

All air traffic controllers have been briefed and trained on these two significant changes to air traffic procedure phraseology.

Runway Excursions

In FY 2012 the runway safety program has adapted the ICAO definition of Runway Excursion as "a veer-off or overrun off the runway surface." This change has been included in the revised Runway Safety Order 7050.1B. The Office of Runway Safety has begun compiling a database for the purpose of a comprehensive study on the root causes of runway excursions.

Air Traffic Controller Training

Crew resource management (CRM) training, initially designed for flight crew personnel, was tailored to meet air traffic controllers' specific needs. Continuing to promote an operational safety culture, the FAA gears its CRM human factors training to the operational aspects of the air traffic control team environment to make it relevant to daily operations. ATO Safety and Technical Training conducted 190 CRM workshops between FY 2010 and FY 2011.

National Air Traffic Professionalism (NATPRO) Training focused on visual sensory perception to enhance cognitive skills, situational awareness, memory, and reaction time for controllers in radar and tower facilities. All terminal facilities completed the training in 2008–2009. NATPRO II is a complementary portion of the training, targeting auditory sensory exercises. The intention of the training is to improve cognitive skills, situational awareness, memory, and reaction time, with an emphasis on improving hearback/readback skills. Radar facilities completed NATPRO II in January 2010, and tower facilities completed it in 2011.

Airport Recurrent Driver Training

Ongoing airport recurrent training for all certificated airports in the nation includes initial and recurrent driver training instruction for airport employees. As a result of the FAA's Call to Action in 2007, all certificated airports now require recurrent driver training for non-airport employees (e.g., Fixed-Base Operator personnel and technicians). The curriculum includes at least one of the following:

- Airport familiarization, including airport markings, lighting, and signs
- Procedures for safe and orderly access to, and operations in, movement areas and safety areas by pedestrians and ground vehicles, including provisions identifying the consequences of noncompliance with the procedures
- Airport communications, including radio communication between the ATC tower and personnel, and procedures for reporting unsafe airport conditions
- Duties required under the airports certification manual

- Additional subject areas such as aircraft rescue and firefighting, handling and storing of hazardous substances and materials, airport self- inspections, wildlife hazard management, or field condition reporting, as appropriate

An airport certification inspector must approve all training, and each airport must provide a syllabus in its Airport Certification Manual.

Collaboration with Flight Standards

The Office of Runway Safety collaborated with Flight Standards to enact significant policy changes. With monitoring and adjusting as necessary over the coming year, these changes will be effective in reducing and eliminating pilots as the cause of runway incursions. The changes:

- Added required Runway Incursion Avoidance Task to the Practical Test Standards (PTS).
- Created a new Runway Incursion Avoidance chapter to the Pilots Handbook of Aeronautical Knowledge (PHAK), available on the Runway Safety website.
- Created a new Runway Incursion Pilot Deviation (PD) remedial training process and standardized lesson plan.
- Provided information for certified flight instructors (CFI) to provide and designated pilot examiners (DPE) to ensure that newly certificated pilots know the best practices to avoid causing a runway incursion. The following documents are available on the FAA Regulatory Guidance Library website http://rgl.faa.gov:
  - o Updated Advisory Circulars (AC) 91-73 and AC 120-74
  - o Runway Incursion Avoidance Safety Alert for Operators (SAFO) Notice 8900.Run2
- Increased Flight Standards collaboration with the Office of Runway Safety in initial and recurrent DPE training.

Airline Pilot Training

Most airlines incorporate real-world runway incursions into their pilot curriculums.

Working with the FAA, airlines have constructed scenarios from actual runway incursions to emphasize the importance of runway safety. FAA-created runway incursion animation videos were incorporated into airline flight crew recurrent training in FY 2011.

Importance was placed on numerous issues such as the following:

- Display and use of airport ground navigation charts
- Contemporary human factors associated with the introduction of new technologies (e.g., aircraft equipped with advanced avionics displays and electronic flight bags)
- Understanding pilot-controller ground instructions and the potential for error during read-back
- Proper timing for the use of checklists and flight deck briefings during taxi
- Last-minute avionics and flight management system input

Several U.S. air carriers, in collaboration with the FAA, offered a one-day air traffic familiarization course that allows controllers to spend the day in ground school learning about the responsibilities and pitfalls of working in the cockpit of a transport-category aircraft. Controllers also observed a simulator session demonstrating pilot-controller interaction during ground operations.

Industry Conferences, Trade Shows, and Events

The Runway Safety Group demonstrated a strong presence at industry meetings and conferences to promote runway safety awareness. These platforms help engage industry leaders, airport managers, air traffic controllers, pilots, aircraft operators, and industry groups such as airline trade groups and aircraft manufacturers on runway safety issues.

Because general aviation pilots are responsible for 80 percent of all runway incursions, the Runway Safety Group also continued to reach out to the aviation industry with numerous educational, informational, and proactive communication initiatives focused on GA pilots.

In FY 2012 Runway Safety has participated in the following industry events: NBAA Annual Meeting and Convention in Las Vegas; ICAO Regional Runway Safety Conference in

Miami; ACI-NA Annual Conference in San Diego; AAAE Runway Safety Summit in Phoenix; Bombardier Safety Stand-down in Wichita, Kansas; Women in Aviation Annual Conference in Dallas; Experimental Aircraft Association (EAA) Sun 'n Fun event in Lakeland, Florida; AAAE Annual Meeting in Phoenix; Regional Airline Association (RAA) Annual Convention in Minneapolis; EAA AirVenture in Oshkosh, Wisconsin; and regional NBAA Forums in New Orleans, Van Nuys, California, and New York. Upcoming events include an NBAA Regional Forum in Seattle.

Several outreach sessions were conducted during April and May in various parts of the country, all leading up to National Transportation Week in May. Pilot meetings were conducted at several locations and safety briefings were given at flight schools and colleges with aviation curriculums. Many individuals who work or have business at airports around the country were provided with material to help make their operations safer.

Multimedia and Internet

In response to serious aircraft towing incidents, the Runway Safety Group produced a DVD presentation titled "Safe Tug and Tow Operations," and distributed thousands of copies to airlines, airports, and other stakeholders.

The Runway Safety Group also developed a new interactive training e-publication that embeds video clips into instructional text, allowing readers to view short videos of real-life experiences from aviation subject matter experts (such as pilots, mechanics, etc.). This new form of publication promotes interest in the subject matter and stimulates students' desire to learn more about how the industry works, as it brings otherwise "dry theory" to life.

Runway Safety regularly produces animations of known surface safety events that airlines, flight schools, and others are using in their pilot recurrent training efforts to raise awareness about common safety pitfalls, so that flight crews can mitigate risk during flight operations.

The FAA's public website continues to provide a comprehensive array of safety resources to pilots, airports, flight instructors, controllers, vehicle drivers, and others in the promotion of airport surface safety. The website, updated continually, also allows the public to view statistics focused on runway safety. For more information, visit: www.faa.gov/go/runwayconstruction.

The Runway Safety/Air Traffic Management Resources website is designed to provide resource location information in one convenient site to potential users involved in airport construction projects. Users can keep abreast of construction projects and find information on how to safely operate around them by using the FAA construction checklist, FAA best practices, and sample communications used on other construction projects.

Hot Spots

ICAO defines a hot spot as "a location on an aerodrome movement area with a history or potential risk of collision or runway incursion, and where heightened attention by pilots and drivers is necessary."

By identifying hot spots, it is easier for users of an airport to plan the safest possible path of movement. Hot spots also call attention to potentially confusing airport areas so pilots can exercise extra care.

Planning is a crucial safety activity for airport users — both pilots and air traffic controllers alike. By making sure that aircraft surface movements are planned and properly coordinated with air traffic control, pilots add another layer of safety to their flight preparations. Proper planning helps avoid confusion by eliminating last-minute questions and building familiarity with known problem areas.

The Runway Safety Group has reduced the time it takes to track current hot spots by working with FAA Charting and Aeronautical Navigation and using their Web portal to enable instant downloads of airport hot spot information (see Figure 5).

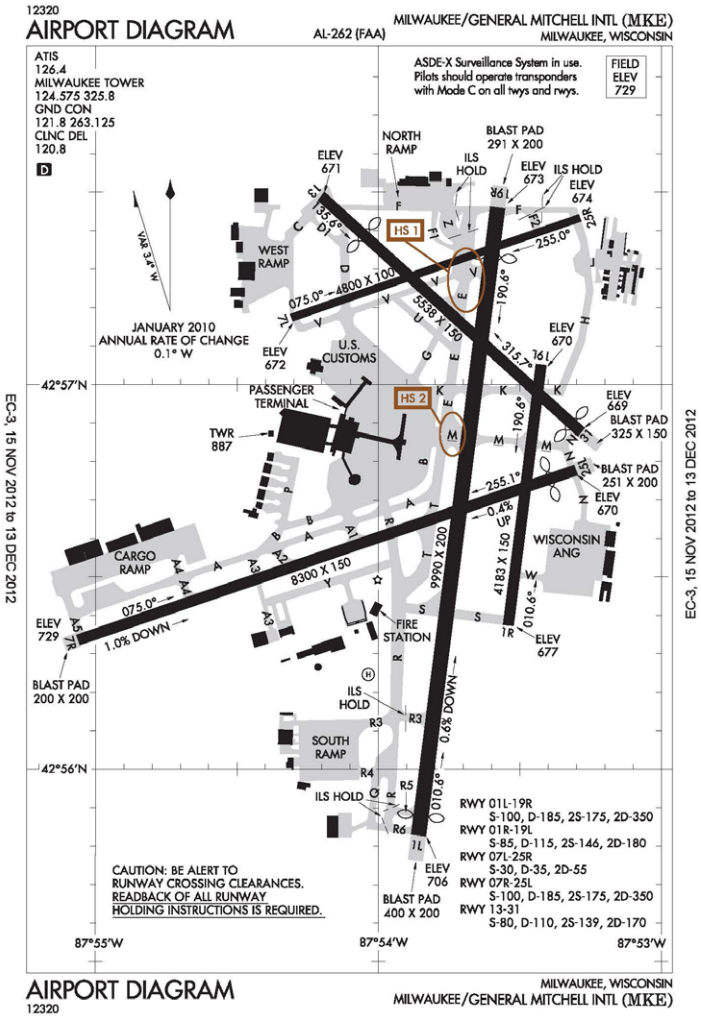


Figure 5: Sample Airport Diagram with Hot Spots

FAA/AOPA Online

The Aircraft Owners and Pilots Association (AOPA) online runway safety course, completed in FY 2010, is a comprehensive training and examination available both to AOPA members and non-members. The course includes:

- An in-depth guide to airport signs, pavement markings, and lighting
- Re-creations of several real-life runway incidents and accidents
- Valuable real-world insights from air traffic controllers
- Best practices for communication at towered and non-towered airports

The course continues to present a multitude of interactive exercises to help pilots hone their surface safety skills. It also provides airmen with a thorough review of every aspect of runway safety. To date, over 20,000 pilots have completed the course and passed the quiz.

Surface Navigation for Aviation Professionals (SNAP)

The Surface Navigation for Aviation Professionals (SNAP) action plan is a new initiative developed by the FAA's Flight Standards Service. Its actions are aimed at:

- Improving pilot knowledge
- Improving airman awareness of the elements that can induce a runway incursion
- A revision of the FAA Practical Test Standards to include a specific Runway Incursion Avoidance Required Task
- A revision of pilot knowledge reference materials
- Initiation of a new FAA enforcement remedial training process for pilots who cause a runway incursion. The process, based upon a national baseline runway incursion curriculum, employs the services of DPEs and CFIs.

Continued follow-up of the effectiveness of these actions will be the foundation for building the FY 2012 Runway

Incursion Pilot Deviation Action Plan from the Runway Safety Group and Flight Standards. The results of the review will enable Flight Standards to make adjustments to ensure the accomplishment of the FAA Flight Plan Goal to reduce runway incursions.

Flight Instructor Refresher Clinics (FIRC)

Flight instructor refresher clinics (FIRC) help flight instructors stay current with GA flight training guidance. The Runway Safety Group participates in dozens of clinics annually, reaching thousands of flight instructors who interact with many more students.

FIRCs are an important conduit for the runway safety message, starting at the source with student pilots. FAA runway safety professionals communicate the importance of runway safety directly to each flight instructor to convey proper runway safety awareness and incursion avoidance through improved training, printed reference materials and electronic media.

Additional Outreach Activities

A runway safety campaign aimed at GA pilots using placemats to depict airport signs and markings, along with a quiz, was tested at airport restaurants in the Southwestern region of the United States. The test campaign distributed more than 10,000 placemats. Response to the placemats has been so positive that an expansion of the campaign to other regions began in FY 2010 and is continuing.

Additional outreach educational promotions range from runway safety basics to new technologies and safety initiatives, all of which bring essential information to all U.S. pilots. These messages are conveyed via a variety of media, including brochures, fliers, videos, posters, websites, and other promotional materials.

Other Runway Safety Initiatives

The FAA Safety Standdown incorporates thousands of aviation safety seminars throughout the country each year. These interesting and informative seminars include important safety topics designed to reduce risk and increase the level of safety in aviation operations, particularly in the GA community.

The March/April 2011 issue of "FAA Safety Briefing" focuses on the four themes of the Second Annual FAASTeam Safety Standdown: positive flight attitude, going beyond preflight, en route cruise, and maneuvering flight. Articles are available on each of the critical areas where training and focus can improve GA safety.

Runway Safety Alerts

A Safety Alert for Operators (SAFO) contains important safety information and may include recommended action. SAFO content is especially valuable to air carriers in meeting their statutory duty to provide service with the highest possible degree of safety in the public interest. Besides the specific action recommended in a SAFO, an alternative action may be as effective in addressing the safety issue named in the SAFO.

The Runway Safety Challenge

The Runway Safety Challenge is an innovative way of gathering information on the types of safety-related materials that pilots and vehicle drivers need the most. To participate, users take an interactive electronic quiz and assessment of runway safety knowledge through the Runway Safety website. Each question consists of an image and four possible answers. All information provided is anonymous. By tracking responses, the information helps the Runway Safety Group understand the gaps in runway safety knowledge for emphasis in future education and training initiatives. Hundreds of stakeholders participate annually on their own time and at industry conferences, safety briefings, airport open houses, fly-ins, FIRCs and other gatherings.

The Runway Safety staff also uses a quiz system developed by Turning Point Technologies that tests knowledge of runway signs, markings, and lighting. The quiz is usually administered at industry trade shows and flight instructor refresher clinics. This data is then collected and analyzed to measure the competence and knowledge levels of pilots across the NAS.

Wildlife Hazard Mitigation

The FAA encourages all certificated airports to conduct wildlife hazard assessments (WHA), even if the airport has not experienced a Part 139 triggering event. Federally obligated GA airports are also encouraged to conduct WHAs or wildlife hazard site visits. These tools give fundamental wildlife and habitat information for an effective, airport-specific wildlife hazard mitigation program. The FAA continues to collaborate with the U.S. Department of Agriculture to maintain the National Wildlife Strike Database and provide an annual summary report available at: www.faa.gov/go/wildlife. Last year, the FAA also developed and distributed 12,000 copies of a new awareness poster titled "Report Wildlife Strikes" to more than 4,000 airports, flight schools, and other aviation organizations and facilities.

