Federal Aviation Administration

National Runway Safety Report 2013 – 2014

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http://www.faa.gov/go/nrsp/

Contents

A Note from the Administrator

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Administrator, Federal Aviation Administration

The U.S. air traffic system is experiencing the safest period in its history to date, boasting **the safest and most efficient airspace in the world.**

Our success reinforces the Federal Aviation Administration's (FAA) mission to maintain its global leadership in the operation of safe and efficient air navigation services, while continuously striving to reach the next level of aviation safety and efficiency.

Runway safety is one of the FAA's highest priorities. This National Runway Safety Report 2013-2014 highlights our runway safety initiatives and the improvement of surface environments since 2012, demonstrating how we use safety management principles to produce comprehensive corrective actions in response to the increasing complexity of today's aerospace system. In this report, we also analyze our progress and establish current runway safety priorities across the agency, as well as indicate innovative programs and techniques implemented for runway safety in efforts to reduce the rate and severity of incidents within the surface environment.

The FAA is able to develop corrective actions based on data collected from its Safety Management System (SMS). Applying the proactive SMS method, we collect valuable safety data from a number of sources, such as automated traffic data gathering tools and voluntary safety reports, to identify emerging risks. We then find potential safety hazards and assess the risks in a data-driven process that helps identify root causes and precursor events that lead to accidents. By putting in place corrective actions and robust monitoring plans, we have the ability to fix the problem. The ***COLLECT-FIND-FIX*** strategy is embedded in the FAA SMS, and ensures that our actions focus on the highest priorities and most cost effective initiatives.

Perhaps the most significant solution in runway safety in the last ten years was completed in 2014 when new requirements and tools were developed for non-intersecting Converging Runway Operations (CRO) — a conflict that arises when an arriving aircraft is forced to do a go-around while another aircraft is simultaneously departing on a runway that has a converging flight path. Through data analysis, listening to user concerns and consulting with industry partners, the FAA developed a solution that mitigates the risk of loss of separation while also providing air traffic controllers with tools that maintain operational efficiency.

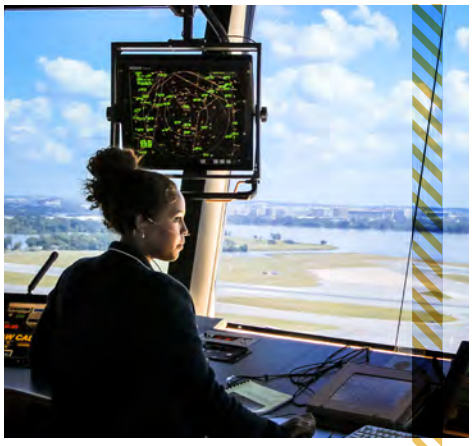
With the recent introduction of an enhanced tool for risk assessment called Surface Risk Analysis Process (S-RAP), the FAA hopes to establish a baseline by the end of FY2016, allowing the agency to analyze two years' worth of data. This tool includes all surface losses of separation, not just runway incursions (RI), and has the ability to examine surface incidents that would not have been analyzed under the previous assessment method. In collaboration with stakeholders, the Runway Safety Group (RSG) is currently reviewing the results of the S-RAP demonstration and developing a surface safety performance metric action plan.

Thanks to the SMS, data collected from automated systems and mandatory and voluntary reporting efforts has uncovered more potential safety hazards. For example, the reported number of less serious RIs has risen since 2007. With the implementation of the SMS and an improved reporting culture, the total number of reported RIs increased in FY2012. The FAA is taking full advantage of this new data to provide a clearer picture of safety risks in the aerospace system.

In a collaborative approach, the FAA works with industry partners to develop and deploy safety solutions that benefit both stakeholders and the flying public. For example, the FAA worked with the MITRE Corporation to produce a prototype mobile device application that tracks movements on the airfield and alerts pilots when approaching the runway environment. After testing the idea with pilots, the FAA and MITRE decided to make the software available to commercial vendors.

The FAA will continue to manage safety using a proactive, data-driven, risk-based approach, and focus on improvements in runway safety alongside other system components. The FAA must continue to support a comprehensive safety culture and understand the critical role of the SMS in the agency's systematic approach to continuous safety improvement.

Michael P. Huerta, Administrator



Overview

The FAA is responsible for the safest, most complex air traffic system in the world. Runways signal the beginning and end of that system for all passengers. Yet the surface environment at the airport is one of the most challenging, with multiple moving parts and overlapping jurisdictions.

FAA employees manage this dynamic environment using procedures, technology and communication to safely and expeditiously orchestrate thousands of take-offs and landings every day. Meanwhile, the FAA collects data on the runway environment through electronic systems and reporting programs as a primary step in its runway safety program. Airports in the U.S. 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.

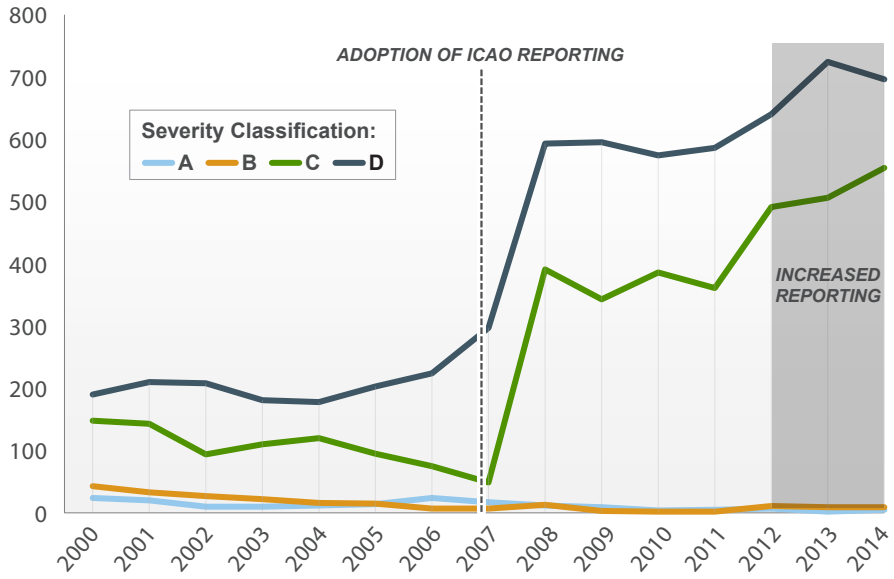
The FAA Air Traffic Organization's (ATO's) RSG, acts as the steward of the FAA's Runway Safety Program by working with other FAA organizations, the aviation community and industry groups to improve safety. Much of the work of improving runway safety is done through internal and external governance structures to ensure that broad perspectives and the best expertise remains an integral piece of the program. The challenges of advancing runway safety in the future with the introduction of NextGen technologies and increasing complexity is addressed in Section 1. Section 2 contains a listing of all industry, internal and international organizations that contribute to the FAA mission of runway safety. These groups help FAA develop and execute a strategic plan for runway safety.

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 analyzes the most significant events — employing the model of ***COLLECT-FIND-FIX.***

In 2012, the FAA introduced new mandatory safety reporting orders which allow the agency to collect more data than ever before.[1] As a result, incident reporting increased, and data from FY2013 – FY2014 reflects the impact of these new orders (Figure 1). The FAA also uses voluntary safety reporting programs for pilots, air traffic controllers and others as another source for valuable data and insight into the reasons why the incidents occur. Data collection accomplishments and activities for FY2013 – FY2014 are included in Section 3, ***COLLECT.*** More data improves the FAA's ability to ***FIND,*** understand and analyze safety problems in the National Airspace System (NAS). This process often uses safety risk management (SRM) tools to understand the hazard and assess the associated risks. Activities and accomplishments for identifying and analyzing safety problems are included in Section 4, ***FIND.*** Finally, the ultimate objective of the Runway Safety Program is to ***FIX*** safety problems before an incident or accident occurs. Activities and accomplishments that resolve or fix aviation safety issues are included in Section 5, ***FIX.***

The ***COLLECT-FIND-FIX*** strategy is called "proactive safety management." It provides a tactical safety approach to everyday activities for the entire agency. The FAA collects data through reports and automated systems, compiles the data, analyzes it, finds hazards and then takes steps to fix them proactively and collaboratively, with the involvement of the stakeholders who operate the NAS.

Figure 1.
Reported Runway Incursions: 2000–2014



[1] *FAA JO 7210.632, ATO Occurrence Reporting; FAA JO 7210.633, ATO Quality Assurance Program; FAA JO 7210.634, ATO Quality Control; and FAA JO 7200.20, Voluntary Safety Reporting Programs*

Key Accomplishments in FY2013 – FY2014

ESTABLISHED new requirements for conducting CRO, procedures for alternating runway configurations at 137 airports, and, at 24 high-priority airports, adopted and implemented Arrival Departure Window (ADW), a site-specific air traffic control decision-support tool.

INTRODUCED new mandatory safety management process and guidance.

ACHIEVED 44 percent reduction in the number of serious RIs since 2008, after the reporting requirements changed to the International Civil Aviation Organization (ICAO) standard.

IMPLEMENTED local safety councils (LSCs) at every FAA facility through *FAA Order JO 7200.21 (3/5/13), Partnership for Safety (PFS) Program,* which defined policy and procedures to facilitate the identification and mitigation of hazards at the local level.

COMPLETED in-depth analyses of 48 RI events with the industry. The Root Cause Analysis Team (RCAT) then forwarded 114 recommendations to the Runway Safety Council (RSC).

COMPLETED initial deployment of the Runway Excursion Database.