The FAA funded and helped develop two new Airport Cooperative Research Program (ACRP) reports to aid GA airports with mitigating wildlife hazards. In October 2011, 2,700 copies of ACRP Report 32, "Guidebook for Addressing Aircraft/Wildlife Hazards at General Aviation Airports" and ACRP Report Synthesis 23, "Bird Harassment, Repellent, and Deterrent Techniques for Use On and Near Airports" were distributed to all federally obligated National Plan of Integrated Airport System GA airports. The FAA also conducted research to deter or reduce wildlife strikes and is evaluating commercially available, low-cost, portable radars to reliably detect and track birds on or near airports. Additional research includes wildlife mitigation strategies such as alternatives to habitat management, technologies for harassing, deterring or excluding hazardous species, and aircraft-mounted alternating pulsed lights to enhance aircraft detection and reduce wildlife strikes.

Approach-Hold Markings and Guidance

Approach-Holds are markings designed to protect runway arrival and departure areas from taxiing aircraft. In doing random checking and testing provided to pilots and air traffic controllers, it was found that there was confusion and inadequate procedures among many users of the National Airspace System on how the Approach-Hold should be used—both from an air traffic control standpoint and from the cockpit. Great emphasis has been placed on this issue. New guidance is being developed to guidance that will align Flight Standards, the ATO, and airports. Pilot training publications updated have been standardized, and controllers will be receiving new training on this subject matter.

FAA Design Competition for Universities 2010 – 2012

The national FAA Design Competition for Universities for the 2010 – 2012 academic years engaged undergraduate and graduate students in a contest to address airport operations and infrastructure issues and needs. The competition is a STEM program (addressing topics of science, technology, engineering and mathematics) where students were presented with a number of technical challenges relating to airport operations and maintenance, runway safety, airport environmental interactions, and airport management and planning. The technical challenges embraced many engineering and science disciplines and were often used as part of a capstone design course.

The competition required students to reach out to airport operators and industry experts for advice on their proposals and help in assessing the efficacy of their proposed designs/solutions. This competition provides a framework and incentive for quality educational experiences for college students and raises student awareness of airports as a vital and interesting area for engineering and technology careers. Promising designs may receive FAA funding to take the concepts to the next stage of development.

A student team from the Department of Civil and Environmental Engineering at the University of California, Berkeley, won the first place award for Airport Management and Planning. The design presents a plan that could allow more effective use of all available gates across airlines to minimize delays. The team's submission, titled "Collaborative Gate Allocation," was recognized as a good solution for airlines and airports as well as the flying public. Professors Jasenka Rakas and Lee W. Schruben were the team's advisors.

The Human Factors and Systems Department at Embry-Riddle Aeronautical University Daytona Beach, Florida garnered the top prize for the Runway Safety/Runway Incursions Challenge. Their submission, titled "Tactile Stimulation System," was recognized for its development of a simple design to help increase pilot situational awareness using low-cost, aviation-grade rumble strips at key intersections. Professor Kelly Neville advised the student team. A submission from the same department and advisor, titled "Runway Incursion Prevention Lighting System (RIPLS)," received a second-place award, and another, called "eyePort," tied for a third place award in the same challenge category, an unprecedented one-category winning sweep by a single university.

The Computer Science Department at Binghamton University, the State University of New York, captured the top prize for the Airport Environmental Interactions challenge. Professor William Ziegler advised the student team. The submission was called "Pervious Concrete-based Airport Fuel Spill Control System," and was recognized for its innovative design, which was well planned and executed, and also had excellent interaction with airport operators and industry personnel. The proposed system would more efficiently capture fuel spills using top layers of pervious concrete and a nonporous bottom layer as part of its design. A second submission from the same department and advisor, titled "Smartphone Application to Improve Response Procedures for Downed Aircraft," received second-place in the Airport Management and Planning challenge category.

A student team from the Computer Science Department at the University of Southern California captured first place in the Airport Operations and Maintenance challenge with its design submission, entitled "USC Safety Management System." The students proposed a set of software tools that would provide a structured system for managing airport safety data, including the reporting process. The team was recognized for its originality in creating a tool to help bring airport operations into the twenty-first century. Professor David Wilczynski advised the student team.

Appendix A: Regional Runway Incursion Statistics[4]

	2011 Regional Runway Incursion Totals			
	OI	PD	V/PD	**Sum**
AAL (Alaska Region)	3	14	10	**27**
ACE (Central Region)	5	14	5	**24**
AEA (Eastern Region)	34	37	19	**90**
AGL (Great Lakes Region)	34	64	28	**126**
ANE (New England Region)	4	21	3	**28**
ANM (Northwest Mountain Region)	12	61	22	**95**
ASO (Southern Region)	34	114	30	**178**
ASW (Southwest Region)	25	96	22	**143**
AWP (Western Pacific Region)	27	172	44	**243**
Sum	**178**	**593**	**183**	**954**

[4] Annual RI Rate is per 100,000 operations

	2012 Regional Runway Incursion Totals				
	OE/D	PD	V/PD	Other*	**Sum**
AAL (Alaska Region)	3	16	6		25
ACE (Central Region)	2	23	5	1	31
AEA (Eastern Region)	44	72	31		147
AGL (Great Lakes Region)	40	83	31		154
ANE (New England Region)	3	20	2		25
ANM (Northwest Mountain Region)	18	57	21		96
ASO (Southern Region)	38	130	30		198
ASW (Southwest Region)	33	104	46	1	184
AWP (Western Pacific Region)	45	218	27		290
Sum	226	723	199	2	1150

*Other — Events that meet the criteria of a runway incursion though do not fit within the primary types (e.g. emergencies, equipment failures, etc…)

Alabama

Airport, City	Airport Code	Region	Fiscal Year	Severity A	Severity B	Severity C	Severity D	Total RI's	Annual RI Rate	Other Events, Non-RI's
Birmingham-Shuttlesworth Intl, AL	BHM	ASO	2008			2		2	1.51	1
			2009				1	1	.91	1
			2010			1		1		1
			2011			1	1	2	1.86	0
			2012				1	1	.96	0
Dothan Regional, AL	DHN	ASO	2010			1		1		0
Huntsville Intl-Carl T Jones Field, AL	HSV	ASO	2008				2	2	2.22	1
			2009				2	2	2.6	1
			2010			1	1	2		0
			2011				1	1	1.29	1
Mobile Downtown Airport, AL	BFM	ASO	2009			1	1	2	2.42	0
			2011			1	5	6	7.72	2
			2012				8	8	11.25	0
Mobile Regional, AL	MOB	ASO	2012				1	1	1.14	0
Montgomery Regional (Dannelly Field), AL	MGM	ASO	2009			1		1	1.5	0
			2012				1	1	1.55	0
Tuscaloosa Regional, AL	TCL	ASO	2008			1		1	1.88	0

Alaska

Airport, City	Airport Code	Region	Fiscal Year	Severity A	Severity B	Severity C	Severity D	Total RI's	Annual RI Rate	Other Events, Non-RI's
Bethel Airport, AK	BET	AAL	2008				2	2	2.03	0
			2012			1	1	2	2.02	0
Fairbanks Intl, AK	FAI	AAL	2008				6	6	5.2	1
			2009				8	8	6.6	3
			2010			3	11	14		3
			2011			1	3	4	3.32	1
			2012			1	3	4	3.18	1
Juneau Intl, AK	JNU	AAL	2008				1	1	1.12	0
			2009			2		2	2.37	1
			2010				1	1		1
			2011			1		1	1.03	0
			2012				4	4	4.62	0
King Salmon Airport, AK	AKN	AAL	2008				2	2	5.69	0
			2010			1		1		0
Kodiak, AK	ADQ	AAL	2011				1	1	2.68	0

Alaska (continued)

Airport, City	Airport Code	Region	Fiscal Year	Severity A	Severity B	Severity C	Severity D	Total RI's	Annual RI Rate	Other Events, Non-RI's
Lake Hood SPB, Anchorage, AK	LHD	AAL	2008				1	1		0
			2009			4	1	5		2
			2010			1	6	7		0
			2011			2	4	6		0
			2012			3	3	6		0
Merrill Field, Anchorage, AK	MRI	AAL	2008			1	11	12	6.93	1
			2009			1	12	13	7.71	3
			2010			3	6	9		4
			2011			1	11	12	8.78	3
			2012			1	3	4	3.32	3
Ted Stevens Anchorage Intl, AK	ANC	AAL	2008			3	6	9	3.1	1
			2009			3	3	6	2.34	4
			2010			4	2	6		2
			2011			2	1	3	1.09	0
			2012			3	2	5	1.84	1

Arizona

Airport, City	Airport Code	Region	Fiscal Year	Severity A	Severity B	Severity C	Severity D	Total RI's	Annual RI Rate	Other Events, Non-RI's
Chandler Muni, AZ	CHD	AWP	2008			2		2	.79	2
			2009			1	2	3	1.46	0
			2010			1		1		0
			2011			1	3	4	2.52	0
			2012			2	3	5	2.63	0
Ernest A. Love Field, Prescott, AZ	PRC	AWP	2008			4	3	7	2.74	1
			2009			9	6	15	5.88	1
			2010			5	5	10		1
			2011			2	3	5	2.01	1
			2012			6	1	7	2.86	2
Falcon Field, Mesa, AZ	FFZ	AWP	2008	1	1	7	5	14	4.26	0
			2009				2	2	.72	2
			2010			1	1	2		0
			2011			4	3	7	3.29	0
			2012			3	7	10	5.4	2
Flagstaff Pulliam Airport, AZ	FLG	AWP	2010				1	1		0

Arizona

Airport, City	Airport Code	Region	Fiscal Year	Severity A	Severity B	Severity C	Severity D	Total RI's	Annual RI Rate	Other Events, Non-RI's
Glendale Muni, AZ	GEU	AWP	2008			1		1	.71	0
			2009				1	1	.87	1
			2010				4	4		1
			2011				1	1	1.07	0
Grand Canyon National Park Airport, AZ	GCN	AWP	2009				1	1	1.08	0
			2010			1	1	2		0
			2012			1	1	2	1.95	0
Laughlin/Bullhead Intl, Bullhead City, AZ	IFP	AWP	2008		1			1	4.53	0
			2009				1	1	4.73	0
			2010				2	2		1
			2011				1	1	4.41	0
Phoenix Deer Valley Airport, AZ	DVT	AWP	2008			1	1	2	.55	0
			2009	1		8	8	17	4.16	6
			2010			6	2	8		1
			2011			8	12	20	6.04	7
			2012		1	8	10	19	5.3	7

Arizona (continued)

Airport, City	Airport Code	Region	Fiscal Year	Severity A	Severity B	Severity C	Severity D	Total RI's	Annual RI Rate	Other Events, Non-RI's
Phoenix Goodyear Airport, Goodyear, AZ	GYR	AWP	2009			1		1	.56	0
			2010			3		3		0
			2011			1	2	3	2.12	0
			2012			2	2	4	2.8	0
Phoenix-Mesa Gateway Airport, Phoenix, AZ	IWA	AWP	2008				5	5	1.96	0
			2009			2	4	6	3.18	1
			2010				6	6		0
			2011			3	5	8	4.5	1
			2012			3	11	14	8.44	7
Phoenix Sky Harbor Intl, AZ	PHX	AWP	2008			2	3	5	.96	2
			2009			1	6	7	1.52	2
			2010		1	1		2		3
			2011			2	2	4	.87	1
			2012			4	2	6	1.32	2
Ryan Field, Tucson, AZ	RYN	AWP	2010				2	2		0
			2011			2	2	4	3.6	0
			2012				1	1	.85	0
Scottsdale Airport, AZ	SDL	AWP	2011			2	5	7	4.96	0
			2012			2	2	4	2.92	8

Arizona (continued)

Airport, City	Airport Code	Region	Fiscal Year	Severity A	Severity B	Severity C	Severity D	Total RI's	Annual RI Rate	Other Events, Non-RI's
Tucson Intl, AZ	TUS	AWP	2008			2		2	.86	1
			2009			9	22	31	17.09	2
			2010			2	3	5		0
			2011			4	7	11	6.95	2
			2012			2	6	8	5.7	1

Arkansas

Airport, City	Airport Code	Region	Fiscal Year	Severity A	Severity B	Severity C	Severity D	Total RI's	Annual RI Rate	Other Events, Non-RI's
Adams Field, Little Rock, AR	LIT	ASW	2008				1	1	.76	1
			2010			1	1	2		0
			2012			1	2	3	2.74	0
Fort Smith Regional, AR	FSM	ASW	2009				1	1	2.21	1
			2010				1	1		0
			2012			2		2	4.97	0
Northwest Arkansas Regional, Fayetteville/ Springdale, AR	XNA	ASW	2011				1	1	2.33	0

Arkansas

Airport, City	Airport Code	Region	Fiscal Year	Severity A	Severity B	Severity C	Severity D	Total RI's	Annual RI Rate	Other Events, Non-RI's
Texarkana Regional-Webb Field, AR	TXK	ASW	2008				1	1	3.64	0
			2009				1	1	3.5	0
			2010				3	3		0
			2011				2	2	7.37	0
			2012				1	1	3.95	0

California

Airport, City	Airport Code	Region	Fiscal Year	Severity A	Severity B	Severity C	Severity D	Total RI's	Annual RI Rate	Other Events, Non-RI's
Atwater/Castle Airport, Atwater, CA	MER	AWP	2008	1			4	5	3.76	0
			2009				5	5	5.81	2
			2011			1	5	6	9.96	0
			2012			3	2	5	7.69	0
Bob Hope Airport, Burbank, CA	BUR	AWP	2008				1	1	.81	0
			2010			2	1	3		0
			2011			1		1	.84	0
			2012			1		1	.75	0

California (continued)

Airport, City	Airport Code	Region	Fiscal Year	Severity A	Severity B	Severity C	Severity D	Total RI's	Annual RI Rate	Other Events, Non-RI's
Brackett Field, La Verne, CA	POC	AWP	2008			3	3	6	4.96	0
			2009			1	1	2	1.89	5
			2010			4	4	8		1
			2011			1	1	2	1.89	3
			2012				1	1	1.1	1
Brown Field Muni, San Diego, CA	SDM	AWP	2008	1				1	.84	0
			2012			2	3	5	5.51	0
Buchanan Field, Concord, CA	CCR	AWP	2008			1	3	4	4.21	0
			2009				1	1	1.11	1
			2010			1		1		1
			2012				1	1	1.33	0
Camarillo Airport, CA	CMA	AWP	2008				2	2	1.3	4
			2009			2		2	1.23	6
			2010			3	1	4		3
			2011			1	2	3	2.29	8
			2012			2	2	4	3.04	2

California (continued)

Airport, City	Airport Code	Region	Fiscal Year	Severity A	Severity B	Severity C	Severity D	Total RI's	Annual RI Rate	Other Events, Non-RI's
Charles M. Schulz-Sonoma CO Airport, Santa Rosa, CA	STS	AWP	2008				1	1	.93	0
			2009				1	1	1.1	0
			2010			2	3	5		0
			2011				3	3	3.97	0
			2012				2	2	2.45	1
Chico Muni, CA	CIC	AWP	2008				1	1	1.78	0
			2010			1	2	3		0
			2011				1	1	2.1	0
			2012				1	1	1.8	0
Chino Airport, CA	CNO	AWP	2008				2	2	1.44	0
			2009			1	3	4	2.52	2
			2010		1	1	3	5		1
			2011			2	3	5	2.94	2
			2012			7	8	15	9.25	4

California (continued)

Airport, City	Airport Code	Region	Fiscal Year	Severity A	Severity B	Severity C	Severity D	Total RI's	Annual RI Rate	Other Events, Non-RI's
El Monte Airport, CA	EMT	AWP	2008			1		1	1.16	1
			2009					0		1
			2010				4	4		4
			2011					0		1
			2012				1	1	1.22	3
Fresno Yosemite Intl, CA	FAT	AWP	2008	1			1	2	1.25	0
			2009			1	4	5	3.85	0
			2010				1	1		0
			2011				2	2	1.58	0
			2012				1	1	.83	1
Fullerton Muni, CA	FUL	AWP	2008			1	1	2	2.85	0
General WM J Fox Airfield Airport, Lancaster, CA	WJF	AWP	2009			1		1	1.69	0
Gillespie Field, San Diego/El Cajon, CA	SEE	AWP	2008				1	1	.39	1
			2009				2	2	.91	0
			2010				1	1		0
			2011				3	3	1.34	0
			2012			1		1	.52	1

California (continued)

Airport, City	Airport Code	Region	Fiscal Year	Severity A	Severity B	Severity C	Severity D	Total RI's	Annual RI Rate	Other Events, Non-RI's
Hayward Executive Airport, CA	HWD	AWP	2009			2	3	5	4.1	0
			2010			1	1	2		0
			2011				1	1	1.14	0
			2012			2	3	5	5.65	1
Jack Northrop Field/ Hawthorne Muni, CA	HHR	AWP	2008			1	1	2	3.46	0
			2009				3	3	5.97	0
John Wayne Airport-Orange CO, Santa Ana, CA	SNA	AWP	2008			8	2	10	3.04	5
			2009			2	5	7	2.43	4
			2010			4	7	11		3
			2011			2	3	5	1.89	5
			2012			1	2	3	1.15	2
Livermore Muni, CA	LVK	AWP	2008			1	1	2	1.2	0
			2009			2	1	3	2.15	0
			2010	1		4	4	9		0
			2011			3	6	9	6.85	1
			2012	1		1	4	6	4.44	2

California (continued)

Airport, City	Airport Code	Region	Fiscal Year	Severity A	Severity B	Severity C	Severity D	Total RI's	Annual RI Rate	Other Events, Non-RI's
Long Beach/Daugherty Field, CA	LGB	AWP	2008			6	5	11	3.04	0
			2009			5	6	11	3.62	1
			2010			2	3	5		5
			2011				2	2	.69	1
			2012			2	5	7	2.58	1
Los Angeles Intl, CA	LAX	AWP	2008			3	6	9	1.37	1
			2009			3	5	8	1.47	0
			2010			8	4	12		4
			2011			13	6	19	3.19	0
			2012			12	8	20	3.28	3
McClellan-Palomar Airport, Carlsbad, CA	CRQ	AWP	2008			1	2	3	1.55	2
			2009			2	2	4	2.29	1
			2010			2	1	3		0
			2012			1	2	3	2.1	0
Meadows Field, Bakersfield, CA	BFL	AWP	2008				1	1	.79	0
			2009				2	2	1.61	1
			2012				1	1	.91	1

California (continued)

Airport, City	Airport Code	Region	Fiscal Year	Severity A	Severity B	Severity C	Severity D	Total RI's	Annual RI Rate	Other Events, Non-RI's
Metropolitan Oakland Intl, CA	OAK	AWP	2008			1		1	.34	0
			2009			2		2	.84	0
			2010			1		1		0
			2011			1	1	2	.94	0
Modesto City-CO-Harry Sham Field, CA	MOD	AWP	2010				1	1		0
			2011				1	1	2.24	0
Monterey Peninsula Airport, CA	MRY	AWP	2008			2	1	3	3.72	2
			2009			1	3	4	5.88	6
			2010			1	4	5		1
			2011			1	2	3	5.64	4
			2012			1	2	3	5.31	0
Montgomery Field, San Diego, CA	MYF	AWP	2008			1	3	4	1.68	0
			2009				1	1	.49	0
			2010			1	1	2		4
			2011				4	4	2.04	1
			2012			1	10	11	5.77	4

California (continued)

Airport, City	Airport Code	Region	Fiscal Year	Severity A	Severity B	Severity C	Severity D	Total RI's	Annual RI Rate	Other Events, Non-RI's
Napa County Airport, CA	APC	AWP	2008			2	5	7	5.8	0
			2009				2	2	1.91	0
			2010			1	1	2		0
			2011			1	3	4	7.41	0
			2012				1	1	2.08	0
Norman Y. Mineta San Jose Intl, CA	SJC	AWP	2008				8	8	4.05	0
			2009			2	8	10	5.92	0
			2010			2	2	4		1
			2011				5	5	3.63	1
			2012			1	2	3	2.21	1
Ontario Intl, CA	ONT	AWP	2008				2	2	1.48	0
			2009				4	4	3.98	2
			2010				2	2		1
			2011			2	1	3	3.27	0
Oxnard Airport, CA	OXR	AWP	2008			2	3	5	5.59	1
			2009			2	1	3	4.84	0
			2010				1	1		0
			2012			1	1	2	3.62	0

California (continued)

Airport, City	Airport Code	Region	Fiscal Year	Severity A	Severity B	Severity C	Severity D	Total RI's	Annual RI Rate	Other Events, Non-RI's
Palmdale Regional/USAF Plant 42, CA	PMD	AWP	2010				2	2		0
Palm Springs Intl, CA	PSP	AWP	2008				3	3	3.95	1
			2009				3	3	4.03	0
			2010			2		2		0
			2011				1	1	1.69	0
			2012				5	5	8.7	0
Palo Alto Airport of Santa Clara CO, CA	PAO	AWP	2008			3	2	5	2.86	0
			2010			1	2	3		0
			2011			1	3	4	2.35	2
			2012			2	1	3	1.7	2
Ramona Airport, CA	RNM	AWP	2010			1		1		0
Redding Muni, CA	RDD	AWP	2008				1	1	1.45	0
			2010				2	2		0
			2011			1		1	1.05	0
Reid-Hillview of Santa Clara CO Airport, San Jose, CA	RHV	AWP	2008					0	.	1
			2009				1	1	.78	0
			2010			2	2	4		1
			2011			1	1	2	1.69	1
			2012			3	1	4	2.88	4

California (continued)

Airport, City	Airport Code	Region	Fiscal Year	Severity A	Severity B	Severity C	Severity D	Total RI's	Annual RI Rate	Other Events, Non-RI's
Riverside Muni, CA	RAL	AWP	2008			3		3	4.03	0
			2011				2	2	3.27	0
			2012			2		2	2.84	2
Sacramento Executive Airport, CA	SAC	AWP	2009				1	1	1.09	0
			2010			1		1		0
			2012			1		1	1.07	0
Sacramento Intl, CA	SMF	AWP	2009			1		1	.76	0
			2011			1		1	.86	0
Sacramento Mather Airport, CA	MHR	AWP	2010			2		2		1
			2011				1	1	1.4	0
			2012		1		1	2	2.5	0
Salinas Muni, CA	SNS	AWP	2008				2	2	2.49	0
			2009			1		1	1.32	1
			2010			1	2	3		0
			2011				1	1	1.85	0
			2012			1	1	2	3.55	0
San Bernardino Intl, CA	SBD	AWP	2010					0		1
			2011				1	1		0

California (continued)

Airport, City	Airport Code	Region	Fiscal Year	Severity A	Severity B	Severity C	Severity D	Total RI's	Annual RI Rate	Other Events, Non-RI's
San Carlos Airport, CA	SQL	AWP	2008			1	1	2	1.37	1
			2009			1		1	.92	0
			2010			2	1	3		0
			2011			1	1	2	1.85	0
			2012			2	3	5	4.87	4
San Diego Intl, CA	SAN	AWP	2008		1	1	1	3	1.26	0
			2009				1	1	.49	0
			2011			1		1	.54	0
			2012			2		2	1.07	0
San Francisco Intl, CA	SFO	AWP	2008			11	9	20	5.08	0
			2009			3	5	8	2.12	0
			2010			7	5	12		0
			2011			4	9	13	3.26	1
			2012			2	5	7	1.66	1
San Luis CO Regional, San Luis Obispo, CA	SBP	AWP	2009				1	1	1.16	0
			2010					0		1
			2011					0	.	1
			2012			1	4	5	6.26	2

California (continued)

Airport, City	Airport Code	Region	Fiscal Year	Severity A	Severity B	Severity C	Severity D	Total RI's	Annual RI Rate	Other Events, Non-RI's
Santa Barbara Muni, CA	SBA	AWP	2008			1	3	4	3.38	0
			2009			1	4	5	4.69	0
			2010			2		2		0
			2011				2	2	1.88	1
			2012			3	3	6	5.78	0
Santa Maria Pub/Capt G Allan Hancock Field, CA	SMX	AWP	2008					0		1
			2009			1	1	2	3.51	0
			2011				1	1	2.08	1
Santa Monica Muni, CA	SMO	AWP	2009			1		1	.87	0
			2010				1	1		0
			2011				1	1	.93	0
			2012			1	3	4	3.75	0
Southern California Logistics Airport, Victorville, CA	VCV	AWP	2011				1	1	2.39	0
Stockton Metro, CA	SCK	AWP	2009				1	1	1.64	1
			2010				3	3		5
			2011				1	1	2.28	0
			2012			1	1	2	3.58	0

California (continued)

Airport, City	Airport Code	Region	Fiscal Year	Severity A	Severity B	Severity C	Severity D	Total RI's	Annual RI Rate	Other Events, Non-RI's
Van Nuys Airport, CA	VNY	AWP	2008			3	3	6	1.54	0
			2010				1	1		0
			2011			1	1	2	.66	0
			2012			1	3	4	1.51	0
Whiteman Airport, Los Angeles, CA	WHP	AWP	2008			1		1	1.09	0
			2010				1	1		0
			2011			1	1	2	2.54	1
Zamperini Field, Torrance, CA	TOA	AWP	2008				2	2	1.27	1
			2009				1	1	.73	3
			2010				2	2		1
			2011			1	1	2	1.65	0

Colorado

Airport, City	Airport Code	Region	Fiscal Year	Severity A	Severity B	Severity C	Severity D	Total RI's	Annual RI Rate	Other Events, Non-RI's
Centennial Airport, Denver, CO	APA	ANM	2008			3	2	5	1.5	0
			2009	1		2	6	9	3.32	2
			2010			4	4	8		0
			2011			5	8	13	4.49	0
			2012	1		2	6	9	3.03	0
City of Colorado Springs Muni, CO	COS	ANM	2008				1	1	.67	0
			2009			1	1	2	1.37	0
			2010				1	1		0
			2011			1	1	2	1.59	2
			2012			2		2	1.53	1
Denver Intl, CO	DEN	ANM	2008			3	1	4	.63	0
			2009			1	2	3	.49	1
			2010					0		3
			2011			3		3	.47	3
			2012			2	2	4	.65	0
Eagle CO Regional, CO	EGE	ANM	2008			1		1	2.33	1
			2009			1		1	3.19	0
			2010			1	4	5		1
			2012				1	1	2.73	0

Colorado (continued)

Airport, City	Airport Code	Region	Fiscal Year	Severity A	Severity B	Severity C	Severity D	Total RI's	Annual RI Rate	Other Events, Non-RI's
Front Range Airport, Denver, CO	FTG	ANM	2008			1		1	1.3	0
			2009		1		4	5	6.88	1
			2011					0	.	1
			2012				1	1	1.94	0
Pueblo Memorial Airport, CO	PUB	ANM	2008			3	8	11	6.77	0
			2009			1	1	2	1.3	0
			2010			1	1	2		1
			2011			1	1	2	1.24	0
			2012			1	1	2	1.23	0
Rocky Mountain Metro, Denver, CO	BJC	ANM	2008			1	2	3	1.95	1
			2009			1	2	3	2.44	3
			2010			1	3	4		1
			2011			1	2	3	2.4	0
			2012				3	3	2.51	0

Colorado (continued)

Airport, City	Airport Code	Region	Fiscal Year	Severity A	Severity B	Severity C	Severity D	Total RI's	Annual RI Rate	Other Events, Non-RI's
Sardy Field, Aspen, CO	ASE	ANM	2008				2	2	4.32	3
			2009					0		4
			2010				1	1		7
			2011				4	4	10.78	8
			2012			2	1	3	7.95	7
Walker Field, Grand Junction, CO	GJT	ANM	2008			1	1	2	2.79	0
			2009				2	2	3.4	0
			2011				1	1	1.96	0

Connecticut

Airport, City	Airport Code	Region	Fiscal Year	Severity A	Severity B	Severity C	Severity D	Total RI's	Annual RI Rate	Other Events, Non-RI's
Bradley Intl, Windsor Locks, CT	BDL	ANE	2008			1	3	4	3.09	0
			2009			1		1	.93	0
			2010			1	1	2		0
			2011				2	2	1.85	0
			2012				1	1	.99	0
Danbury Muni, CT	DXR	ANE	2008			1	1	2	2.42	0
			2010				1	1		0

Colorado (continued)

Airport, City	Airport Code	Region	Fiscal Year	Severity A	Severity B	Severity C	Severity D	Total RI's	Annual RI Rate	Other Events, Non-RI's
Hartford-Brainard Airport, Hartford, CT	HFD	ANE	2011				2	2	3.09	0
Igor I. Sikorsky Memorial, Bridgeport, CT	BDR	ANE	2010			2		2		0
Waterbury-Oxford Airport, Oxford, CT	OXC	ANE	2008				1	1	1.91	1
			2009					0		2
			2010				1	1		0
			2011				1	1	2.08	1
			2012				1	1	2.06	0

Delaware

Airport, City	Airport Code	Region	Fiscal Year	Severity A	Severity B	Severity C	Severity D	Total RI's	Annual RI Rate	Other Events, Non-RI's
New Castle Airport, Wilmington, DE	ILG	AEA	2008					0		1
			2009				1	1	1.74	0
			2010				2	2		0
			2012			1	7	8	14.3	0

District Of Columbia

Airport, City	Airport Code	Region	Fiscal Year	Severity A	Severity B	Severity C	Severity D	Total RI's	Annual RI Rate	Other Events, Non-RI's
Ronald Reagan Washington National Airport, Wash, DC	DCA	AEA	2008			3	2	5	1.79	0
			2009			1		1	.36	0
			2010			1	5	6		0
			2011			4	2	6	2.11	0
			2012			10	1	11	3.82	0
Washington Dulles Intl, Washington, DC	IAD	AEA	2008		1		4	5	1.24	2
			2009			7	2	9	2.44	1
			2010			1	2	3		0
			2011				4	4	1.09	0
			2012			4	2	6	1.74	1

Florida

Airport, City	Airport Code	Region	Fiscal Year	Severity A	Severity B	Severity C	Severity D	Total RI's	Annual RI Rate	Other Events, Non-RI's
Cecil Field, Jacksonville, FL	VQQ	ASO	2010			1	1	2		0
			2012				1	1	1.11	0
Craig Muni, Jacksonville, FL	CRG	ASO	2009				1	1	.87	0
Daytona Beach Intl, FL	DAB	ASO	2008	1		2	5	8	2.39	2
			2009			6	1	7	2.11	1
			2010			1	2	3		1
			2011			7	4	11	5.02	0
			2012			5	3	8	2.85	0
Executive Airport, Orlando, FL	ORL	ASO	2008			2	3	5	3.56	0
			2009			4	2	6	5.3	0
			2010			1		1		0
			2011			7		7	6.4	1
			2012			2	2	4	3.69	0
Flagler CO Airport, Palm Coast, FL	XFL	ASO	2010				1	1		0