BEGAN USING the S-RAP tool for risk assessment.

COMPLETED RSA improvements for 51 runways in FY2013 and FY2014, leaving only 39 more in 2015 to meet agency goals.

COMPLETED Engineered Materials Arresting System (EMAS) installations in Memphis, TN, Burke Lakefront in Cleveland, OH, San Francisco, CA, T.F. Green in Providence, RI and Addison, TX.

INCORPORATED an RI prevention tool for general aviation (GA) aircraft into the ForeFlight Mobile application.

COMPLETED runway status light (RWSL) installations at Orlando (MCO), Washington Dulles (IAD), Phoenix (PHX), Houston (IAH), Seattle (SEA), Las Vegas (LAS) and Charlotte (CLT).

CREATED graphical depictions of airport construction via the Notices to Airmen (NOTAM) system at: https://nfdc.faa.gov/xwiki/bin/view/NFDC/Construction+Notices. The Airport Construction Advisory Council (ACAC) communicated over 3,000 construction diagrams to stakeholders in 2013 and 2014.

DEVELOPED remedial training requirements for pilots who contribute to RIs.

1.0 Runway Safety Moving Forward

Today's aerospace enterprise is complex and technically demanding. The impact of evolving technology, rising traffic volumes and the implementation of the Next Generation Air Transportation System (NextGen) create an environment where assumptions must be continually tested and validated in order to maintain safety risks at acceptable levels. To address these challenges, the FAA is committed to building upon the ability of the FAA SMS to identify the issues, use multiple data streams to analyze the issues, and then devise corrective actions that are measured and monitored.

The FAA is consolidating its move towards a corporate management approach to maintain safety at the nation's airports. Safety is everyone's business, and multiple stakeholders come together on the runways. By developing a corporate approach, the FAA is pooling together agency-wide coordination, budgets and resources to prioritize and identify NAS-wide risk reduction runway safety initiatives. In addition, the RSG is aligning the program with the shared services model employed by the ATO. This will allow the RSG to maximize its present resources by equitably distributing roles and responsibilities across the NAS.

Safety management requires examining the system as a whole and understanding the safety implications of the interactions of all parts and subsystems. Previous runway safety reports primarily emphasized a single outcome – the RI. However, a systems approach to safety recognizes that any undesirable operational state or safety event can produce multiple outcomes. Maintaining safety on the nation's runways requires an integrated, risk-driven approach.

As part of proactive safety management, the FAA will explore new risk-based operational metrics that support the identification of hazards that interact with real, potential and emerging risks among system components. Operational upsets, safety incidents and accidents are each preceded by conditions and events that contribute to the specific event. Future efforts will recognize and address these events and conditions as upstream precursors. In turn, each precursor event may well prompt a new set of metrics to track and measure.

Developing a corporate approach to surface safety that embraces the concept of using multiple sources of data from operators, airlines and regulators to identify an expanding number of upstream precursors to events is a critical step towards a proactive and predictive SMS. In addition to being data-driven, runway safety management also relies on outreach activities to "Make Aviation Safer and Smarter." It will enable a system-wide increase in safety and efficiency and will redefine our safety oversight model. The FAA continues to support SMS rollout within the industry, including the development of new surveillance and oversight models.

Finally, we sponsor outreach to facilitate the sharing and use of best practices and lessons learned among, and outside, aviation industry segments. The FAA continues to work with airports and others to build relationships that will create an environment of successful cooperation and trust in order to make lasting changes.

2.0 Runway Safety Governance

Virtually all safety programs require wide coordination among operational units. The FAA has determined that risk management initiatives are most effective when fully integrated into the operation and aggressively managed by the FAA's operating units. The FAA manages runway safety by leveraging a team within ATO's Safety and Technical Training. Using this team as the steward of its Runway Safety Program, the FAA has established governance organizations that integrate the broad perspective of users and aviation professionals. They provide direction for runway safety research, hazard assessment and the development and deployment of control measures.

2.1 National Governance Council

The National Governance Council was established by the FAA in May 2012 to aid the development of regional and local accountability. The ATO Vice President for Safety and Technical Training and the Regional Administrators meet quarterly to conduct a program review to ensure that all FAA organizations have effective programs to address identified runway safety deficiencies. The National Governance Council facilitates the exchange of runway safety data and trends and promotes an understanding of the integrated safety picture across the ATO, Flight Standards and Office of Airports leadership.

The purpose of this council is to:

- *Ensure regional initiatives and actions are being accomplished in the appropriate manner and timeframe*
- *Provide regional oversight to RIs*
- *Promote collaboration and enhanced communication among members*
- *Provide a forum by which appropriately-designated issues may be elevated for national review, as necessary*

ACCOMPLISHMENTS

Established National Governance Council

Initiated national review of airports to determine special emphasis airports in each region; Section 5.6

Developed an Executive Outreach Sourcebook

This forum allows Regional Administrators to highlight particular runway safety concerns. Some trends elevated to the National Governance Council during FY2013 – FY2014 include taxiing on runways and the need for clarification around the definition of an RSA. The need to do more with runway excursions (REs) was also elevated at this forum and the Runway Excursion Database was created in FY2013. Additionally, the Runway Safety Sourcebook was created to leverage other FAA outreach activities and ensure that runway safety is addressed at every opportunity.

The National Governance Council advances corporate solutions to address safety at regional airports and focus on those airports with the highest number of incidents. The development of the Runway Safety Focus Airport Program later in 2014 was based on the application of risk-based decision-making to runway safety. Specific accomplishments that came about because of this enhanced national focus are listed in Section 5.6, Runway Safety Program Accomplishments.

ACCOMPLISHMENTS

Taxiing on runways; Section 5.10

RSA clarification; Section 5.8

Created the Runway Excursion Database; Section 3.3

2.2 Regional Governance Council

Each FAA Regional Administrator established a Regional Governance Council whose members include the Local Runway Safety Program Manager, an Airports Division Manager, a Flight Standards Division Manager and the ATO Director of Air Traffic Operations. The intent of the Regional Council is to ensure regional initiatives and actions are accomplished in the appropriate manner and timeframe.

The Regional Governance Council identifies certain airports as special emphasis airports or airports designated to receive a Regional Runway Safety Action Team (RRSAT) meeting.

The effectiveness of this process has been illustrated through necessary changes to airport geometry identified and accomplished at many airports including North Las Vegas Airport (VGT), Evansville Airport (EVV) and John F. Kennedy Airport (JFK). Procedural changes have reduced RIs at airports such as Deer Valley (DVT), Seattle Tacoma International (SEA) and Honolulu International (HNL). Seeing safety improvements as a result of this type of heightened focus further supported the creation of the National Runway Safety Focus Airport Program discussed in Section 5.5.

ACCOMPLISHMENTS

Initiated changes to airport geometry at North Las Vegas Airport (VGT), Evansville Airport (EVV) and John F. Kennedy Airport (JFK)

2.3 Runway Safety Council (RSC)

The RSC was established in 2008 by the FAA Administrator following the Call to Action for Runway Safety. The RSC is a joint effort between the FAA and industry that uses a risk-based systems approach to provide effective solutions to reduce risk during surface operations. The RSC identified a goal to reduce serious (Category A and B) RIs by 25 percent in five years. That goal was met in 2013. The council includes officials from the:

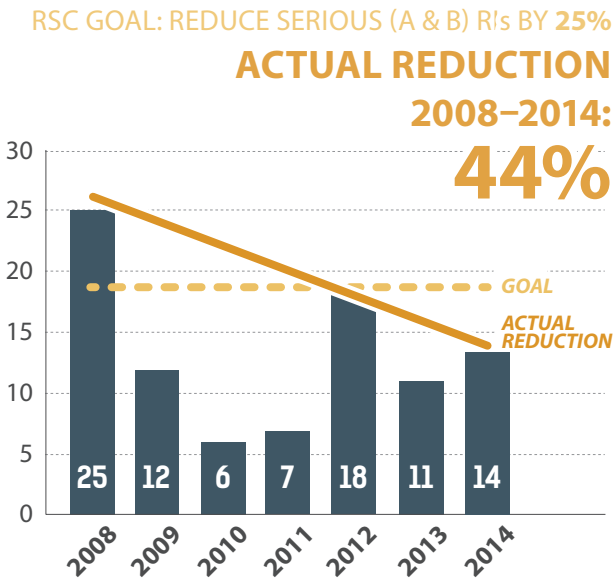
- *FAA*
- *National Air Traffic Controllers Association (NATCA)*
- *Professional Aviation Safety Specialists*
- *Air Line Pilots Association (ALPA)*
- *Airlines for America*

- *American Association of Airport Executives (AAAE)*
- *Airports Council International – North America*
- *Aircraft Owners and Pilots Association (AOPA)*
- *National Association of Flight Instructors*
- *National Business Aviation Association (NBAA)*
- *Regional Airline Association*

ACCOMPLISHMENT

Reduced serious RIs by **44** percent since 2008

Figure 2.
RSC Goals and A & B Runway Incursions



The RSC chartered the RCAT to investigate and analyze severe RIs and determine root causes. The team is made up of technical representatives from the RSC member organizations. The team reviews data and information from all aspects of an event with a "systems" perspective to identify root causes. Information related to pilots, controllers, drivers and/or pedestrians, as well as weather, airport geometry, procedures, training and construction may be factors in an event. After the root causes are identified, the RCAT develops recommendations to the RSC for potential mitigations to improve runway safety. If the recommendations are accepted by the RSC, the council assigns actions to the FAA and/or the industry group best able to address the identified root causes and reduce the risk of RIs. The council tracks actions to make sure progress is made.

In FY2013 and FY2014, the RCAT analyzed 36 RI events and made recommendations to the RSC. As a result, 57 actions were assigned to various council members. Forty-four of those actions have been completed. All assigned action items are monitored and tracked in the Runway Safety Tracking System (RSTS). Some of the recommendations in the implementation and monitoring phases include:

- *Controller training related to tower scanning, distractions, hearback and readback of clearances, high energy runway crossings and using runways as taxiways*
- *Revision of the Pilot Handbook of Aeronautical Knowledge to add an appendix on RI avoidance, updates to the written and practical test standards for all pilot certificates, as well as designated pilot examiner (DPE) training and flight school requirements*
- *Identification of memory aids as a common root cause across several events, resulting in the issue being included as part of the 2015 ATO Top 5 list*

ACCOMPLISHMENTS

Analysis of **36** RI events

57 recommendations for the RSC

44 recommendations completed

Controller training developed

Revision of the Pilot Handbook of Aeronautical Knowledge

Identification of memory aids as hazards

2.4 Surface Safety Initiatives Team (SSIT)

SSIT is a cross-functional group of FAA stakeholders that are assigned to resolve known or anticipated surface safety related issues. The team meets bi-weekly and is led by co-chairs from the Office of Airports and ATO Safety and Technical Training. SSIT includes representatives from NATCA, NextGen, ATO Program Management Organization, ATO Systems Operations Services, ATO Mission Support, Aviation Safety, the Administrator for Policy International Affairs and Environment and the Office of Environment and Energy.

In March 2014, SSIT completed a project plan that included safety reviews and recommendations by the Comprehensive Airport Review and Assessment (CARA) teams regarding ten U.S. airports. The plan consisted of a safety assessment to identify and prioritize operational shortfalls at each airport, based on local needs and options for addressing shortfalls.

An Alternatives Analysis and Benefits Case Team (AAT) developed a concept of operations, program requirements, alternatives analysis, and benefits cases for site specific solutions (both business and technical), based on identified operational shortfalls and priorities.

ACCOMPLISHMENTS

SSIT Project Plan developed

Comprehensive Airport Review Plans (CARPs) completed for four airports: Boston (BOS), Dallas Fort-Worth (DFW), San Diego (SAN) and Reno (RNO)

Originally, SSIT focused their efforts on airports that had been candidates for the installation of RWSL or had benefited from research into low-cost ground surveillance. Four airports, Boston (BOS), Dallas Fort-Worth (DFW), San Diego (SAN) and Reno (RNO), elected to participate in the SSIT process. All four airports have completed their CARPs. The AAT is underway for BOS, and the remaining three airports' AATs are planned. It is anticipated that the support teams will complete the assessments, alternatives analysis and benefits cases for these airports by October 2015, as projected in the project plan.

ACTIVITY

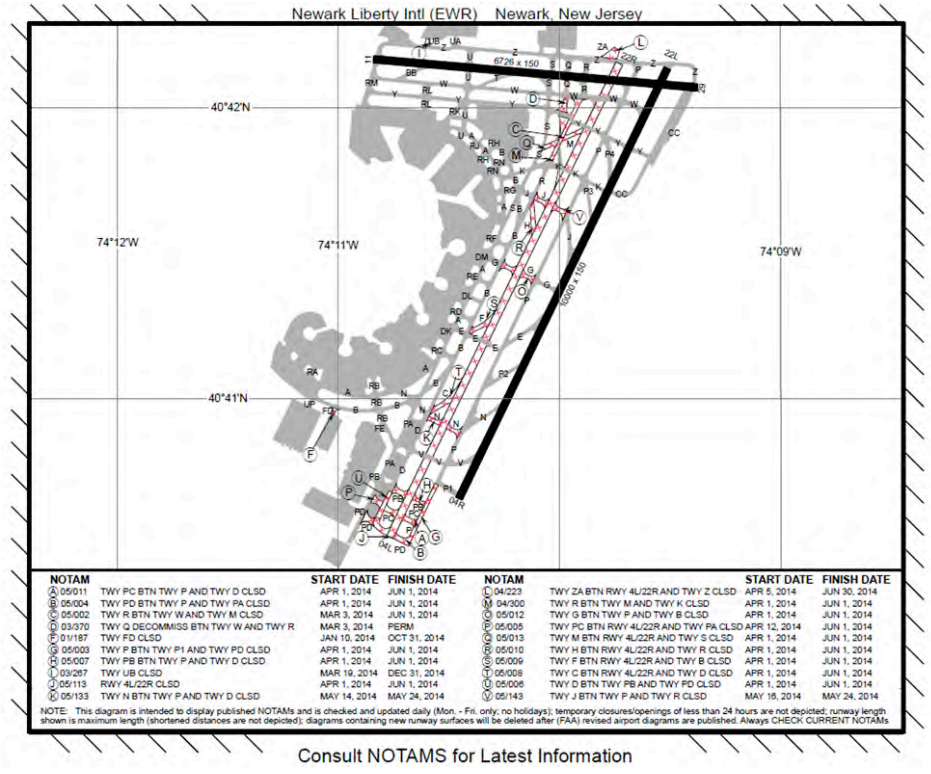
AAT underway for BOS

2.5 Airport Construction Advisory Council

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

Recognizing the risks associated with these hazards, the FAA created the ACAC in April 2010. The ACAC was tasked with ensuring safety during airport construction activities. The ACAC consists of FAA and U.S. aviation industry professionals with diverse backgrounds and experience. It has grown to 15 core and associate members strategically positioned across the U.S. Members include various FAA lines of business, NATCA, ALPA, AOPA, NBAA and the Airline Dispatchers Federation.

Figure 3.
Construction Notice



The ACAC takes a multifaceted approach to mitigating the hazards associated with airport construction. Efforts target operations on runways shortened due to construction and situations where the combination of aircraft, construction vehicles, workers, broken pavement and other activities can create significant risk. Working with subject matter experts in the U.S. aviation industry, ICAO, and domestic and international aviation labor and professional organizations, the ACAC has developed a portfolio of initiatives designed to ensure that safety is maintained during airport construction:

- *Improved the visibility and accurate posting of nationwide capacity limits imposed by construction*
- *Collaborated with the Terminal Simulation System Program Office to ensure that visual database changes are available to support airport configuration changes following construction*
- *Amended the Air Traffic Controller Handbook to clarify phraseology and to eliminate the term "full length" from clearances and add "shortened" to clearances when a runway's length is different than published*
- *Revised the Automatic Terminal Information Service (ATIS) processes to engage the council in the formulation and prioritization of ATIS messages*
- *Developed a runway construction safety website, a compilation of best practices and a runway construction checklist (www.faa.gov/go/runwayconstruction)*
- *Improved the construction checklist*
- *Created graphical depictions of airport construction via the NOTAM system (https://nfdc.faa.gov/xwiki/bin/view/NFDC/Construction+Notices). The ACAC communicated over 3,000 construction diagrams to stakeholders in 2013 and 2014*
- *Provided assistance to international stakeholders in revising policy necessary to improve safety during periods of construction*
- *Developed orange construction signs (Section 5.13.2)*
- *Clarified the differences between a displaced threshold and a relocated threshold*

ACCOMPLISHMENT

Air Traffic Control Handbook amendment to clarify phraseology and to eliminate the term "full length" from clearances and add "shortened" to clearances when a runway's length is different than published

2.6 Air Traffic Safety Action Program

ATO's Voluntary Safety Reporting Programs are modeled after the very successful Aviation Safety Action Programs (ASAPs) used in the aviation industry. Over 69 aviation companies have operating ASAP programs. ASAP can be traced back to the early 1970s and a voluntary safety reporting program at United Airlines. These programs use employee input to identify significant safety concerns and issues, operational deficiencies, non-compliance with regulations, deviations from company policies and procedures, and unusual safety events. Voluntary safety reporting programs are part of a positive, vibrant safety culture.

The Air Traffic Safety Action Program (ATSAP) is a non-punitive program designed to encourage transparency in the realm of air traffic. The intent is to identify and report all events that may or did lead to a breakdown in safety or increase risk to air traffic operations.

As part of our overall safety goals, ATSAP has established a system for controllers and other employees to voluntarily identify and report safety and operational concerns. The collected information is reviewed and analyzed to facilitate early detection and improved awareness of operational deficiencies and adverse trends. The information specified in employee reports is used to identify the root causes and determine appropriate remedial actions which are then monitored for effectiveness. This process promotes collaboration between employee workgroups and management for the early identification of hazards and to maintain a proactive approach regarding safety concerns and corrective action recommendations.

The ATSAP Event Review Committee (ERC) is comprised of representatives from NATCA, the ATO and Air Traffic Safety Oversight. The ERC reviews all reports filed in ATSAP and through consensus makes determinations on the appropriate next steps to take.

In an effort to gain the big picture of risk in the system from a pilot and controller perspective, in 2010 the FAA launched the Confidential Information Share Program (CISP). The CISP is a product of ATSAP, allowing air traffic controllers' confidential reports to be shared with an airline's ASAP, and pilots' reports from our participating airline partners to be shared with ATSAP.

The following are examples of runway safety enhancements brought to light thanks to voluntary safety reporting. A list of runway safety improvements discovered and mitigated in collaboration with the ATSAP program is included in Appendix A.