Florida (continued)

Airport, City	Airport Code	Region	Fiscal Year	Severity A	Severity B	Severity C	Severity D	Total RI's	Annual RI Rate	Other Events, Non-RI's
Fort Lauderdale Executive Airport, FL	FXE	ASO	2008			6	6	12	6.42	11
			2009			5	2	7	4.57	6
			2010			6	6	12		2
			2011			6	8	14	9.4	2
			2012			4	2	6	3.8	1
Fort Lauderdale/ Hollywood Intl, FL	FLL	ASO	2008			1	2	3	.98	0
			2009			3	7	10	3.76	1
			2010			3		3		4
			2011			2	7	9	3.33	1
			2012			4	10	14	5.3	1
Gainesville Regional, FL	GNV	ASO	2008					0	.	1
			2012			1		1	1.47	0
Jacksonville Intl, FL	JAX	ASO	2009				1	1	1.02	0
			2010				1	1		0
			2011					0	.	1
			2012					0	.	1

Florida (continued)

Airport, City	Airport Code	Region	Fiscal Year	Severity A	Severity B	Severity C	Severity D	Total RI's	Annual RI Rate	Other Events, Non-RI's
Kendall-Tamiami Executive Airport, Miami, FL	TMB	ASO	2008			3	2	5	1.61	1
			2009			2	1	3	1.29	0
			2010			2	2	4		0
			2011			1		1	.58	1
			2012			2		2	1.	0
Key West Intl, FL	EYW	ASO	2012					0	.	1
Kissimmee Gateway Airport, Orlando, FL	ISM	ASO	2009			1		1	.79	0
			2010			1	2	3		0
			2012			2	2	4	3.31	1
Melbourne Intl, FL	MLB	ASO	2009			1		1	.68	0
			2010				3	3		0
			2011			1	3	4	2.12	0
			2012			3	5	8	4.41	0
Miami Intl, FL	MIA	ASO	2008			3	5	8	2.12	0
			2009			4	4	8	2.28	0
			2010			8	9	17		0
			2011			10	6	16	4.08	0
			2012			3	1	4	1.02	0

Florida (continued)

Airport, City	Airport Code	Region	Fiscal Year	Severity A	Severity B	Severity C	Severity D	Total RI's	Annual RI Rate	Other Events, Non-RI's
Naples Muni, FL	APF	ASO	2011				1	1	1.21	0
New Smyrna Beach Muni, FL	EVB	ASO	2010			1		1		0
			2011				1	1	.74	0
			2012			1	1	2	1.45	0
North Perry Airport, Hollywood, FL	HWO	ASO	2009	2		3	3	8	4.6	3
			2011			1	2	3	2.22	0
			2012		1			1	.8	1
Northwest Florida-Panama City Intl, FL	ECP	ASO	2012			1	1	2	3.45	0
Opa Locka Airport, Miami, FL	OPF	ASO	2008			1	2	3	3.06	3
			2009			2	1	3	3.36	2
			2010			1		1		0
			2011					0	.	1
			2012				3	3	2.97	0
Orlando Intl, FL	MCO	ASO	2008				1	1	.28	2
			2009				3	3	.97	0
			2010				1	1		1
			2011			2	2	4	1.25	0
			2012					0		1

Florida (continued)

Airport, City	Airport Code	Region	Fiscal Year	Severity A	Severity B	Severity C	Severity D	Total RI's	Annual RI Rate	Other Events, Non-RI's
Orlando Sanford Intl, Orlando, FL	SFB	ASO	2008			5	6	11	4.88	0
			2009		1	2	4	7	3.16	0
			2010			1	3	4		2
			2011			2	1	3	1.43	2
			2012			8	6	14	4.92	0
Ormond Beach Muni, FL	OMN	ASO	2012				1	1	.82	0
Page Field, Fort Myers, FL	FMY	ASO	2009				1	1	1.34	0
Palm Beach Intl, West Palm Beach, FL	PBI	ASO	2008		1		6	7	3.89	6
			2009			1	6	7	4.91	2
			2010				1	1		4
			2011			1	2	3	2.08	0
			2012			4	2	6	4.39	0
Panama City-Bay CO Intl, FL	PFN	ASO	2008				1	1	1.03	0
Pensacola Regional, FL	PNS	ASO	2008			2		2	1.83	0
			2009			1	1	2	2.06	0
			2010				2	2		0
			2011			1	2	3	2.56	0
			2012				1	1	.95	0

Florida (continued)

Airport, City	Airport Code	Region	Fiscal Year	Severity A	Severity B	Severity C	Severity D	Total RI's	Annual RI Rate	Other Events, Non-RI's
Sarasota/Bradenton Intl, FL	SRQ	ASO	2008				2	2	1.45	0
			2010			1	3	4		0
			2011				4	4	3.98	1
			2012			5	3	8	7.4	1
Southwest Florida Intl, Fort Myers, FL	RSW	ASO	2008				1	1	1.09	1
			2009				1	1	1.17	0
			2010			1		1		0
St Augustine Airport, FL	SGJ	ASO	2008			1	2	3	2.94	0
			2010			1		1		0
St Lucie CO Intl, Fort Pierce, FL	FPR	ASO	2008				2	2	1.32	0
			2010			3		3		0
			2012		1			1	.73	0
St Petersburg-Clearwater Intl, FL	PIE	ASO	2008	1	1		1	3	1.77	0
			2010			1	2	3		0
Tallahassee Regional, FL	TLH	ASO	2008				1	1	1.07	0
			2010			1		1		0
			2012					0	.	1

Florida (continued)

Airport, City	Airport Code	Region	Fiscal Year	Severity A	Severity B	Severity C	Severity D	Total RI's	Annual RI Rate	Other Events, Non-RI's
Tampa Intl, FL	TPA	ASO	2008			2	2	4	1.61	1
			2009			1		2	.98	0
			2010			2	2	4		0
			2011			1	4	5	2.59	1
			2012			1	2	3	1.58	1
Vero Beach Muni, FL	VRB	ASO	2008			2	3	5	2.92	1
			2009	1		1		2	1.22	1
			2010			3	2	5		0
			2011			2	1	3	1.96	0
			2012			1		1	.67	0
Witham Field, Stuart, FL	SUA	ASO	2008				3	3	4.45	0
			2009				1	1	1.68	0
			2011			1		1	1.79	0
			2012				2	2	3.56	0

Georgia

Airport, City	Airport Code	Region	Fiscal Year	Severity A	Severity B	Severity C	Severity D	Total RI's	Annual RI Rate	Other Events, Non-RI's
Athens/Ben Epps Airport, GA	AHN	ASO	2008				1	1	2.15	0
Augusta Regional at Bush Field, Augusta, GA	AGS	ASO	2011				1	1	3.34	0
Cobb CO-McCollum Field, Atlanta, GA	RYY	ASO	2008			1		1	1.03	0
Columbus Metro, GA	CSG	ASO	2009				1	1	2.97	0
			2011			2		2	6.29	0
			2012			5		5	19.16	0
DeKalb-Peachtree Airport, Atlanta, GA	PDK	ASO	2008	1		1	7	9	4.57	0
			2009	1		5	10	16	10.13	0
			2010			4	4	8		1
			2011			3	5	8	5.08	1
			2012		1	1	1	3	2.05	0
Fulton CO Airport-Brown Field, Atlanta, GA	FTY	ASO	2008			2	1	3	2.72	0
			2011			1	3	4	6.6	0
Gwinnett CO-Briscoe Field, Lawrenceville, GA	LZU	ASO	2008					0	.	1
			2010				1	1		0

Georgia (continued)

Airport, City	Airport Code	Region	Fiscal Year	Severity A	Severity B	Severity C	Severity D	Total RI's	Annual RI Rate	Other Events, Non-RI's
Hartsfield-Jackson Atlanta Intl, GA	ATL	ASO	2008			14	8	22	2.23	0
			2009			8	7	15	1.54	0
			2010			16	2	18		2
			2011			10	4	14	1.51	1
			2012			14	5	19	2.04	4
Middle Georgia Regional, Macon, GA	MCN	ASO	2010			1		1		0
			2012				1	1	6.71	0
Savannah/Hilton Head Intl, Savannah, GA	SAV	ASO	2008			2	2	4	4.02	1
			2009				2	2	2.21	0
			2010			1	5	6		0
			2011				1	1	.99	1
			2012			2	4	6	6.69	1
Southwest Georgia Regional, Albany, GA	ABY	ASO	2009				1	1	3.39	0

Guam

Airport, City	Airport Code	Region	Fiscal Year	Severity A	Severity B	Severity C	Severity D	Total RI's	Annual RI Rate	Other Events, Non-RI's
Guam Intl, Agana, GU	GUM	AWP	2008				2	2	3.38	0
			2009				1	1	1.68	0
			2011			1		1	1.55	0
			2012					0		1

Hawaii

Airport, City	Airport Code	Region	Fiscal Year	Severity A	Severity B	Severity C	Severity D	Total RI's	Annual RI Rate	Other Events, Non-RI's
Hilo Intl, HI	ITO	AWP	2008				1	1	1.19	0
			2010			1		1		0
Honolulu Intl, HI	HCF	AWP	2012			1		1	#DIV/0	0
	HNL		2008		1	1	1	3	1.04	1
			2009	1		2	2	5	1.8	2
			2010			4	5	9		1
			2011			7	2	9	3.37	1
			2012	1	1	12	2	16	5.88	0
Kahului Airport, HI	OGG	AWP	2008				1	1	.74	0
			2009			1		1	.84	0

Hawaii (continued)

Airport, City	Airport Code	Region	Fiscal Year	Severity A	Severity B	Severity C	Severity D	Total RI's	Annual RI Rate	Other Events, Non-RI's
Kalaeloa Airport, Kapolei, HI	JRF	AWP	2008			1		1	.77	0
			2010				1	1		0
			2011				1	1	.82	0
Kona Intl at Keahole Airport, Kailua/Kona, HI	KOA	AWP	2008					0	.	1
			2009				1	1	.9	0
			2010			1		1		0

Idaho

Airport, City	Airport Code	Region	Fiscal Year	Severity A	Severity B	Severity C	Severity D	Total RI's	Annual RI Rate	Other Events, Non-RI's
Boise Air Terminal/ Gowen Field, ID	BOI	ANM	2008			4	1	5	3.19	0
			2010			1		1		0
			2011				1	1	.83	0
			2012			1		1	.87	0
Friedman Memorial Airport, Hailey, ID	SUN	ANM	2008				1	1	2.76	0
			2009				1	1	3.42	0
			2010				2	2		7
			2011				5	5	17.67	1
			2012			1	4	5	18.54	3

Idaho (continued)

Airport, City	Airport Code	Region	Fiscal Year	Severity A	Severity B	Severity C	Severity D	Total RI's	Annual RI Rate	Other Events, Non-RI's
Idaho Falls Regional, ID	IDA	ANM	2008			1	6	7	16.21	0
			2009				2	2	4.75	1
			2010				1	1		5
			2011				3	3	8.01	0
			2012			1	4	5	12.82	1
Lewiston-Nez Perce CO Airport, Lewiston, ID	LWS	ANM	2012			1	1	2	6.47	0
Pocatello Regional, ID	PIH	ANM	2011					0	.	1

Illinois

Airport, City	Airport Code	Region	Fiscal Year	Severity A	Severity B	Severity C	Severity D	Total RI's	Annual RI Rate	Other Events, Non-RI's
Abraham Lincoln Capital Airport, Springfield, IL	SPI	AGL	2008			1	6	7	17.62	1
			2009				7	7	22.68	1
			2010				3	3		0
			2011				1	1	3.31	1
			2012			1	3	4	11.31	0

Illinois (continued)

Airport, City	Airport Code	Region	Fiscal Year	Severity A	Severity B	Severity C	Severity D	Total RI's	Annual RI Rate	Other Events, Non-RI's
Central IL Regional, Bloomington-Normal, IL	BMI	AGL	2008				2	2	5.7	0
			2009			1		1	3.5	0
			2010				3	3		0
			2011				3	3	10.88	0
			2012				3	3	10.55	0
Chicago Executive Airport, Chicago/ Prospect Hgts/ Wheeling, IL	PWK	AGL	2008			3	1	4	3.94	0
			2009					0	.	1
			2010				1	1		0
			2011			2	2	4	4.75	1
			2012		1	1	3	5	5.85	0
Chicago Midway Intl, Chicago, IL	MDW	AGL	2008			2	4	6	2.13	0
			2009			4	2	6	2.46	0
			2010			3	3	6		0
			2011			2	4	6	2.38	0
			2012			8	5	13	5.15	1

Illinois (continued)

Airport, City	Airport Code	Region	Fiscal Year	Severity A	Severity B	Severity C	Severity D	Total RI's	Annual RI Rate	Other Events, Non-RI's
Chicago O'Hare Intl, IL	ORD	AGL	2008		1	9	5	15	1.66	0
			2009			6	5	11	1.33	0
			2010			14		14		0
			2011	3		11	3	17	1.92	0
			2012		1	16	12	29	3.3	1
Chicago Rockford Intl, IL	RFD	AGL	2008			1	1	2	3.	1
			2009				1	1	1.95	0
			2010			2		2		0
			2011			1	3	4	9.13	0
			2012				2	2	4.48	4
Dupage Airport, Chicago (West Chicago), IL	DPA	AGL	2008			1		1	1.01	0
			2009			1		1	1.14	1
			2011				1	1	1.18	0
			2012			1	5	6	7.39	0

Illinois (continued)

Airport, City	Airport Code	Region	Fiscal Year	Severity A	Severity B	Severity C	Severity D	Total RI's	Annual RI Rate	Other Events, Non-RI's
Greater Peoria Regional, IL	PIA	AGL	2008			1		1	1.93	0
			2009			1		1	2.28	0
			2010				1	1		0
			2011				1	1	2.3	0
			2012			1	2	3	6.38	0
Quad City Intl, Moline, IL	MLI	AGL	2008	1		1	4	6	11.98	1
			2009			2	7	9	19.39	0
			2012				4	4	10.56	0
Southern Illinois Airport, Carbondale/ Murphysboro, IL	MDH	AGL	2010				1	1		0
St Louis Downtown Airport, Cahokia/St Louis, IL	CPS	AGL	2008				2	2	1.74	0
			2009			1		1	.84	0
			2010				3	3		0
			2011				2	2	2.23	0
			2012	1		1	1	3	3.82	0

Illinois (continued)

Airport, City	Airport Code	Region	Fiscal Year	Severity A	Severity B	Severity C	Severity D	Total RI's	Annual RI Rate	Other Events, Non-RI's
University of Illinois-Willard Airport, Champaign-Urbana, IL	CMI	AGL	2008			2		2	1.98	0
			2009			2	2	4	4.43	0
			2010			1		1		0
			2012				1	1	1.69	0
Waukegan Regional, Chicago/Waukegan, IL	UGN	AGL	2010			1	1	2		0
Williamson CO Regional, Marion, IL	MWA	AGL	2012			1		1	3.65	0

Indiana

Airport, City	Airport Code	Region	Fiscal Year	Severity A	Severity B	Severity C	Severity D	Total RI's	Annual RI Rate	Other Events, Non-RI's
Columbus Muni, IN	BAK	AGL	2008				1	1	2.54	0
Delaware CO-Johnson Field, Muncie, IN	MIE	AGL	2010				1	1		0
			2011				1	1	4.58	0
Evansville Regional, IN	EVV	AGL	2008			2		2	3.11	1
			2012				1	1	2.45	0