ACCOMPLISHMENT: RUNWAY SAFETY AREA CLARIFICATION

ISSUE: ATSAP reports often describe events involving vehicles operating within, or in close proximity to, an RSA. Many of these reports indicate that the controllers and/or vehicle operators are unaware of the RSA boundaries, do not understand the other's responsibilities, or do not adequately communicate expectations. This confusion often involves whether or not the vehicles or personnel are authorized to be in or near the safety area; whether or not the runway should be closed or the controller should issue advisories; what type of aircraft can land when equipment such as mowers are operating near the runway within the RSA; or when aircraft should be "sent around" because of vehicles or personnel in the RSA.

RESOLUTION: A Mandatory Briefing Item (MBI) was drafted to identify ATC responsibilities when authorizing workers/equipment in RSAs. *FAA JO 7110.65 (1/8/15)* was amended to include language from the MBI. The Office of Airports met with Air Traffic Services and agreed that ATMs must enter into a Letter of Agreement (LOA) with the airport authority in regards to how workers and equipment would be allowed to enter into the RSA. An SRM panel took place on December 3, 2014 to determine if hazards may be associated with the LOAs. From the panel meeting, the Office of Airports agreed to work with Technical Operations and Air Traffic Services to develop a template that would be used for the LOAs.

ACTIVITY

Clarification and procedures for applying separation to a clear runway

ACCOMPLISHMENT: BOSTON TRACON NOTAM COORDINATION

ISSUE: Since May 2007, there were concerns relating to proper and complete coordination of airport opening, airport closing, runway opening and runway closing NOTAMs information between Lockheed Martin Automated Flight Service Station (AFSS) facilities and ATO field facilities. The required NOTAM coordination was not being disseminated to the Boston TRACON (A90). The NOTAM coordination between Lockheed Martin and ATO field facilities had been a long running issue with many attempts at correcting the problem. The failed/missing coordination introduced additional risk into the NAS.

RESOLUTION: Lockheed Martin personnel were trained on the correct interpretation of requirements, and the Flight Service Program Office will conduct periodic inspections to monitor compliance.

ACCOMPLISHMENT: O'HARE INTERNATIONAL AIRPORT RUNWAY NOTAM CLOSED

ISSUE: Difficulty locating relevant NOTAMs on airport construction led to a hazardous situation at Chicago O'Hare International Airport (ORD). The runway length was shortened due to construction and pilots did not have accurate information on the usable runway length due to controller difficulty in locating NOTAMs. The significantly increased amount of NOTAMs at any airport undergoing runway or taxiway construction makes it difficult for controllers and crews to effectively read the notices and increases the likelihood of missing important information. The inability to sort the NOTAMs based on priority enhances the possibility of missing important information. The meaning of clearance "full-length" varies between crews and controllers.

RESOLUTION: Controllers were provided the capability to sort NOTAMs more easily. Aeronautical Information Manual (AIM) modernization includes digital NOTAMs which will provide even greater capabilities. The NOTAM site is in place at ORD and called "NOTAM Manager." No other issues are related to this specific Corrective Action Request (CAR), but the ACAC is working on national issues to preclude future events elsewhere.

ACCOMPLISHMENT: ALBUQUERQUE INTERNATIONAL SUNPORT WAIVER APPROVAL

ISSUE: At Albuquerque International Sunport (ABQ), the close proximity of Runways 8/26 and 12/30 creates a complex and confusing taxi/takeoff environment where aircraft commonly line up and attempt to depart on the wrong runway or associated taxiways. Controllers are often the last barrier that can prevent an aircraft from lining up on the wrong runway. The ERC identified the risk of wrong runway and taxiway departures, in addition to potential RIs.

RESOLUTION: ABQ Airport Traffic Control Tower (ATCT) received a waiver approval from Terminal Safety and Operations Support to use Line Up and Wait (LUAW) operations between sunset and sunrise without the restrictions outlined in *FAA JO 7210.3 (1/8/15).* The waiver request and subsequent approval was not to increase capacity or expedite departures, but an effort to improve the overall safety of the operation at ABQ.

ACCOMPLISHMENT: PRECISION RUNWAY MONITORING (PRM) ELECTRONIC SCAN (E-SCAN) SCOPES AT ATLANTA

ISSUE: The Eastern ERC received a number of reports from Atlanta TRACON (A80) regarding frequent failures of their Electronic Scan (E-SCAN) Precision Runway Monitoring (PRM) scopes. These scopes are critical components in conducting simultaneous approaches to Atlanta Hartsfield Airport's (ATL) parallel runways.

RESOLUTION: The committee decided to resolve the issue by obtaining serial numbers from the scopes, maintaining a serial number log, and recording screen details on the scope's console when any display freezes. The facility is providing Technical Operations with the details and logs, and established a system of moving faulty consoles into maintenance and replacing them with functional spares.

ACCOMPLISHMENT: ORLANDO SANFORD INTERNATIONAL AIRPORT STANDARD TERMINAL AUTOMATION REPLACEMENT SYSTEM (STARS) MAP UPDATED

ISSUE: A submitter reported that the STARS map was not updated accordingly when one of the Orlando Sanford International Airport (SFB) runways was extended by 1,400 ft. This poses a hazard because controllers trust that the data provided on the radar displays is accurate. Controller vectors and decisions are based on an aircraft's position relative to the runway. Inaccurate runway depiction on the controller's scope could result in an aircraft put at risk or a loss of separation.

RESOLUTION: The SFB STARS map was updated depicting the new runway length.

ACCOMPLISHMENT: RONALD REAGAN WASHINGTON NATIONAL AIRPORT NOTAM

ISSUE: Due to Ronald Reagan Washington National Airport (DCA) NOTAM confusion, pilots were unexpectedly and incorrectly faced with shortened runways in December 2013.

RESOLUTION: CISP received an informal request from Piedmont Airlines ERC regarding confusing NOTAMs on shortened runways at DCA. CISP contacted a DCA NATCA representative and a DCA support specialist who discovered incorrect NOTAMS and worked with Metropolitan Washington Airports Authority to cancel the misleading NOTAMs.

ACCOMPLISHMENT: PALM BEACH INTERNATIONAL AIRPORT RADIO TRANSMISSIONS

ISSUE: A submitter from Palm Beach International Airport (PBI) reported that while pilots were holding in position awaiting takeoff clearance on Runway 28R, they were unable to hear transmissions from Local Control on frequency 119.1. The same-runway operations between departures and arrivals were used on PBI Runway 28R. The inability to communicate properly and efficiently with departures sharing a runway with arrivals will lead to unexpected go-arounds or other undesired outcomes.

RESOLUTION: Frequency 119.1 was removed from service until the antenna was relocated on March 21, 2014. No issues have been reported since the antenna relocation.

ACCOMPLISHMENT: SEATTLE-TACOMA INTERNATIONAL AIRPORT WAKE TURBULENCE SEPARATION

ISSUE: Seattle-Tacoma International Airport (SEA) has three parallel runways: 16/34 R/L/C. 16L/C are separated by less than 2,500 feet; 16L/R are separated by more than 2,500 feet. The thresholds for the 16 runways are even, and the thresholds for the 34s are staggered. There was frequent confusion about how to apply wake turbulence separation properly when a heavy aircraft executes a missed approach and overflies the threshold. Confusion over loss of separation standards could lead to a loss of safety margins.

RESOLUTION: The facility decided the correct separation should be two minutes for the appropriate departure radar separation. A Comprehensive Electronic Data Analysis and Report (CEDAR) briefing has already been distributed. Briefings were completed in February 2014. Additionally, updates were included in the local tower training materials so that trainees understand the separation standards.

ACCOMPLISHMENT: JACKSON HOLE AIRPORT CLEARANCE DELIVERY

ISSUE: At Jackson Hole Airport (JAC), clearance delivery is provided by Jackson tower with a release provided by Salt Lake ARTCC (ZLC). In the LOA between ZLC and JAC tower, JAC tower must assign a runway appropriate Standard Instrument Departure (SID) to all departures. JAC tower generally clears aircraft via the SID then "as filed." On some occasions, the SID does not intersect/join with the "as filed" portion of the route. It is sometimes unclear what route the aircraft will fly. An unsafe situation could arise if the aircraft were to lose radio communication. To

complicate matters further, one particular departure procedure depicts routing which is rarely flown and confusing to pilots and controllers.

RESOLUTION: Multiple Adapted Departure Route (ADR)/ Adapted Departure and Arrival Routes (ADARs) were published for JAC. These ADR/ADARs eliminated confusion between the tower and the sector.

ACCOMPLISHMENT: SAFETY ALERT LOS ANGELES INTERNATIONAL AIRPORT

ISSUE: When the Western Service Area ERC became aware of taxiway construction at Los Angeles International Airport (LAX) that confused pilots, they suggested that LAX facility leadership contact the FAA's CISP and ask them to use their resources to alert pilots to the construction project and some of the hazards that are often encountered.

RESOLUTION: The CISP team sent an alert in August 2014 (Figure 4) to LAX and all participating airlines to bring the hazards to their attention. The reaction from the pilot community was swift and positive.

Figure 4.
LAX Safety Alert

2.7 Partnership for Safety (PFS) Program

PFS is a critical component of the ATO's SMS. It provides a bridge between the frontline employees and safety-critical data and analytic capabilities. Their mission is to facilitate the identification of risk through the use of collaborative LSCs comprised of employees and managers at facilities in the NAS. The goal is to empower frontline workers and airport leadership to identify and manage safety issues at the local level and easily share their findings and knowledge with others. These LSCs are instrumental when it comes to quickly identifying and mitigating surface safety risks at FAA towered airports.

PFS uses two primary tools to accomplish its mission:

- *The ATC InfoHub is an application that enhances knowledge sharing across users of the system; it allows users to input and share facility issues and solutions and lessons learned; LSCs can use the InfoHub to retrieve and upload information about the identification of local safety problems and actions taken to resolve them and employ these best practices in their facilities; currently, there are over 130 items published by 70 facilities in ATC InfoHub, including "Distractions in the Workplace" and "Opposite Direction Operations"*
- *The Safety Data Portal is a tool that makes accumulated safety data from all parts of the agency available to the local workforce; it is a resource that offers timely, detailed and accurate information for users to leverage in visualizing trends and predicting risk; the Safety Data Portal makes safety for each facility available to the LSCs; all FAA air traffic facilities received LSC training during FY2014; the creation of the Safety Data Portal helps LSCs identify safety trends at their facilities, make informed decisions on addressing issues identified by these trends, and collaboratively develop solutions to mitigate and monitor recognized hazards in the NAS*

In March 2013, the FAA issued *FAA Order JO 7200.21, PFS Program,* defining the policy and procedures for the ATO PFS Program. It identifies the responsibilities of individuals and organizations including the requirements, expectations, and policy under which the program operates. By utilizing collaboration to foster a safety culture of mitigating risk, PFS proactively improves the future of flight safety.

PFS's newest initiative, Safety Awareness Discussions, was launched in March 2015, after a year of beta testing beginning March 2014. Every month, the PFS team provides a national safety trends information package to air traffic managers. These packages are customized by the addition of facility-specific information from the LSC then briefed to all air traffic operation personnel.

2.8 The Commercial Aviation Safety Team (CAST)

As a member of CAST, the FAA is committed to developing mitigations for multiple aviation risks including issues associated with runway safety. CAST is a partnership between government and industry including the Department of Transportation, National Aeronautics and Space Administration (NASA), Transport Canada, the European Aviation Safety Agency, the Department of Defense, the Flight Safety Foundation, NATCA, ALPA, manufacturers, and regional, national, and international airline associations. CAST utilizes a data-driven, risk-centric, consensus approach to identifying and resolving significant commercial aviation safety issues.

The FAA has implemented several CAST safety enhancements, in collaboration with ICAO, regarding RI prevention. CAST was instrumental in helping the industry achieve a national goal in 2008 of reducing the commercial aviation fatality rate by over 80 percent in a single decade. It continues with a goal of further reducing the U.S. commercial aviation fatality rate by 50 percent from 2010 to 2025. In support of this goal, the CAST Joint Safety Analysis and Implementation Team has recently developed safety enhancement plans to reduce the risk of REs.

For FY2014, CAST committed to implementing eight RE safety enhancements. Some examples of the safety enhancements include, but are not limited to:

- *SE 215: To improve flight crew awareness of their landing distance margin and the factors and variables that can affect it, flight crews should assess landing performance based on conditions actually existing at time of arrival*
- *SE 218: To reduce landing overrun accidents, manufacturers should develop and implement on-board technologies to reduce or prevent landing overruns on new and existing airplane designs, as applicable and feasible*
- *SE 219: To reduce the risk of RE accidents, FAA ATO should develop or modify policies, procedures, and training related to the following factors that contribute to the risk of REs:*
  - *Airport arrival and departure configuration based on wind conditions*
  - *Wind reporting, measurement and use*
  - *Training of controllers on factors that contribute to the risk of RE, including wind conditions, runway conditions and unstable approaches*
- *SE 220: To improve flight crew awareness of airplane position on the runway and distance remaining during takeoff roll and landing rollout. Airport operators should add, as feasible, distance remaining signs on runways at Part 139 airports where Part 121 operations are conducted*
- *SE 221: To reduce the consequence of RE events, airport operators and the Office of Airports should modify policies and procedures in regards to the following:*
  - *Improvement of RSAs, including but not limited to implementation of EMAS, as appropriate*
  - *Improved communication between air traffic control, flight crews, and Aircraft Rescue and Fire Fighting (ARFF) personnel after occurrence of an RE event*
- *SE 222: To outline research to be conducted by the aviation community (government, industry, and academia) to enable development, implementation and certification of on-board aircraft system technologies to assess airplane braking action and provide the data in real time to the pilot, other aircraft crews, air traffic controllers and the airport operators*

2.9 International Leadership in Runway Safety

The FAA contributes to multiple national and international 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.

Participation in international aviation standards-setting committees is one of the key activities through which the FAA provides significant leadership on the topic of runway safety-related issues. Entities such as the Radio Technical Commission for Aeronautics Inc. (RTCA), a federal advisory committee to the FAA, manage 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 develops 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.

Runway safety issues are addressed within the context of the FAA's overall direct collaboration with regulators such as the European Aviation Safety Authority and Transport Canada. Organizations such as the International Air Transport Association, Airports Council International, International Federation of ALPA and the Flight Safety Foundation also promote and support runway safety from their individual stakeholders' perspective. The FAA maintains an engaged and collaborative relationship with these organizations as part of its overall international leadership efforts.

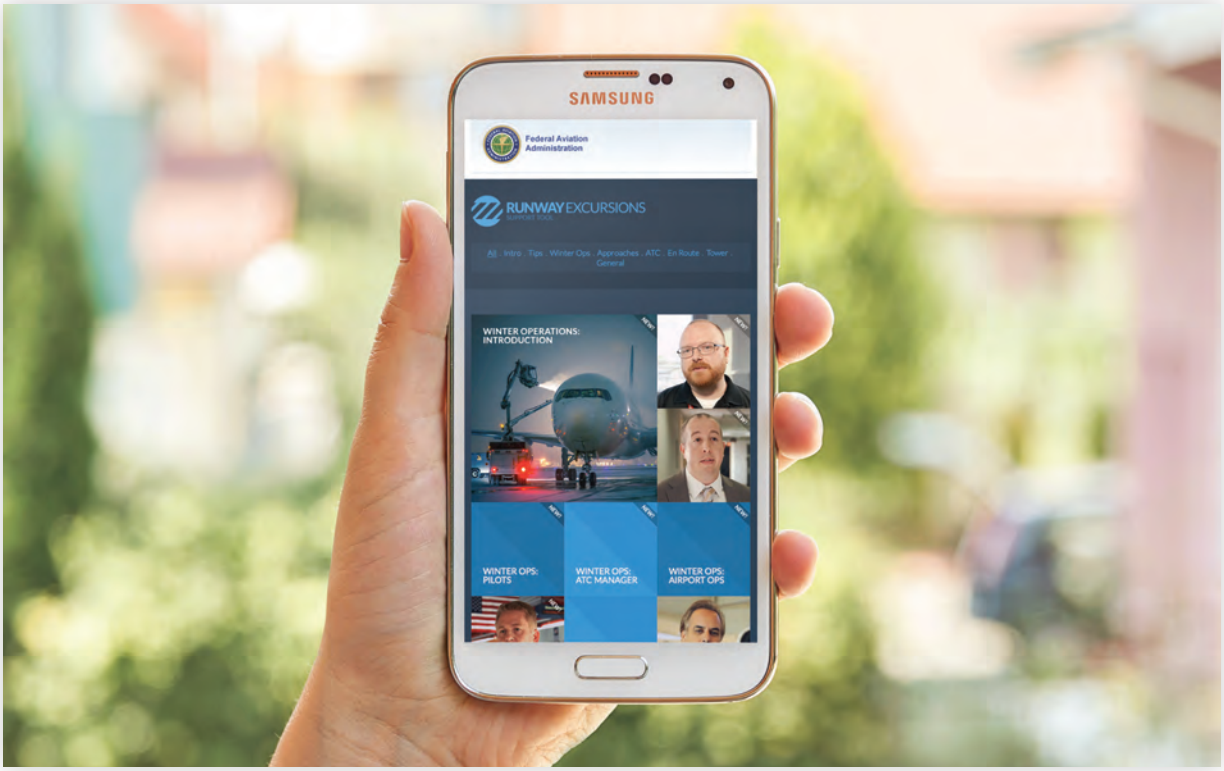
Additionally, the FAA supported the United Nations World Food Program, briefed the 7th Annual Global Humanitarian Aviation Safety Conference and met with international service providers to the program to provide best practices for surface operations, and guidance on how to conduct runway safety teams, as well as providing real world examples of surface hazards.

2.9.1 ICAO Panels

The FAA participated in numerous ICAO panels during FY2013 – FY2014:

- *Member of the ICAO Runway Safety Partnership Program — The FAA and Programme Partners supported the ICAO Regional Runway Safety Seminars (RRSS), raising awareness and providing exposure to developing successful Runway Safety Teams; the RRSS effort concluded in 2014; The FAA also supported the ICAO/International Air Transportation Association (IATA) Key Performance Indicator Working Group, which is developing global metrics, data sources, and analytical goals in order to standardize data and facilitate global analytics; the group has agreed on standardized definitions and is integrating data*
- *Supported ICAO RRSS in Dubai, Antigua and Turkey*
- *Supported the development and execution of ICAO Runway Safety Go Team, the Runway Safety Team Handbook, and the Runway Safety iKit; the Runway Safety Go Team methodology promotes the establishment of Runway Safety Teams at airports as an effective means to reduce runway related accidents and serious incidents*
- *Developed training agreements and seminars to help international airports comply with ICAO certification and SMS requirements*
- *Supported the Office of the Secretary of Transportation Safe Skies for Africa Office by co-leading a runway safety workshop in Johannesburg; this workshop provided detailed education on runway safety methods, tools and safety culture to regulators, policy makers, airport operators and airline operators*
- *Supported ICAO Regional Action Safety Groups runway safety initiatives globally through workgroup participation in the Latin America Region and conferences in the Middle East and Asia Pacific Regions*

Figure 5.
RE Support Tool



- *Member of the ICAO/IATA Key Performance Indicators Working Group, which is working to standardize metrics and establish analytical methods internationally; this working group is developing global metrics, data sources and analytical goals in order to standardize data and facilitate global analytics; the group has agreed on standardized definitions and is integrating data*

2.9.2 CAST/ICAO Common Taxonomy Team

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 converse effectively on common safety issues.