Indiana (continued)

Airport, City	Airport Code	Region	Fiscal Year	Severity A	Severity B	Severity C	Severity D	Total RI's	Annual RI Rate	Other Events, Non-RI's
Fort Wayne Intl, IN	FWA	AGL	2008				1	1	1.5	0
			2011			2	1	3	7.98	0
			2012				2	2	4.88	0
Gary/Chicago Intl, Gary, IN	GYY	AGL	2009				1	1	2.86	2
			2010			1	1	2		0
Indianapolis Intl, IN	IND	AGL	2008			2		2	.99	2
			2010				2	2		0
Indianapolis Regional, IN	MQJ	AGL	2011				1	1		0
Monroe CO Airport, Bloomington, IN	BMG	AGL	2008				1	1	2.88	0
			2010			2		2		0
Purdue University Airport, Lafayette, IN	LAF	AGL	2008				1	1	.92	0
			2011				3	3	3.22	0
			2012				3	3	3.1	2
South Bend Regional, IN	SBN	AGL	2008			1		1	1.99	2
			2011				1	1	2.76	0
Terra Haute Intl-Hulman Field, IN	HUF	AGL	2009				1	1	2.39	0
			2010				1	1		0
			2011				1	1	2.15	0

Iowa

Airport, City	Airport Code	Region	Fiscal Year	Severity A	Severity B	Severity C	Severity D	Total RI's	Annual RI Rate	Other Events, Non-RI's
Des Moines Intl, IA	DSM	ACE	2008			3	1	4	4.12	1
			2009			1	4	5	5.55	0
			2010				2	2		0
			2011			1	2	3	3.62	0
			2012			2	2	4	4.87	2
Dubuque Regional, IA	DBQ	ACE	2010			1		1		0
The Eastern Iowa Airport, Cedar Rapids, IA	CID	ACE	2010			1		1		0
Waterloo Muni, IA	ALO	ACE	2008				2	2	7.92	1
			2009				2	2	7.81	0
			2010					0		1
			2011			1		1	4.94	0

Island of Saipan in the Mariana Islands

Airport, City	Airport Code	Region	Fiscal Year	Severity A	Severity B	Severity C	Severity D	Total RI's	Annual RI Rate	Other Events, Non-RI's
Francisco C. Ada/Saipan Intl, Saipan Island, CQ	GSN	AWP	2011				1	1	2.14	0
			2012			1	1	2	2.92	0

Kansas

Airport, City	Airport Code	Region	Fiscal Year	Severity A	Severity B	Severity C	Severity D	Total RI's	Annual RI Rate	Other Events, Non-RI's
Forbes Field, Topeka, KS	FOE	ACE	2008					0	.	2
			2009					0	.	3
			2010				1	1		0
			2012				1	1	4.04	0
Garden City Regional, KS	GCK	ACE	2010	1		1	3	5		0
			2011				2	2	12.39	0
Hutchinson Muni, KS	HUT	ACE	2011				1	1	2.62	0
Johnson CO Executive Airport, Olathe, KS	OJC	ACE	2009					0	.	1
			2011				1	1	2.01	0
			2012			1		1	1.8	0
Manhattan Regional, KS	MHK	ACE	2010			1	1	2		0
			2012			1		1	4.27	0
New Century Aircenter Airport, Olathe, KS	IXD	ACE	2008				2	2	3.55	0
Philip Billard Muni, Topeka, KS	TOP	ACE	2008				1	1	1.64	0

Kansas (continued)

Airport, City	Airport Code	Region	Fiscal Year	Severity A	Severity B	Severity C	Severity D	Total RI's	Annual RI Rate	Other Events, Non-RI's
Salina Muni, KS	SLN	ACE	2008			1		1	1.42	0
			2010				1	1		0
Wichita Mid-Continent Airport, KS	ICT	ACE	2008				1	1	.6	0
			2009				2	2	1.31	1
			2010				1	1		1
			2011			1		1	.65	1
			2012				1	1	.6	0

Kansas

Airport, City	Airport Code	Region	Fiscal Year	Severity A	Severity B	Severity C	Severity D	Total RI's	Annual RI Rate	Other Events, Non-RI's
Barkley Regional, Paducah, KY	PAH	ASO	2011				2	2	6.19	0
Blue Grass Airport, Lexington, KY	LEX	ASO	2008			3		3	3.91	0
			2009			1	1	2	2.96	1
			2010			1	1	2		2
			2011				2	2	2.96	2
			2012				1	1	1.48	0

Kentucky

Airport, City	Airport Code	Region	Fiscal Year	Severity A	Severity B	Severity C	Severity D	Total RI's	Annual RI Rate	Other Events, Non-RI's
Bowman Field, Louisville, KY	LOU	ASO	2008			1	3	4	4.49	0
			2009				1	1	1.34	0
			2010				3	3		0
			2011			3	3	6	8.53	1
			2012			4	5	9	11.39	0
Cincinnati/Northern Kentucky Intl, Covington, KY	CVG	ASO	2008					0	.	1
			2009				1	1	.43	2
Louisville Intl-Standiford Field, Louisville, KY	SDF	ASO	2008			2		2	1.2	1
			2011				1	1	.65	1
			2012			1	2	3	2.03	0
Owensboro-Daviess CO Airport, Owensboro, KY	OWB	ASO	2012				1	1	2.61	0

Louisiana

Airport, City	Airport Code	Region	Fiscal Year	Severity A	Severity B	Severity C	Severity D	Total RI's	Annual RI Rate	Other Events, Non-RI's
Baton Rouge Metro/ Ryan Field, LA	BTR	ASW	2008				5	5	6.37	1
			2009				1	1	1.58	1
			2010				1	1		5
			2011			3	1	4	5.95	0
			2012				2	2	2.94	0
Chennault Intl, Lake Charles, LA	CWF	ASW	2008				1	1	3.32	0
			2012				1	1	3.68	0
Houma-Terrebonne Airport, Houma, LA	HUM	ASW	2011				1	1	1.37	0
Lafayette Regional, LA	LFT	ASW	2008			2		2	2.6	3
			2009			2	1	3	3.69	0
			2010			1	2	3		4
			2011			2	2	4	6.09	1
			2012			3	1	4	6.5	6
Lake Charles Regional, LA	LCH	ASW	2008					0	.	4
			2010				1	1		0
			2012				1	1	2.17	0

Louisiana (continued)

Airport, City	Airport Code	Region	Fiscal Year	Severity A	Severity B	Severity C	Severity D	Total RI's	Annual RI Rate	Other Events, Non-RI's
Lakefront Airport, New Orleans, LA	NEW	ASW	2008					0	.	1
			2009				1	1	1.99	0
			2010			2	2	4		1
			2011			6		6	10.17	0
			2012			8	17	25	42.06	2
Louis Armstrong New Orleans Intl, LA	MSY	ASW	2008			3	2	5	3.7	3
			2009				2	2	1.69	0
			2010			1	4	5		1
			2011			1	2	3	2.43	0
Monroe Regional, LA	MLU	ASW	2008				2	2	4.41	1
			2009			1	4	5	11.87	1
			2010				6	6		2
			2011			2	4	6	17.07	0
			2012				1	1	3.15	0
Shreveport Downtown Airport, LA	DTN	ASW	2008				3	3	5.43	0
			2009				3	3	5.43	1
Shreveport Regional, LA	SHV	ASW	2008				1	1	1.81	0

Maine

Airport, City	Airport Code	Region	Fiscal Year	Severity A	Severity B	Severity C	Severity D	Total RI's	Annual RI Rate	Other Events, Non-RI's
Bangor Intl, ME	BGR	ANE	2008				1	1	1.5	0
			2012			1		1	2.1	0
Portland Intl Jetport, ME	PWM	ANE	2008			1		1	1.33	0
			2010			1		1		0
			2011				2	2	3.49	0
			2012			1		1	1.79	0

Maryland

Airport, City	Airport Code	Region	Fiscal Year	Severity A	Severity B	Severity C	Severity D	Total RI's	Annual RI Rate	Other Events, Non-RI's
Andrews AFB, MD	ADW	AEA	2008				1	1	1.	0
			2009			2		2	2.05	1
			2011			1		1	1.1	0
Baltimore/Washington Intl Thurgood Marshall, MD	BWI	AEA	2008		1	2	2	5	1.75	0
			2009			5	1	6	2.26	0
			2010				1	1		1
			2011			1	2	3	1.08	0
			2012			4	7	11	4.05	0

Maryland (continued)

Airport, City	Airport Code	Region	Fiscal Year	Severity A	Severity B	Severity C	Severity D	Total RI's	Annual RI Rate	Other Events, Non-RI's
Easton/Newnam Field, Easton, MD	ESN	AEA	2008			3	2	5	12.39	0
			2009				4	4	8.24	0
			2011				2	2	4.53	0
			2012			2	1	3	6.85	0
Frederick Airport, MD	FDK	AEA	2012			1	1	2	4.27	0
Martin State Airport, Baltimore, MD	MTN	AEA	2011				1	1	1.5	0
Salisbury-Ocean City Wicomico Regional, Salisbury, MD	SBY	AEA	2011			1		1	2.28	0

Massachusetts

Airport, City	Airport Code	Region	Fiscal Year	Severity A	Severity B	Severity C	Severity D	Total RI's	Annual RI Rate	Other Events, Non-RI's
Barnstable Muni-Boardman/Polando Field, Hyannis, MA	HYA	ANE	2009				1	1	.89	0
General Edward Lawrence Logan Intl, Boston, MA	BOS	ANE	2008			9	8	17	4.42	0
			2009			7	2	9	2.5	1
			2010			7	4	11		1
			2011			5	4	9	2.41	2
			2012			6	3	9	2.47	0

Maine

Airport, City	Airport Code	Region	Fiscal Year	Severity A	Severity B	Severity C	Severity D	Total RI's	Annual RI Rate	Other Events, Non-RI's
Laurence G. Hanscom Field, Bedford MA	BED	ANE	2008			1		1	.56	0
			2009				1	1	.54	0
			2010			2	3	5		2
			2011			3		3	1.79	0
			2012			1		1	.59	0
Lawrence Muni, MA	LWM	ANE	2009				1	1	1.77	1
			2010				1	1		1
			2012			1		1	1.89	0
Marthas Vineyard Airport, Vineyard Haven, MA	MVY	ANE	2008			1		1	1.99	0
			2010				1	1		0
New Bedford Regional, MA	EWB	ANE	2009			1	1	2	3.1	0
			2010				1	1		0
			2011				1	1	1.8	0

Michigan (continued)

Airport, City	Airport Code	Region	Fiscal Year	Severity A	Severity B	Severity C	Severity D	Total RI's	Annual RI Rate	Other Events, Non-RI's
Ann Arbor Muni, MI	ARB	AGL	2008				1	1	1.45	0
			2009			1	1	2	3.61	0
			2010				1	1		0
			2012				1	1	1.57	2
Battle Creek Intl, Kalamazoo, MI	AZO	AGL	2008				1	1	1.6	1
			2009			2	5	7	13.98	1
			2010					0		2
			2011				1	1	2.1	0
			2012					0	.	1
Bishop Intl, Flint, MI	FNT	AGL	2009			1	3	4	6.7	1
			2012			1	2	3	6.75	0
Capital City Airport, Lansing, MI	LAN	AGL	2009			1		1	2.4	0
			2010					0		1
			2011					0	.	1
Cherry Capital Airport, Traverse City, MI	TVC	AGL	2012			2		2	2.35	0
Coleman A. Young Muni, Detroit, MI	DET	AGL	2008				1	1	1.67	0
			2010				2	2		0
			2011			1	1	2	3.23	0

Michigan (continued)

Airport, City	Airport Code	Region	Fiscal Year	Severity A	Severity B	Severity C	Severity D	Total RI's	Annual RI Rate	Other Events, Non-RI's
Detroit Metro Wayne CO Airport, MI	DTW	AGL	2008			8	3	11	2.35	0
			2009			1	3	4	.91	7
			2010			2	2	4		2
			2011			4	1	5	1.12	0
			2012			2	1	3	.69	1
Gerald R. Ford Intl, Grand Rapids, MI	GRR	AGL	2008			1		1	1.	0
			2010				1	1		0
			2012			1		1	1.16	0
Jackson CO-Reynolds Field, Jackson, MI	JXN	AGL	2008				1	1	1.97	1
MBS Intl, Saginaw, MI	MBS	AGL	2009				1	1	3.22	1
			2011			1		1	3.74	0
Muskegon CO Airport, MI	MKG	AGL	2009					0	.	1
Oakland CO Intl, Pontiac, MI	PTK	AGL	2008				3	3	1.75	1
			2009			1	3	4	2.77	2
			2010			4	7	11		1
			2011				1	1	.87	0
			2012				2	2	1.54	1

Michigan (continued)

Airport, City	Airport Code	Region	Fiscal Year	Severity A	Severity B	Severity C	Severity D	Total RI's	Annual RI Rate	Other Events, Non-RI's
Sawyer Intl, Marquette, MI	SAW	AGL	2008				1	1	4.01	1
			2012				1	1	5.13	0
Willow Run Airport, Detroit, MI	YIP	AGL	2010				3	3		0
			2011				5	5	7.43	0
W. K. Kellogg Airport, Battle Creek, MI	BTL	AGL	2010					0		1
			2011				1	1	1.48	0
			2012			1		1	1.21	0

Minnesota

Airport, City	Airport Code	Region	Fiscal Year	Severity A	Severity B	Severity C	Severity D	Total RI's	Annual RI Rate	Other Events, Non-RI's
Anoka CO-Blaine Airport, Minneapolis, MN	ANE	AGL	2008			1	3	4	5.64	0
			2009					0	.	1
Crystal Airport, Minneapolis, MN	MIC	AGL	2008			1	2	3	5.6	0
			2009			2	2	4	9.66	0
			2010				10	10		4
			2011				6	6	14.58	3
			2012				5	5	9.95	1

Minnesota (continued)

Airport, City	Airport Code	Region	Fiscal Year	Severity A	Severity B	Severity C	Severity D	Total RI's	Annual RI Rate	Other Events, Non-RI's
Duluth Intl, MN	DLH	AGL	2008				1	1	1.52	0
			2010			1		1		1
			2012				1	1	1.6	0
Flying Cloud Airport, Minneapolis, MN	FCM	AGL	2008			2	3	5	4.24	0
			2009			4	11	15	12.56	0
			2010			3	11	14		3
			2011			2	4	6	5.74	1
			2012			3	4	7	7.13	1
Minneapolis-St. Paul Intl (Wold-Chamberlain), MN	MSP	AGL	2008				1	1	.22	0
			2009			5	3	8	1.82	0
			2010			2	1	3		0
			2011			6	3	9	2.05	0
			2012			8		8	1.88	1
Rochester Intl, MN	RST	AGL	2010				1	1		0
			2011				3	3	7.48	1
			2012				1	1	2.75	0

Minnesota (continued)

Airport, City	Airport Code	Region	Fiscal Year	Severity A	Severity B	Severity C	Severity D	Total RI's	Annual RI Rate	Other Events, Non-RI's
St Cloud Regional, MN	STC	AGL	2008				1	1	2.5	0
			2010			1	3	4		0
			2011				1	1	2.86	0
St Paul Downtown Holman Field, MN	STP	AGL	2008				2	2	1.77	1
			2010				2	2		0
			2011			1	1	2	2.27	0
			2012				1	1	1.23	0

Mississippi

Airport, City	Airport Code	Region	Fiscal Year	Severity A	Severity B	Severity C	Severity D	Total RI's	Annual RI Rate	Other Events, Non-RI's
Golden Triangle Regional, Columbus-West Point-Starkville, MS	GTR	ASO	2008				2	2	6.21	0
Gulfport-Biloxi Intl, MS	GPT	ASO	2008				1	1	1.83	0
			2010			1	1	2		0
Hawkins Field, Jackson, MS	HKS	ASO	2010				1	1		0

Mississippi (continued)

Airport, City	Airport Code	Region	Fiscal Year	Severity A	Severity B	Severity C	Severity D	Total RI's	Annual RI Rate	Other Events, Non-RI's
Jackson-Evers Intl, Jackson, MS	JAN	ASO	2008			1	1	2	2.96	0
			2010				1	1		0
			2012				1	1	1.91	1
Mid Delta Regional, Greenville, MS	GLH	ASO	2008				1	1	3.91	0
			2009				1	1	3.92	0
Tupelo Regional, MS	TUP	ASO	2009				1	1	1.63	0

Missouri

Airport, City	Airport Code	Region	Fiscal Year	Severity A	Severity B	Severity C	Severity D	Total RI's	Annual RI Rate	Other Events, Non-RI's
Branson, MO	BBG	ACE	2010				1	1		0
			2011				1	1	13.78	0
Charles B. Wheeler Downtown Airport, Kansas City, MO	MKC	ACE	2008			1		1	1.27	0
			2010			2		2		1
			2012			1	1	2	2.67	0
Jefferson City Memorial Airport, MO	JEF	ACE	2009				1	1	3.86	0
			2012			1		1	3.34	0

Missouri (continued)

Airport, City	Airport Code	Region	Fiscal Year	Severity A	Severity B	Severity C	Severity D	Total RI's	Annual RI Rate	Other Events, Non-RI's
Joplin Regional, MO	JLN	ACE	2008				3	3	12.92	0
			2010			1	1	2		0
			2011				4	4	16.01	0
			2012			3	7	10	37.91	2
Kansas City Intl, MO	MCI	ACE	2008				1	1	.53	1
			2009				1	1	.66	2
			2010			1	3	4		1
			2011			1		1	.7	4
Lambert-St Louis Intl, MO	STL	ACE	2008			1	2	3	1.17	0
			2009			1	2	3	1.39	1
			2010			3	2	5		0
			2011			4		4	2.1	0
			2012			2	1	3	1.56	1
Spirit of St Louis Airport, St Louis, MO	SUS	ACE	2008			1		1	.81	1
Springfield-Branson National Airport, Springfield, MO	SGF	ACE	2008					0	.	1
			2009					0	.	1
			2010				2	2		0
			2012				1	1	2.22	0

Montana

Airport, City	Airport Code	Region	Fiscal Year	Severity A	Severity B	Severity C	Severity D	Total RI's	Annual RI Rate	Other Events, Non-RI's
Billings Logan Intl, MT	BIL	ANM	2008			1	4	5	5.24	0
			2009			1	4	5	5.98	2
			2010			4	8	12		2
			2011			1	1	2	2.44	0
			2012			2	1	3	3.52	0
Gallatin Field, Bozeman, MT	BZN	ANM	2008				2	2	2.5	0
			2009			2	2	4	5.61	0
			2010				2	2		0
			2012			2		2	2.43	0
Glacier Park Intl, Kalispell, MT	GPI	ANM	2009			2		2	7.02	0
Great Falls Intl, MT	GTF	ANM	2009					0	.	1
			2010			1	2	3		1
			2011				1	1	2.57	0
			2012			1	2	3	8.12	0
Helena Regional, MT	HLN	ANM	2008				1	1	1.6	0
			2010					0		1
			2011			1	1	2	4.52	0
			2012			1	1	2	4.99	1

Montana (continued)

Airport, City	Airport Code	Region	Fiscal Year	Severity A	Severity B	Severity C	Severity D	Total RI's	Annual RI Rate	Other Events, Non-RI's
Missoula Intl, MT	MSO	ANM	2008			1	1	2	4.71	0
			2009			1	1	2	5.14	0
			2010			1		1		0

Nebraska

Airport, City	Airport Code	Region	Fiscal Year	Severity A	Severity B	Severity C	Severity D	Total RI's	Annual RI Rate	Other Events, Non-RI's
Central Nebraska Regional, Grand Island, NE	GRI	ACE	2008				1	1	4.97	0
Eppley Airfield, Omaha, NE	OMA	ACE	2008				7	7	5.59	0
			2009				2	2	1.78	4
			2010				6	6		1
			2011				1	1	.91	0
			2012			2		2	1.9	0
Lincoln Airport, NE	LNK	ACE	2008			1		1	1.38	1
			2009				3	3	4.49	0
			2010			2	3	5		1
			2011				4	4	6.64	2
			2012			1	3	4	6.45	0

Nevada

Airport, City	Airport Code	Region	Fiscal Year	Severity A	Severity B	Severity C	Severity D	Total RI's	Annual RI Rate	Other Events, Non-RI's
Henderson Executive Airport, Las Vegas, NV	HND	AWP	2008			1		1	1.51	1
			2009				2	2	3.3	1
			2010				5	5		0
			2011			1		1	1.12	1
			2012				1	1	1.06	0
McCarran Intl, Las Vegas, NV	LAS	AWP	2008			6	6	12	1.98	1
			2009			5	8	13	2.53	0
			2010			6	4	10		0
			2011			3	1	4	.76	1
			2012			2	6	8	1.51	0
North Las Vegas Airport, NV	VGT	AWP	2008			2	11	13	7.14	7
			2009			1	6	7	5.02	2
			2010			2	3	5		2
			2011			3	17	20	13.88	0
			2012			3	21	24	16.01	0
Reno/Tahoe Intl, NV	RNO	AWP	2008			1	1	2	1.44	2
			2009			1	1	2	1.94	1
			2010			1	1	2		0
			2011	1			4	5	5.64	0
			2012			1		1	1.22	0

New Hampshire

Airport, City	Airport Code	Region	Fiscal Year	Severity A	Severity B	Severity C	Severity D	Total RI's	Annual RI Rate	Other Events, Non-RI's
Boire Field, Nashua, NH	ASH	ANE	2008				1	1	1.	0
			2012				4	4	6.71	0
Lebanon Muni, NH	LEB	ANE	2009					0	.	1
Manchester Airport, NH	MHT	ANE	2008				16	16	19.76	0
			2009				5	5	7.06	0
			2010				2	2		0
			2011				3	3	4.54	0
			2012				2	2	3.29	0

New Jersey

Airport, City	Airport Code	Region	Fiscal Year	Severity A	Severity B	Severity C	Severity D	Total RI's	Annual RI Rate	Other Events, Non-RI's
Atlantic City Intl, NJ	ACY	AEA	2008			1	5	6	6.44	0
			2009				1	1	1.	0
			2010				3	3		0
			2011					0	.	2
			2012				3	3	3.83	0

New Jersey (continued)

Airport, City	Airport Code	Region	Fiscal Year	Severity A	Severity B	Severity C	Severity D	Total RI's	Annual RI Rate	Other Events, Non-RI's
Essex CO Airport, Caldwell, NJ	CDW	AEA	2009			1	2	3	3.52	0
			2010			1	1	2		0
			2011			1	1	2	2.53	0
Morristown Muni, NJ	MMU	AEA	2008				1	1	.71	0
			2010					0		1
			2011			1		1	.89	2
			2012			1	1	2	2.96	0
Newark Liberty Intl, NJ	EWR	AEA	2008		1	2	5	8	1.8	0
			2009			5	5	10	2.38	0
			2010			1	1	2		0
			2011			5	2	7	1.7	0
			2012			10	3	13	3.05	0
Teterboro Airport, NJ	TEB	AEA	2008		1	2	1	4	2.14	0
			2009			1	3	4	2.79	0
			2010			1		1		1
			2011			4	4	8	4.96	0
			2012			7	1	8	4.97	0

New Jersey (continued)

Airport, City	Airport Code	Region	Fiscal Year	Severity A	Severity B	Severity C	Severity D	Total RI's	Annual RI Rate	Other Events, Non-RI's
Trenton Mercer Airport, Trenton, NJ	TTN	AEA	2009					0	.	1
			2010			1		1		0
			2011			1	1	2	2.57	0
			2012				2	2	2.54	0

New Mexico

Airport, City	Airport Code	Region	Fiscal Year	Severity A	Severity B	Severity C	Severity D	Total RI's	Annual RI Rate	Other Events, Non-RI's
Albuquerque Intl Sunport, NM	ABQ	ASW	2008			2		2	1.08	0
			2009			2	2	4	2.48	0
			2010			1	3	4		1
			2011			3	4	7	4.52	0
			2012			2	3	5	3.32	1
Double Eagle II, Albuquerque, NM	AEG	ASW	2011				1	1	1.43	0
			2012				1	1	1.47	0
Four Corners Regional, Farmington, NM	FMN	ASW	2009				1	1	1.47	0
			2010					0		1

New Mexico (continued)

Airport, City	Airport Code	Region	Fiscal Year	Severity A	Severity B	Severity C	Severity D	Total RI's	Annual RI Rate	Other Events, Non-RI's
Lea CO Regional, Hobbs, NM	HOB	ASW	2011				1	1	8.8	0
			2012					0	.	1
Roswell Intl Air Center, NM	ROW	ASW	2008				1	1	1.81	0
			2012					0	.	1

New York

Airport, City	Airport Code	Region	Fiscal Year	Severity A	Severity B	Severity C	Severity D	Total RI's	Annual RI Rate	Other Events, Non-RI's
Albany Intl, NY	ALB	AEA	2008			1		1	1.06	0
			2009			1		1	1.07	0
			2010			1	1	2		0
			2012			1		1	1.29	0
Buffalo Niagara Intl, NY	BUF	AEA	2008			1		1	.72	0
			2009				2	2	1.51	0
			2010			1	2	3		0
			2012			2		2	1.6	0

New York (continued)

Airport, City	Airport Code	Region	Fiscal Year	Severity A	Severity B	Severity C	Severity D	Total RI's	Annual RI Rate	Other Events, Non-RI's
Dutchess CO Airport, Poughkeepsie, NY	POU	AEA	2008				2	2	2.32	1
			2009				2	2	3.52	0
			2010			1		1		0
			2011				3	3	4.22	0
			2012			2		2	2.31	0
Elmira/Corning Regional, NY	ELM	AEA	2008				1	1	2.66	0
			2012				1	1	3.72	0
Francis S. Gabreski Airport, Westhampton Beach, NY	FOK	AEA	2011				1	1	1.81	0
			2012				1	1	1.64	0
Greater Binghamton/ Edwin A. Link Field, NY	BGM	AEA	2008				1	1	4.39	1
			2009				1	1	4.6	1
			2011				1	1	4.82	0
			2012				3	3	13.31	0
Greater Rochester Intl, NY	ROC	AEA	2009				2	2	1.87	0
			2011				1	1	.96	0
			2012			1		1	1.07	0
Ithaca Tompkins Regional, Ithaca, NY	ITH	AEA	2010				1	1		0

New York (continued)

Airport, City	Airport Code	Region	Fiscal Year	Severity A	Severity B	Severity C	Severity D	Total RI's	Annual RI Rate	Other Events, Non-RI's
John F Kennedy Intl, New York, NY	JFK	AEA	2008			9	2	11	2.43	0
			2009			2	6	8	1.85	0
			2010			6	2	8		0
			2011			2	1	3	.73	1
			2012			4	2	7	1.7	1
La Guardia Airport, New York, NY	LGA	AEA	2008			2	1	3	.77	0
			2009			2	2	4	1.11	0
			2010			2	1	3		0
			2012	1		6	1	8	2.12	0
Long Island MacArthur Airport, Islip, NY	ISP	AEA	2008				1	1	.55	0
			2010			1	2	3		0
			2011			2	1	3	2.28	0
			2012				1	1	.65	0
Niagara Falls Intl, NY	IAG	AEA	2008				1	1	3.09	0
			2009				2	2	5.32	0
			2010			1		1		0
			2011				1	1	3.53	0
			2012				2	2	7.91	0

New York (continued)

Airport, City	Airport Code	Region	Fiscal Year	Severity A	Severity B	Severity C	Severity D	Total RI's	Annual RI Rate	Other Events, Non-RI's
Republic Airport, Farmingdale, NY	FRG	AEA	2009			2	1	3	1.75	0
			2010			3	1	4		0
			2011			2		2	1.1	0
			2012			5		5	2.31	0
Rome/Griffiss Intl, Rome, NY	RME	AEA	2010				1	1		0
Stewart Intl, Newburgh, NY	SWF	AEA	2008			2		2	2.35	0
			2009			1	1	2	4.42	0
			2010				1	1		0
Syracuse Hancock Intl, NY	SYR	AEA	2008		1	1		2	1.9	1
			2009					0	.	1
			2012			1		1	1.46	0
Westchester CO Airport, White Plains, NY	HPN	AEA	2008			1	4	5	2.66	0
			2009			1		1	.58	0
			2010				1	1		0
			2011			2	2	4	2.07	0
			2012	1		5	3	9	4.7	0

North Carolina

Airport, City	Airport Code	Region	Fiscal Year	Severity A	Severity B	Severity C	Severity D	Total RI's	Annual RI Rate	Other Events, Non-RI's
Asheville Regional, NC	AVL	ASO	2008					0	.	1
			2010			2		2		0
			2012				1	1	1.62	0
Charlotte/Douglas Intl, NC	CLT	ASO	2008			3	4	7	1.29	1
			2009	1		3	3	7	1.36	0
			2010			4	3	7		2
			2011			5	6	11	2.02	3
			2012		1	4	5	10	1.82	1
Coastal Carolina Regional, New Bern, NC	EWN	ASO	2011					0		3
Concord Regional, NC	JQF	ASO	2010					0		1
			2011					0		1
Hickory Regional, NC	HKY	ASO	2009			1		1	3.25	0
Piedmont Triad Intl, Greensboro, NC	GSO	ASO	2008				2	2	1.98	0
			2009				3	3	3.6	1
			2010			3	3	6		1
			201z1			1	2	3	3.32	0
			2012					0	.	1

North Carolina (continued)

Airport, City	Airport Code	Region	Fiscal Year	Severity A	Severity B	Severity C	Severity D	Total RI's	Annual RI Rate	Other Events, Non-RI's
Raleigh-Durham Intl, NC	RDU	ASO	2008			3	2	5	2.1	6
			2010				3	3		0
			2011			1		1	.52	0
			2012			3		3	1.57	0
Wilmington Intl, NC	ILM	ASO	2008			2	1	3	4.14	0
			2011			1	1	2	3.6	0
			2012				1	1	1.9	1

North Dakota

Airport, City	Airport Code	Region	Fiscal Year	Severity A	Severity B	Severity C	Severity D	Total RI's	Annual RI Rate	Other Events, Non-RI's
Bismarck Muni, ND	BIS	AGL	2008				2	2	4.19	0
			2011				1	1	2.09	0
			2012			1	1	2	3.92	0
Grand Forks Intl, ND	GFK	AGL	2008			1	1	2	.87	4
			2009			3	2	5	1.51	3
			2010			3	1	4		2
			2011				1	1	.29	2
			2012		1	2		3	.81	0