2.9.3 Civil Air Navigation Services Organization

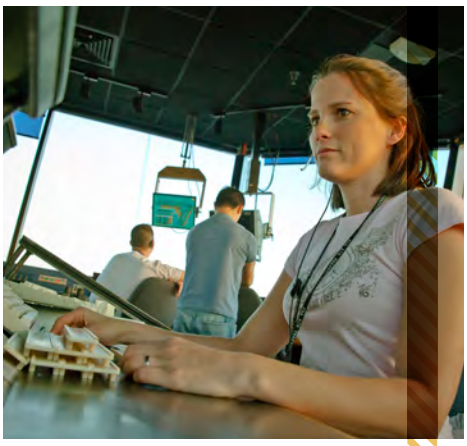
The Civil Air Navigation Services Organization (CANSO) is the global voice of ATM worldwide. CANSO members support over 85 percent of world air traffic. Members share information and develop new policies, with the ultimate aim of improving air navigation services on the ground and in the air.

The Safety Standing Committee (SSC) oversees CANSO's safety program and aims to continually improve safety performance in ATM operations, further enhance safety management and culture among CANSO members, and provide global leadership on safety management issues. CANSO's safety program helps service providers improve safety through elements such as SMSs, best practices, and benchmarking. The FAA lends resources to the SSC and serves as program manager.

During FY2013 – FY2014, the FAA promoted runway safety and safety management at meetings in the following cities:

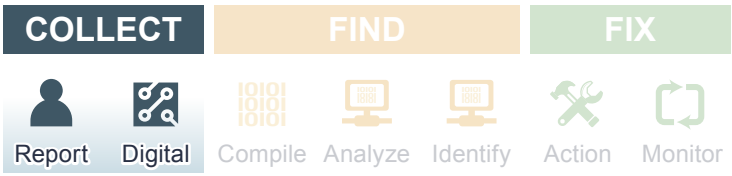
- *Amman, Jordan: CANSO Middle East Regional Safety Seminar and Colombo, Sri Lanka: CANSO Regional Safety Seminar — Focused on the benefits of runway safety teams and the utilization of a new runway safety maturity survey which provides another tool for runway safety teams to not only identify areas of weakness but to help define their next steps toward maturing their runway safety program*
- *Kampala, Uganda: CANSO Africa Safety Seminar — Focused on SRM; the seminar walked participants through the application of the SRM process on an identified high-risk runway hazard and the development of a safety analysis and monitoring plan for mitigating the hazard*
- *Muscat, Oman: ICAO Middle East Regional Action Safety Group — The FAA/CANSO participated in a session at the conference addressing REs; during this session, FAA/CANSO shared methods on how ATCs can help prevent REs; additionally, the FAA shared promotional material on avoiding REs; the material focused on both ATC and pilot perspectives*

In March 2014, the FAA partnered with CANSO and NATCA to release the REs Support Tool, a web tool featuring comprehensive references and videos for pilots and air traffic controllers. The available materials constitute a collection of best practices and describe ways to contribute to safe operations and reduce REs.



3.0 Collect

The runway safety governance groups described in Section 2.0 use the FAA's SMS as a tool to help **COLLECT** information or data, **FIND** problems, and **FIX** them. Specifically, **COLLECT** refers to having a system in which we collect data from various sources. This section focuses on the data collected in 2013 and 2014.



Constantly reducing the likelihood of airplanes colliding with obstructions on and near airport runways — whether they are other aircraft, vehicles, individuals, or wildlife — is the primary objective of the FAA runway safety initiative. Go to http://www.faa.gov/airports/runway_safety/ to see how the FAA examines and analyzes causal factors that contribute to risk and directs resources and develops safety programs accordingly.

National efforts to promote runway safety focus on two types of safety events to understand safety trends and to improve safety performance: RIs and REs. Both types of events can lead to incidents, accidents, and serious air traffic service disruptions.

The FAA uses SRM under *FAA Order 8040.4A (4/30/12)* to identify, quantify and mitigate the most significant risk factors for safety events in order to reach safety goals. By reducing the likelihood of contributing causal factors, we can continue to reduce the likelihood of dangerous events and system disruptions. With more comprehensive data, the FAA made substantive progress in identifying the factors that contribute to serious risk. These factors will help FAA address serious runway safety events.

3.1 Runway Incursions (RIs)

3.1.1 What is an RI?

According to the ICAO definition that FAA adopted in 2007, an RI is 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. By adopting this new definition the FAA reclassified certain events that would have been determined to be "surface incidents" as RIs. One result of this reclassification was an increase in reported RIs (Figure 1).

3.1.2 RI Classifications

RIs are classified by type, typically falling into one of three categories: Operational Incidents (OIs), Pilot Deviations (PDs), or Vehicle/Pedestrian Deviations (V/PDs). These classifications allow mitigation strategies to be developed by the appropriate FAA organization. Figure 6 below lists the types of surface events.

Figure 6.
Types of Surface Events

Operational Incident

A surface event attributed to ATC action or inaction.

Pilot Deviation

Action of a pilot that violates any federal aviation regulation. *Example: A pilot crosses a runway without a clearance while en route to an airport gate.*

Vehicle/Pedestrian Deviations

Any entry or movement on the movement area or safety area by a vehicle (including aircraft operated by a non-pilot or an aircraft being towed) or pedestrian that has not been authorized by ATC.

RIs are further classified by severity as shown by Figure 7. RIs categorized as A or B requires agency and industry resources to analyze and identify causal and contributory factors surrounding the event. Runway safety results are then compiled within the Runway Incursion Statistical Database and posted on the FAA Aviation Safety Information Analysis and Sharing (ASIAS) website.

Figure 7.
RI Severity Rating

A A serious incident in which a collision was ***narrowly avoided.***

B An incident in which separation decreased and there is a ***significant potential for collision,*** which may result in a time critical corrective/evasive response to avoid a collision.

C An incident characterized by ***ample time and/or distance*** to avoid a collision.

D Incident that ***meets the definition of RI,*** such as incorrect presence of a single vehicle/person/aircraft on the protected area of a surface designated for the landing and takeoff of aircraft but with no immediate safety consequences.

3.1.3 Data Trends

In FY2013, towered airports reported a total of 1,241 RIs, which is an increase of 91 RIs from FY2012. In FY2014, these airports reported a total of 1,264 RIs, an increase of 23 RIs from FY2013. The increase correlates to improvements in reporting systems and several years of safety culture enhancements that encourage employee reporting.

Notwithstanding new reporting procedures, the total number of RIs by commercial operations has remained steady over the past four years. The number of serious RIs classified as A or B remains below our safety metric of fewer than 0.395 events per million operations for FY2013 and FY2014 (Figure 8).

Currently, runway safety is measured by monitoring three metrics:

- *Frequency or rate of serious RIs*
- *Severity of RIs*
- *Types of RIs*

Figures 9 to 12 provide details on the counts and trends using these metrics. Appendix C is a historical listing of RIs by airport.

Classification by type and severity requires agency and industry resources to analyze and identify causal and contributory factors surrounding RIs categorized as A or B. Runway safety results are then compiled within the Runway Incursion Statistical Database and posted on the FAA ASIAS website.

ACCOMPLISHMENT

At the end of FY2014, the rate for serious runway incursions was .283 events per million operations (Figure 8)

Air traffic control towers report events as Mandatory Occurrence Reports (MORs). They use procedures to enter the information in the CEDAR system or manually, if necessary. Once the MOR is reported, the service area runway safety team manager manages the process of determining whether the events are RIs, REs or surface incidents, and supports entry of the incursion data into the national database.