North Dakota (continued)

Airport, City	Airport Code	Region	Fiscal Year	Severity A	Severity B	Severity C	Severity D	Total RI's	Annual RI Rate	Other Events, Non-RI's
Hector Intl, Fargo, ND	FAR	AGL	2009				2	2	2.43	0
			2010				1	1		0
			2011					0	.	1
			2012				2	2	2.47	0
Minot Intl, ND	MOT	AGL	2008				1	1	2.84	0
			2009				1	1	2.67	0

Ohio

Airport, City	Airport Code	Region	Fiscal Year	Severity A	Severity B	Severity C	Severity D	Total RI's	Annual RI Rate	Other Events, Non-RI's
Akron-Canton Regional, Akron, OH	CAK	AGL	2008				2	2	1.9	0
			2009				2	2	2.39	0
			2011				1	1	1.44	0
			2012			1	1	2	2.79	1
Bolton Field, Columbus, OH	TZR	AGL	2009				2	2	8.05	0
			2010				2	2		1
			2011				1	1	5.48	0

Ohio

Airport, City	Airport Code	Region	Fiscal Year	Severity A	Severity B	Severity C	Severity D	Total RI's	Annual RI Rate	Other Events, Non-RI's
Burke Lakefront Airport, Cleveland, OH	BKL	AGL	2010				2	2		0
			2011				1	1	1.86	0
			2012				1	1	1.63	0
Cincinnati Muni-Lunken Field, OH	LUK	AGL	2008			2	3	5	7.09	1
			2009				1	1	1.63	0
			2011			1	2	3	4.77	1
Cleveland-Hopkins Intl, OH	CLE	AGL	2008		1	5	8	14	5.71	1
			2009			5	3	8	3.93	0
			2010			1	3	4		1
			2011				3	3	1.57	2
			2012			1	1	2	1.09	0
Cuyahoga CO Airport, Cleveland, OH	CGF	AGL	2011				1	1	2.8	0
James M Cox Dayton Intl, OH	DAY	AGL	2009			1		1	1.49	0
			2011				2	2	2.99	0
			2012				3	3	4.66	0
Mansfield Lahm Regional, OH	MFD	AGL	2009				2	2	8.75	0
			2012			1	2	3	16.37	1

Ohio (continued)

Airport, City	Airport Code	Region	Fiscal Year	Severity A	Severity B	Severity C	Severity D	Total RI's	Annual RI Rate	Other Events, Non-RI's
Ohio State University Airport, Columbus, OH	OSU	AGL	2008			2	2	4	5.74	1
			2010				1	1		0
			2011			1		1	1.43	0
Port Columbus Intl, Columbus, OH	CMH	AGL	2008					0	.	2
			2009				3	3	2.04	0
			2010				1	1		1
			2011			1	1	2	1.47	1
			2012			1		1	.76	0
Toledo Express Airport, OH	TOL	AGL	2009				2	2	3.19	0
			2010				3	3		0
			2012				1	1	3.07	0
Youngstown-Warren Regional, Youngstown, OH	YNG	AGL	2008			1	3	4	6.51	1
			2009				2	2	3.55	0
			2010				2	2		0

Oklahoma

Airport, City	Airport Code	Region	Fiscal Year	Severity A	Severity B	Severity C	Severity D	Total RI's	Annual RI Rate	Other Events, Non-RI's
Richard Lloyd Jones Jr Airport, Tulsa, OK	RVS	ASW	2008				1	1	.29	1
			2010				2	2		0
			2012			1	1	2	1.14	0
Stillwater Regional, OK	SWO	ASW	2009			2	1	3	5.28	0
			2010				1	1		0
			2011				4	4	6.64	0
			2012				4	4	6.92	0
Tulsa Intl, OK	TUL	ASW	2008			2	2	4	2.96	0
			2009			1	1	2	1.7	0
			2010					0		1
			2011				2	2	1.85	1
			2012				4	4	3.95	1
Wiley Post Airport, Oklahoma City, OK	PWA	ASW	2008				1	1	1.35	0
			2009					0	.	1
Will Rogers World Airport, Oklahoma City, OK	OKC	ASW	2008				1	1	.75	0
			2012				2	2	1.61	0

Oregon

Airport, City	Airport Code	Region	Fiscal Year	Severity A	Severity B	Severity C	Severity D	Total RI's	Annual RI Rate	Other Events, Non-RI's
Eastern Oregon Regional at Pendleton, OR	PDT	ANM	2009					0	.	1
			2010				1	1		0
			2011				1	1	8.18	0
Mahlon Sweet Field Airport, Eugene, OR	EUG	ANM	2008			1	3	4	5.04	1
			2009				2	2	2.71	0
			2010			1	1	2		1
			2011			1		1	1.44	1
			2012				2	2	3.42	1
McNary Field, Salem, OR	SLE	ANM	2008				1	1	1.51	0
			2009			1		1	1.95	1
			2010			2		2		0
			2012				1	1	3.18	0
Portland-Hillsboro Airport, Portland, OR	HIO	ANM	2008			2	1	3	1.15	0
			2009			3		3	1.3	0
			2010				1	1		0
			2011			1	3	4	1.88	0
			2012			5	1	6	2.92	1

Oregon (continued)

Airport, City	Airport Code	Region	Fiscal Year	Severity A	Severity B	Severity C	Severity D	Total RI's	Annual RI Rate	Other Events, Non-RI's
Portland Intl, OR	PDX	ANM	2008			4	1	5	1.91	0
			2009			1	1	2	.88	0
			2010			1		1		1
			2011			1	3	4	1.81	1
			2012			4	1	5	2.3	1
Portland-Troutdale Airport, Portland, OR	TTD	ANM	2008			1		1	1.07	1
			2009			2	1	3	3.95	2
			2012				2	2	2.18	0
Roberts Field, Redmond, OR	RDM	ANM	2009			1	3	4	7.18	0
			2010				2	2		0
			2011				1	1	2.15	0
			2012				4	4	8.61	0
Rogue Valley Intl-Medford Airport, Medford, OR	MFR	ANM	2011			1		1	2.3	0
			2012					0	.	1
Southwest Oregon Rgnl, North Bend, OR	OTH	ANM	2010				3	3		0

Pennsylvania

Airport, City	Airport Code	Region	Fiscal Year	Severity A	Severity B	Severity C	Severity D	Total RI's	Annual RI Rate	Other Events, Non-RI's
Allegheny CO Airport, Pittsburgh, PA	AGC	AEA	2011				1	1	1.55	0
Capital City Airport, Harrisburg, PA	CXY	AEA	2009				1	1	3.83	0
			2010				1	1		0
Erie Intl/Tom Ridge Field, PA	ERI	AEA	2009					0	.	1
			2011			1		1	3.7	0
			2012				1	1	3.9	0
Harrisburg Intl, PA	MDT	AEA	2008				1	1	1.47	0
			2012			1		1	1.62	3
Lancaster Airport, PA	LNS	AEA	2009			1		1	1.1	0
Lehigh Valley Intl, Allentown, PA	ABE	AEA	2008	1			1	2	1.63	0
			2009				2	2	1.92	0
			2010			1		1		1
Northeast Philadelphia Airport, PA	PNE	AEA	2008			2	1	3	3.35	2
			2009			1	1	2	2.81	0
			2010			1		1		0
			2011				2	2	3.16	0
			2012				1	1	1.39	1

Pennsylvania (continued)

Airport, City	Airport Code	Region	Fiscal Year	Severity A	Severity B	Severity C	Severity D	Total RI's	Annual RI Rate	Other Events, Non-RI's
Philadelphia Intl, PA	PHL	AEA	2008			9	5	14	2.81	1
			2009			2	8	10	2.1	0
			2010			6	6	12		1
			2011			5	5	10	2.21	0
			2012			9	3	12	2.68	0
Pittsburgh Intl, PA	PIT	AEA	2008			3		3	1.69	0
			2009			1		1	.67	0
			2010			1		1		0
			2011				7	7	4.64	1
			2012			1	3	4	2.85	4
Reading Regional/Carl A Spaatz Field, PA	RDG	AEA	2008	1			2	3	3.29	0
			2009				1	1	1.09	2
			2011				2	2	2.47	1
			2012			1	1	2	2.3	0
University Park, PA	UNV	AEA	2012			1		1	1.1	0
Wilkes-Barre/Scranton Intl, PA	AVP	AEA	2008				2	2	2.84	0
			2010				1	1		0
Williamsport Regional, PA	IPT	AEA	2009				2	2	9.14	0
			2010				1	1		0

Puerto Rico

Airport, City	Airport Code	Region	Fiscal Year	Severity A	Severity B	Severity C	Severity D	Total RI's	Annual RI Rate	Other Events, Non-RI's
Aguadilla/Rafael Hernandez Airport, PR	BQN	ASO	2008				2	2	3.66	0
			2009				2	2	3.21	0
			2010				1	1		0
			2011					0	.	1
Fernando Luis Ribas Dominicci Airport, San Juan, PR	SIG	ASO	2008					0	.	1
			2009			1		1	1.02	0
			2010			1		1		0
			2011					0	.	3
			2012					0	.	1
Luis Munoz Marin Intl, San Juan, PR	SJU	ASO	2008			1	1	2	1.09	4
			2009			2	3	5	2.92	0
			2010				2	2		0
			2011			2	2	4	2.47	3
			2012			1		1	.62	2

Rhode Island

Airport, City	Airport Code	Region	Fiscal Year	Severity A	Severity B	Severity C	Severity D	Total RI's	Annual RI Rate	Other Events, Non-RI's
Theodore Francis Green State Airport, Providence, RI	PVD	ANE	2008			2	1	3	3.18	0
			2009			1	1	2	2.37	0
			2010				4	4		0
			2011				1	1	1.26	0

South Carolina

Airport, City	Airport Code	Region	Fiscal Year	Severity A	Severity B	Severity C	Severity D	Total RI's	Annual RI Rate	Other Events, Non-RI's
Charleston AFB/Intl, SC	CHS	ASO	2008			2	3	5	4.45	0
			2009				2	2	1.98	0
			2010	1		1	5	7		0
			2011				1	1	.98	0
			2012			2	4	6	5.57	1
Columbia Metro, SC	CAE	ASO	2008			1	2	3	3.26	1
			2009			1	1	2	2.78	0
			2010			2	1	3		0
			2012			1	2	3	5.65	0
Donaldson Center Airport, Greenville, SC	GYH	ASO	2008				1	1	2.58	0

South Carolina (continued)

Airport, City	Airport Code	Region	Fiscal Year	Severity A	Severity B	Severity C	Severity D	Total RI's	Annual RI Rate	Other Events, Non-RI's
Florence Regional, SC	FLO	ASO	2008				1	1	3.56	0
			2009				1	1	4.67	0
			2010				2	2		0
			2011			1	1	2	11.76	0
Greenville Spartanburg Intl, Greer, SC	GSP	ASO	2009			1		1	2.02	0
			2012				1	1	2.01	0
Myrtle Beach Intl, SC	MYR	ASO	2010				1	1		0

South Dakota

Airport, City	Airport Code	Region	Fiscal Year	Severity A	Severity B	Severity C	Severity D	Total RI's	Annual RI Rate	Other Events, Non-RI's
Joe Foss Field, Sioux Falls, SD	FSD	AGL	2008			2	1	3	4.47	1
			2009				2	2	3.23	1
			2011				1	1	1.53	0
			2012				1	1	1.5	0
Rapid City Regional, SD	RAP	AGL	2008			1	2	3	6.97	0

Tennessee

Airport, City	Airport Code	Region	Fiscal Year	Severity A	Severity B	Severity C	Severity D	Total RI's	Annual RI Rate	Other Events, Non-RI's
Lovell Field, Chattanooga, TN	CHA	ASO	2008				1	1	1.34	0
			2009			1		1	1.72	0
			2010				1	1		0
			2011				1	1	1.9	1
McGhee Tyson Airport, Knoxville, TN	TYS	ASO	2008				6	6	4.79	0
			2009			1	4	5	4.7	0
			2010			1	1	2		0
			2012				2	2	1.89	0
McKellar-Sipes Regional, Jackson, TN	MKL	ASO	2011				1	1	5.3	0
Memphis Intl, TN	MEM	ASO	2008			3		3	.81	2
			2010			1	2	3		2
			2011			1	6	7	2.18	0
			2012			3	2	5	1.77	0
Nashville Intl, TN	BNA	ASO	2008			1		1	.5	0
			2009			1	6	7	4.	1
			2010				2	2		0
			2011					0	.	1
			2012				2	2	1.15	2

Tennessee (continued)

Airport, City	Airport Code	Region	Fiscal Year	Severity A	Severity B	Severity C	Severity D	Total RI's	Annual RI Rate	Other Events, Non-RI's
Smyrna Airport, TN	MQY	ASO	2011			1	1	2	3.33	0
			2012			1	6	7	10.57	0
Tri-Cities Regional TN/VA Airport, Bristol/Johnson/Kingsport, TN	TRI	ASO	2009				1	1	1.85	0

Texas

Airport, City	Airport Code	Region	Fiscal Year	Severity A	Severity B	Severity C	Severity D	Total RI's	Annual RI Rate	Other Events, Non-RI's
Abilene Regional, TX	ABI	ASW	2008			1		1	1.14	0
			2009				1	1	1.47	0
			2012				1	1	1.59	1
Addison Airport, Dallas, TX	ADS	ASW	2008			5	6	11	7.45	5
			2009			6	5	11	9.66	1
			2010			3	6	9		5
			2011			3	10	13	13.8	12
			2012			4	7	11	11.46	3

Texas (continued)

Airport, City	Airport Code	Region	Fiscal Year	Severity A	Severity B	Severity C	Severity D	Total RI's	Annual RI Rate	Other Events, Non-RI's
Amarillo Intl, TX	AMA	ASW	2008			1	1	2	2.42	0
			2010					0		1
			2011				1	1	1.3	0
			2012				1	1	1.56	0
Arlington Municipal Airport, TX	GKY	ASW	2008				1	1	.74	0
			2009			1	1	2	2.4	0
			2011				1	1	1.28	1
			2012				2	2	2.83	1
Austin-Bergstrom Intl, TX	AUS	ASW	2008			1		1	.46	0
			2009			1		1	.56	0
			2010				2	2		0
			2011			2	1	3	1.67	0
			2012			4	2	6	3.54	1
Brownsville/South Padre Island Intl, TX	BRO	ASW	2008					0	.	2

Texas (continued)

Airport, City	Airport Code	Region	Fiscal Year	Severity A	Severity B	Severity C	Severity D	Total RI's	Annual RI Rate	Other Events, Non-RI's
Collin CO Regional at McKinney Airport, TX	TKI	ASW	2009			1		1	1.07	0
			2010			1	1	2		2
			2011			1		1	1.2	0
			2012			1		1	1.2	0
Corpus Cristi Intl, TX	CRP	ASW	2009			1	5	6	5.94	1
			2010				2	2		0
			2011			3	2	5	4.86	1
			2012			1	2	3	3.25	0
Dallas/Fort Worth Intl, TX	DFW	ASW	2008	1		7	5	13	1.94	0
			2009			14	3	17	2.67	0
			2010			9	4	13		1
			2011			2	2	4	.61	2
			2012			7	4	11	1.7	2
Dallas Love Field, TX	DAL	ASW	2008			5	4	9	3.89	0
			2009			2	11	13	7.35	1
			2010			2	4	6		8
			2011			6	3	9	5.05	2
			2012			3	4	7	3.95	2

Texas (continued)

Airport, City	Airport Code	Region	Fiscal Year	Severity A	Severity B	Severity C	Severity D	Total RI's	Annual RI Rate	Other Events, Non-RI's
David Wayne Hooks Memorial Airport, Houston, TX	DWH	ASW	2008				4	4	1.86	0
			2009				2	2	.9	0
			2010			3		3		0
			2011		1		1	2	1.06	0
			2012				7	7	4.26	0
Denton Muni, TX	DTO	ASW	2008				1	1	.8	0
			2009					0	.	1
			2010				1	1		0
			2012				1	1	.64	2
Easterwood Field, College Station, TX	CLL	ASW	2009				1	1	2.05	0
East Texas Regional, Longview, TX	GGG	ASW	2008				3	3	3.25	0
			2009				3	3	3.59	0
			2010			1	1	2		0
			2011			2	2	4	5.57	0
			2012				1	1	1.42	0
El Paso Intl, TX	ELP	ASW	2008			2	2	4	4.	0
			2009				1	1	1.03	0
			2012			1	2	3	3.13	0

Texas (continued)

Airport, City	Airport Code	Region	Fiscal Year	Severity A	Severity B	Severity C	Severity D	Total RI's	Annual RI Rate	Other Events, Non-RI's
Fort Worth Alliance Airport, TX	AFW	ASW	2008				1	1	1.04	0
			2010				1	1		2
			2011				1	1	.85	0
Fort Worth Meacham Intl, TX	FTW	ASW	2008			1	1	2	1.6	1
			2009		1	1	8	10	8.16	0
			2010			1	1	2		0
			2011				1	1	1.34	0
			2012			1	3	4	4.73	1
Fort Worth Spinks Airport, TX	FWS	ASW	2011			1		1	1.79	0
			2012				2	2	3.32	0
George Bush Intercontinental/ Houston Airport, Houston, TX	IAH	ASW	2008			3	3	6	1.01	0
			2009			1	1	2	.37	0
			2010			8	1	9		0
			2011			9		9	1.69	0
			2012			4		4	.77	0
Georgetown Muni, TX	GTU	ASW	2009			1		1	1.57	0
			2010					0		1
			2012			1	2	3	4.45	5

Texas (continued)

Airport, City	Airport Code	Region	Fiscal Year	Severity A	Severity B	Severity C	Severity D	Total RI's	Annual RI Rate	Other Events, Non-RI's
Grand Prairie Muni, TX	GPM	ASW	2008			1		1	.99	0
			2009				1	1	1.21	0
			2011					0	.	1
			2012				2	2	3.01	0
Laredo Intl, TX	LRD	ASW	2009				1	1	2.06	0
			2010			1		1		0
			2011				1	1	1.48	0
			2012				2	2	2.23	0
Lone Star Executive, Houston, TX	CXO	ASW	2010			1	1	2		0
			2011				3	3	5.03	4
			2012			3	6	9	15.72	4
Lubbock Preston Smith Intl, TX	LBB	ASW	2008			1	5	6	7.72	1
			2009				3	3	3.88	0
			2010				4	4		0
			2011				3	3	4.01	1
			2012				1	1	1.49	1
McAllen Miller Intl, TX	MFE	ASW	2011			1		1	1.53	0
			2012				1	1	1.6	0

Texas (continued)

Airport, City	Airport Code	Region	Fiscal Year	Severity A	Severity B	Severity C	Severity D	Total RI's	Annual RI Rate	Other Events, Non-RI's
Midland Intl, TX	MAF	ASW	2008			1	1	2	2.36	0
			2009				2	2	3.07	1
			2010			1	4	5		0
			2011			1	8	9	12.08	0
			2012			2	1	3	4.21	0
New Braunfels Muni, TX	BAZ	ASW	2010				2	2		0
			2011				6	6	17.87	1
			2012				1	1	3.53	0
San Antonio Intl, TX	SAT	ASW	2008			2	5	7	3.13	0
			2009			3	7	10	5.14	0
			2010			5	11	16		0
			2011			5	9	14	7.81	2
			2012			2	2	4	2.24	0
San Marcos Muni, TX	HYI	ASW	2012			2		2	3.3	0
Scholes Intl at Galveston Airport, TX	GLS	ASW	2012			3	4	7	27.24	1
Southeast Texas Regional, Beaumont, TX	BPT	ASW	2009				1	1	3.7	0
			2010				3	3		0
			2011				1	1	4.57	1

Texas (continued)

Airport, City	Airport Code	Region	Fiscal Year	Severity A	Severity B	Severity C	Severity D	Total RI's	Annual RI Rate	Other Events, Non-RI's
Stinson Muni, San Antonio, TX	SSF	ASW	2012				1	1	.87	0
Sugar Land Regional, Houston, TX	SGR	ASW	2012				1	1	1.43	0
TSTC Waco Airport, TX	CNW	ASW	2008			2		2	5.68	1
			2010				1	1		0
Tyler Pounds Regional, Tyler, TX	TYR	ASW	2008				1	1	1.78	0
			2011				1	1	2.17	0
			2012				1	1	2.39	2
Valley International Airport, Harlingen, TX	HRL	ASW	2008			1		1	1.79	0
			2009					0	.	1
			2010			1	2	3		0
			2011				1	1	1.92	0
			2012				6	6	12.59	1
Victoria Regional, TX	VCT	ASW	2010				1	1		0
			2012				2	2	3.52	0

Texas (continued)

Airport, City	Airport Code	Region	Fiscal Year	Severity A	Severity B	Severity C	Severity D	Total RI's	Annual RI Rate	Other Events, Non-RI's
Waco Regional, TX	ACT	ASW	2009			1		1	3.22	0
			2010				2	2		2
			2011				2	2	6.34	1
			2012				1	1	2.99	3
William P Hobby Airport, Houston, TX	HOU	ASW	2008			4	5	9	4.02	0
			2009			5	4	9	4.4	0
			2010	1		7	10	18		0
			2011			2	2	4	1.99	0
			2012			11	3	14	7.1	1

Utah

Airport, City	Airport Code	Region	Fiscal Year	Severity A	Severity B	Severity C	Severity D	Total RI's	Annual RI Rate	Other Events, Non-RI's
Ogden-Hinckley Airport, Ogden, UT	OGD	ANM	2009				1	1	1.13	0
			2010				1	1		0
			2011			2	2	4	5.87	0
			2012				2	2	3.11	0

Utah (continued)

Airport, City	Airport Code	Region	Fiscal Year	Severity A	Severity B	Severity C	Severity D	Total RI's	Annual RI Rate	Other Events, Non-RI's
Provo Muni, UT	PVU	ANM	2008				3	3	2.43	0
			2009					0	.	1
			2010			4	5	9		0
			2011				2	2	3.06	0
			2012		1		4	5	6.67	0
Salt Lake City Intl, UT	SLC	ANM	2008				4	4	.99	0
			2009				5	5	1.34	0
			2010			8	4	12		0
			2011			8	5	13	3.56	5
			2012			2	3	5	1.52	2

Vermont

Airport, City	Airport Code	Region	Fiscal Year	Severity A	Severity B	Severity C	Severity D	Total RI's	Annual RI Rate	Other Events, Non-RI's
Burlington Intl, VT	BTV	ANE	2008			1	1	2	2.1	0
			2009			2	1	3	3.96	0
			2011			1	3	4	5.19	0
			2012			3	1	4	5.2	0

Virginia

Airport, City	Airport Code	Region	Fiscal Year	Severity A	Severity B	Severity C	Severity D	Total RI's	Annual RI Rate	Other Events, Non-RI's
Lynchburg Regional/ Preston Glenn Field, VA	LYH	AEA	2008			1		1	1.62	0
Manassas Regional/Harry P. Davis Field, VA	HEF	AEA	2008				1	1	.87	0
Newport News/ Williamsburg Intl, Newport News, VA	PHF	AEA	2010				1	1		0
			2010				1	1		0
			2011				2	2	1.85	0
			2012				1	1	.95	0
Norfolk Intl, VA	ORF	AEA	2008				1	1	.85	0
			2010				3	3		0
			2011			3	3	6	6.52	0
			2012			2	4	6	6.88	1
Richmond Intl, VA	RIC	AEA	2008				1	1	.82	0
			2009				3	3	2.78	0
			2010				3	3		1
			2011				2	2	1.92	0
			2012				1	1	1.	0
Roanoke Regional/ Woodrum Field, VA	ROA	AEA	2008				1	1	1.45	0

Virgin Islands

Airport, City	Airport Code	Region	Fiscal Year	Severity A	Severity B	Severity C	Severity D	Total RI's	Annual RI Rate	Other Events, Non-RI's
Cyril E King Airport, Charlotte Amalie, VI	STT	ASO	2010			1		1		0

Washington

Airport, City	Airport Code	Region	Fiscal Year	Severity A	Severity B	Severity C	Severity D	Total RI's	Annual RI Rate	Other Events, Non-RI's
Bellingham Intl, WA	BLI	ANM	2008			1		1	1.51	0
Boeing Field/King CO Intl, Seattle, WA	BFI	ANM	2008				1	1	.33	0
			2009				2	2	.75	0
			2010				2	2		0
			2011			1		1	.42	1
			2012			1	1	2	1.01	0
Felts Field, Spokane, WA	SFF	ANM	2008			1		1	1.51	1
			2009			1		1	1.52	0
			2011			1		1	1.72	0
Grant CO Intl, Moses Lake, WA	MWH	ANM	2009			1	1	2	2.9	1
			2010			1	1	2		0
			2011			1		1	1.76	0

Washington (continued)

Airport, City	Airport Code	Region	Fiscal Year	Severity A	Severity B	Severity C	Severity D	Total RI's	Annual RI Rate	Other Events, Non-RI's
Olympia Regional, WA	OLM	ANM	2008					0	.	1
			2009				1	1	1.45	0
			2010					0		1
			2011		1		1	2	4.32	0
			2012			1		1	1.61	0
Pearson Field, Vancouver, WA	VUO	ANM	2011				3	3		1
Renton Muni, WA	RNT	ANM	2009			1	1	2	2.4	0
			2010				1	1		6
Seattle-Tacoma Intl, WA	SEA	ANM	2008			5	2	7	1.99	1
			2009			4	2	6	1.87	2
			2010			6	3	9		7
			2011			7	1	8	2.54	2
			2012			2	2	4	1.28	1
Snohomish CO (Paine Field), Everett, WA	PAE	ANM	2008			1	2	3	2.11	0
			2009			7	5	12	10.52	0
			2010			1	2	3		1
			2011				1	1	.9	2
			2012			2	1	3	2.67	0

Washington (continued)

Airport, City	Airport Code	Region	Fiscal Year	Severity A	Severity B	Severity C	Severity D	Total RI's	Annual RI Rate	Other Events, Non-RI's
Spokane Intl, WA	GEG	ANM	2008			1		1	1.01	0
			2010			1	1	2		0
			2011				1	1	1.31	0
			2012			1	2	3	4.4	0
Tacoma Narrows Airport, WA	TIW	ANM	2008					0		1
			2009			1	1	2	3.73	0
			2011				1	1	1.82	0
Tri-Cities Airport, Pasco, WA	PSC	ANM	2008			2	2	4	6.8	0
			2009				1	1	2.3	0
			2010			1	1	2		1
			2011				1	1	1.91	0
			2012			1		1	1.91	0
Walla Walla Regional, WA	ALW	ANM	2009				2	2	6.5	0
			2010			1	1	2		2
			2012				1	1	4.1	1
Yakima Air Terminal/ McAllister Field, WA	YKM	ANM	2009				2	2	4.07	2
			2012					0		1

West Virginia

Airport, City	Airport Code	Region	Fiscal Year	Severity A	Severity B	Severity C	Severity D	Total RI's	Annual RI Rate	Other Events, Non-RI's
Mid-Ohio Valley Regional, Parkersburg, WV	PKB	AEA	2008			1	1	2	5.9	0
Tri-State/Milton J. Ferguson Field, Huntington, WV	HTS	AEA	2010				1	1		0
			2011					0	.	1
			2012				1	1	6.31	0
Wheeling Ohio CO Airport, WV	HLG	AEA	2012			1	1	2	4.6	0
Yeager Airport, Charleston, WV	CRW	AEA	2012					0	.	1

Wisconsin

Airport, City	Airport Code	Region	Fiscal Year	Severity A	Severity B	Severity C	Severity D	Total RI's	Annual RI Rate	Other Events, Non-RI's
Austin Straubel Intl, Green Bay, WI	GRB	AGL	2008			1		1	1.13	0
			2011				2	2	2.78	0
			2012			1		1	1.5	0
Central Wisconsin Airport, Mosinee, WI	CWA	AGL	2008				1	1	4.5	0

Wisconsin (continued)

Airport, City	Airport Code	Region	Fiscal Year	Severity A	Severity B	Severity C	Severity D	Total RI's	Annual RI Rate	Other Events, Non-RI's
Chippewa Valley Regional, Eau Claire, WI	EAU	AGL	2009				1	1	3.17	1
			2012				1	1	3.73	0
Dane CO Regional-Truax Field, Madison, WI	MSN	AGL	2008			2	2	4	3.53	0
			2009			3	3	6	6.05	0
			2010			2	1	3		0
			2011			2	2	4	4.75	1
			2012			4	5	9	10.61	1
General Mitchell Intl, Milwaukee, WI	MKE	AGL	2008	1		6	7	14	7.25	1
			2009			5	3	8	4.87	0
			2010			3	4	7		2
			2011			3	1	4	2.2	2
			2012	1		3	1	5	3.53	2
Kenosha Regional, WI	ENW	AGL	2010				3	3		0
			2011				2	2	4.14	0
La Crosse Muni, WI	LSE	AGL	2010			1		1		1
Lawrence J Timmerman Airport, Milwaukee, WI	MWC	AGL	2009				1	1	2.71	0
			2011				1	1	3.69	0

Wisconsin (continued)

Airport, City	Airport Code	Region	Fiscal Year	Severity A	Severity B	Severity C	Severity D	Total RI's	Annual RI Rate	Other Events, Non-RI's
Outagamie CO Regional, Appleton, WI	ATW	AGL	2008				2	2	4.62	1
			2009				1	1	2.89	2
			2011	1				1	2.84	0
Southern Wisconsin Regional, Janesville, WI	JVL	AGL	2008			1		1	2.14	0
Waukesha CO Airport, WI	UES	AGL	2008					0	.	1
			2009			1	1	2	3.26	0
			2011			1		1	1.76	1
Wittman Regional, Oshkosh, WI	OSH	AGL	2008			1	2	3	3.68	0
			2009	1		1	1	3	3.28	0
			2010				3	3		4
			2011				1	1	1.37	0

Wyoming

Airport, City	Airport Code	Region	Fiscal Year	Severity A	Severity B	Severity C	Severity D	Total RI's	Annual RI Rate	Other Events, Non-RI's
Jackson Hole Airport, Jackson, WY	JAC	ANM	2008				1	1	3.23	1
			2009				1	1	3.43	0
			2010				1	1		0
			2011			1		1	3.93	0
Natrona CO Intl, Casper, WY	CPR	ANM	2008			1	2	3	7.71	0
			2009			2		2	5.31	0
			2011			1		1	2.61	0
			2012			1		1	2.59	0

U.S. Department of Transportation
Federal Aviation Administration

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Washington, DC 20591

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