Figure 8.
Rate of Serious Category A & B Runway Incursions

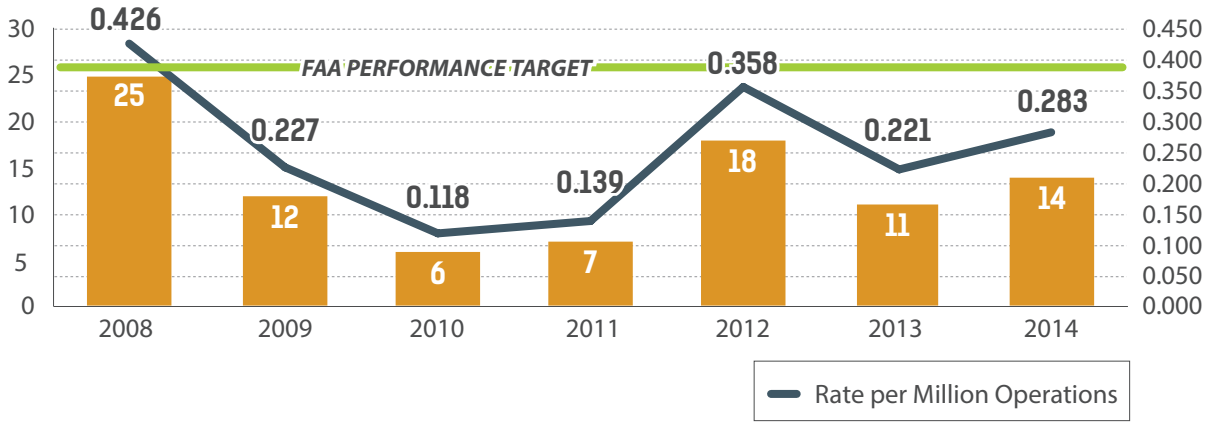


Figure 9.
Runway Incursions FY2013 and FY2014

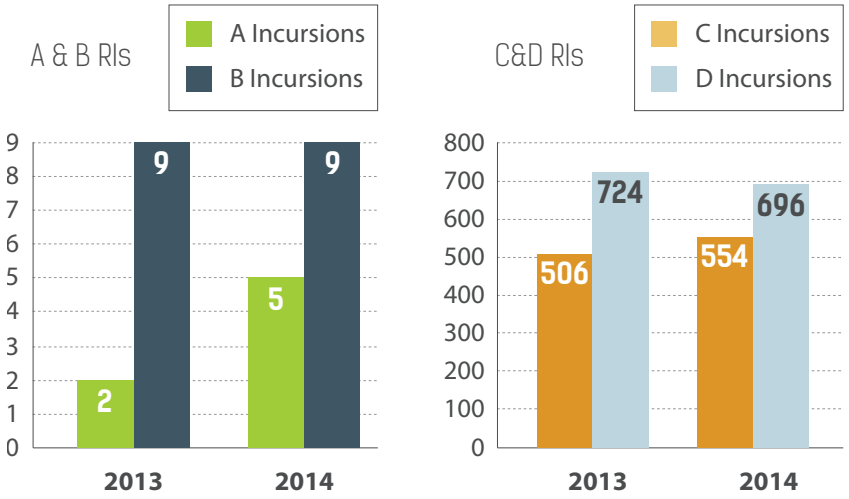


Figure 10.
2013 Runway Incursions Totals by Type

	Operational Incidents	Pilot Deviations	Vehicle/ Pedestrian Deviations	Other**	Total	**Annual RI Rate***
AAL (Alaskan)	13	16	12	1	42	**51**
ACE (Central)	3	31	3	0	37	**24**
AEA (Eastern)	25	68	21	0	114	**19**
AGL (Great Lakes)	47	88	36	1	172	**27**
ANE (New England)	7	30	7	0	44	**24**
ANM (Northwest Mountain)	28	68	25	0	121	**27**
ASO (Southern)	53	154	23	1	231	**21**
ASW (Southwest)	27	104	41	0	172	**27**
AWP (Western Pacific)	40	224	43	1	308	**28**
TOTALS	**243**	**783**	**211**	**4**	**1241**	**248**

* Annual RI Rate — Calculated for all RIs. RI events per million operations.

** Other — Events that meet the criteria of an RI though do not fit within the primary types (emergencies, equipment failures, etc.).

Figure 11.
2014 Runway Incursions Totals by Type

	Operational Incidents	Pilot Deviations	Vehicle/ Pedestrian Deviations	Other**	Total	**Annual RI Rate***
AAL (Alaskan)	6	30	17	0	53	**66**
ACE (Central)	6	12	6	0	24	**16**
AEA (Eastern)	67	59	31	1	158	**26**
AGL (Great Lakes)	37	77	23	2	139	**22**
ANE (New England)	6	11	5	0	22	**12**
ANM (Northwest Mountain)	21	68	21	0	110	**24**
ASO (Southern)	41	147	31	3	222	**20**
ASW (Southwest)	25	116	43	1	185	**29**
AWP (Western Pacific)	49	244	57	1	351	**31**
TOTALS	**258**	**764**	**234**	**8**	**1264**	**246**

* Annual RI Rate — Calculated for all RIs. RI events per million operations.

** Other — Events that meet the criteria of an RI though do not fit within the primary types (emergencies, equipment failures, etc.).

Figure 12.
2013 and 2014 Runway Incursions Totals by Severity

		Severity				Total RIs	**Annual RI Rate***
		A	B	C	D		
AAL (Alaskan)	2013	1	0	16	25	42	**1.245**
	2014	0	0	20	33	53	**0.000**
ACE (Central)	2013	0	0	10	27	37	**0.000**
	2014	0	1	11	12	24	**0.659**
AEA (Eastern)	2013	0	3	51	60	114	**0.492**
	2014	0	1	81	76	158	**0.164**
AGL (Great Lakes)	2013	0	0	74	98	172	**0.000**
	2014	1	5	66	67	139	**0.935**
ANE (New England)	2013	0	0	19	25	44	**0.000**
	2014	0	0	10	12	22	**0.000**
ANM (Northwest Mountain)	2013	0	0	46	75	121	**0.000**
	2014	1	1	44	64	110	**0.441**
ASO (Southern)	2013	0	1	104	126	231	**0.090**
	2014	1	0	92	129	222	**0.090**
ASW (Southwest)	2013	0	1	55	116	172	**0.156**
	2014	0	0	77	108	185	**0.000**
AWP (Western Pacific)	2013	1	4	131	172	308	**0.460**
	2014	2	1	153	195	351	**0.276**

* Calculated for serious (A & B) RIs only. RI events per million operations.

3.2 Runway Excursions (REs)

In FY2012, the RSG adopted the ICAO definition of RE as "a veer-off or overrun off the runway surface." According to ICAO, the number of significant REs has not decreased in over 20 years. Over 30 percent of reported U.S. REs are accidents. For this reason, the FAA is expanding the scope of runway safety to include REs.

Like airborne and RI events, the FAA is focused on identifying the features that create undue risk of an RE using a data-driven approach. With the addition of REs to the scope of runway safety, the FAA continues to establish methodology to effectively collect, categorize, and assess relevant data. The FAA participates with multiple regulatory agencies and industry groups to develop action plans to reduce REs, including the ability to merge appropriate data within various FAA organizations. In January 2014, the RSG briefed the National Transportation Safety Board (NTSB) Vice Chairman in regards to various FAA efforts to reduce REs. The RSG and the NTSB agreed to continue to collaborate with one another to mitigate the risk of excursion.

3.3 RE Classifications

In FY2014, the RSG completed initial deployment of the Runway Excursion Database that fuses ASIAS and CEDAR data. The primary role of the initial development of the Runway Excursion Database includes:

- *Determining the frequency and scope of RE events*
- *Defining a basic severity classification and hazard identification processes*
- *Providing high-level charts and statistics to easily interpret the information*
- *Facilitating data-sharing and analysis across FAA organizations*

An aircraft accident is defined as an event resulting in a fatality, serious injury, hull loss or substantial damage. For these purposes, an aircraft incident is defined as minor injury or minor damage, and an occurrence is defined as an event that is not an aircraft accident or incident.

ACCOMPLISHMENTS

Initial deployment of the Runway Excursion Database

Definition of runway excursion classifications

3.4 RE Data

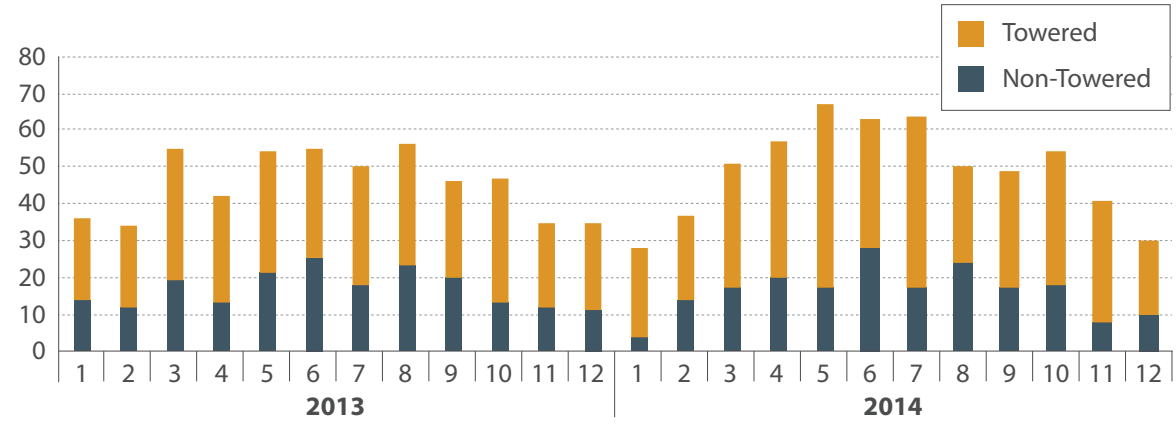
Data for REs is currently available by calendar year and not fiscal year. In CY2013, there were over 530 U.S reported/collected REs at towered and non-towered airports. In CY2014, there were over 550. The RSG continues to refine RE data collection efforts.

3.5 Other Events

In addition to RIs and REs, FAA also monitors other surface safety events and develops appropriate control measures:

- *Taxiway excursion*
- *Abnormal surface contact*
- *Collision during taxi*
- *Helicopter event*
- *Ramp event*
- *Taxiway events*

Figure 13.
Runway Excursion Data for CY2013 and CY2014*: Monthly Total



* RE data for December 2014 is partial due to the timing of this report.

Figure 14.
CY2013 and CY2014 Reported Runway Excursions by Region

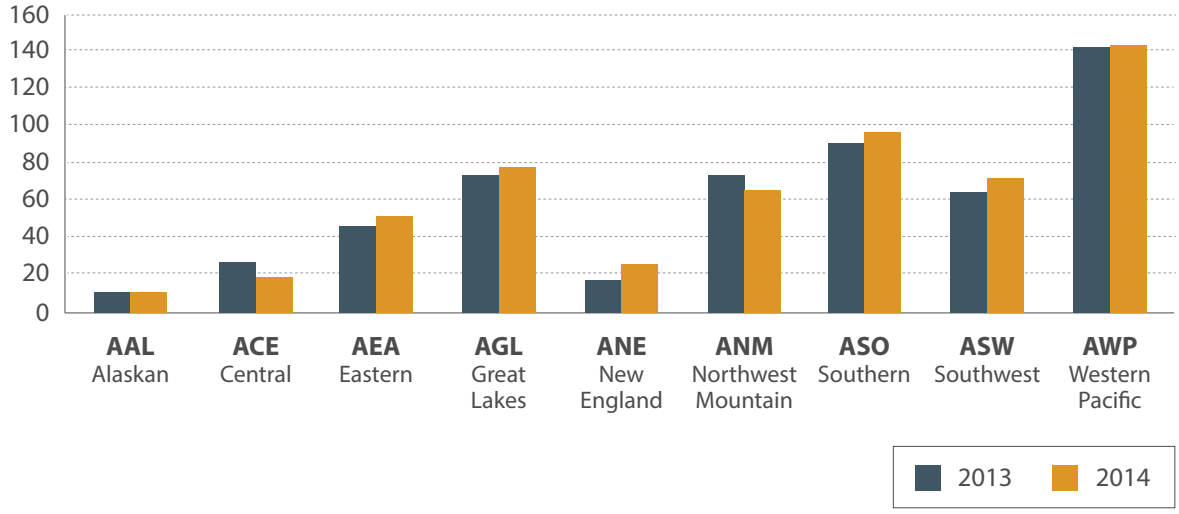


Figure 15.
Runway Excursion Type for Towered and Non-Towered Airports (CY2013/2014 Combined)

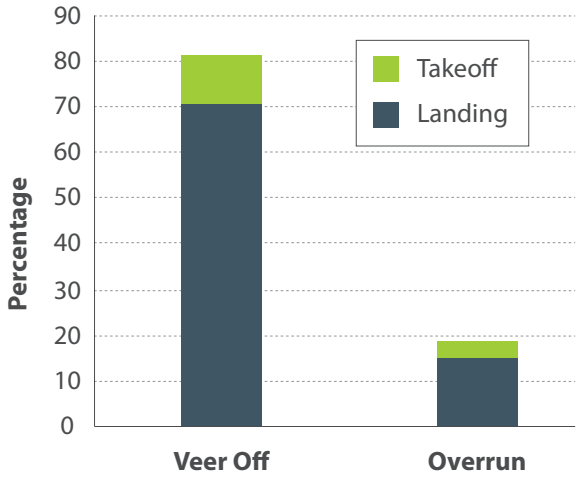
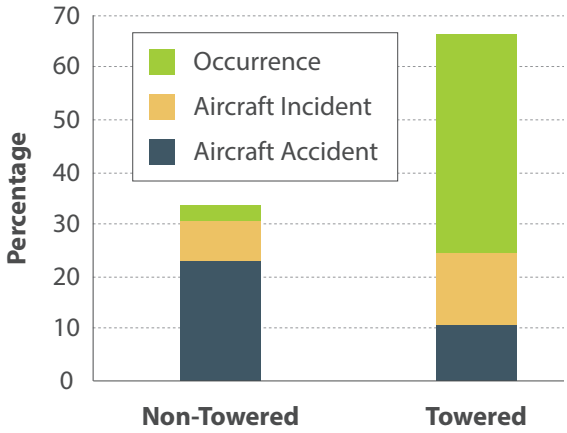
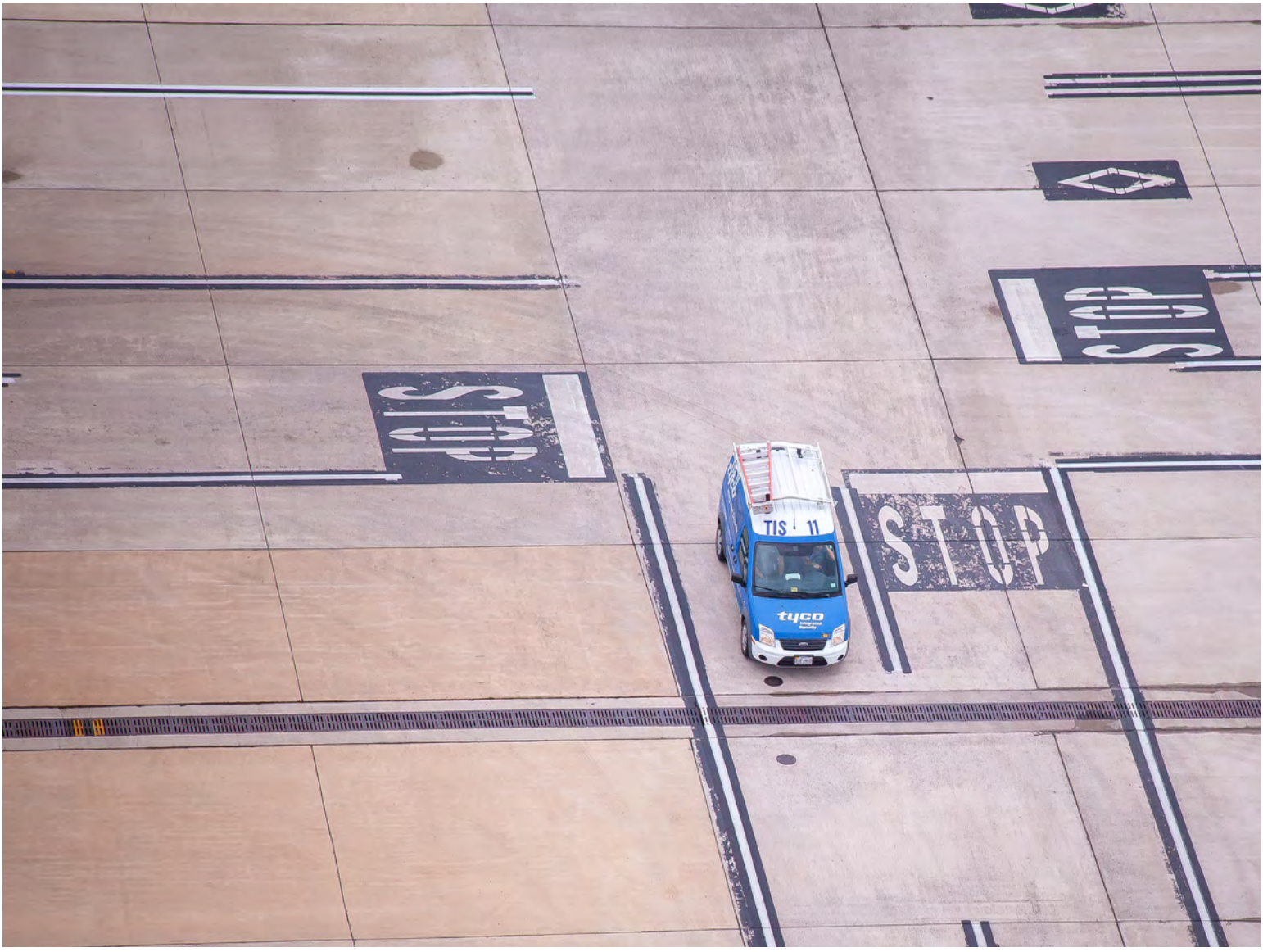
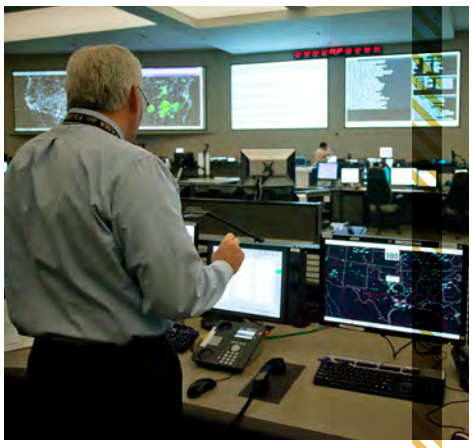


Figure 16.
Towered vs. Non-Towered Airports (CY2013/2014 Combined)







4.0 Find

The ***FIND*** aspect of the ***COLLECT-FIND-FIX*** model refers to finding problems in the collected data. The FAA compiles and analyzes data, and then identifies areas to improve.

Our safety initiatives follow the FAA SRM process under *FAA Order 8040.4A*. Safety and operational data is analyzed to identify and assess risks. As risks are assessed, mitigation measures are developed and implemented. Each hazard and mitigation measure helps understand and avoid or mitigate a particular safety event. For example, an RI that has confusing airfield marking as a contributing factor can be mitigated with improved surface marking. Other mitigation measures address the consequences of a safety event by minimizing the negative outcome. For example, improvements to an RSA can reduce the severity of an RE event after the excursion occurs. Therefore, safety initiatives provide a means of understanding, preventing, or minimizing the outcomes of a safety event in the following ways:

- *Hazard identification and risk analysis: These initiatives identify current and emerging risks based on data, systems analysis and expert opinion. They identify causal factors and judge how they contribute to a negative safety event such as an RI. Runway Safety Action Teams (RSATs) analyze airport-specific hazards based primarily on expert opinion.*
- *Controls: These are mitigation measures that act as barriers that can prevent the occurrence of a safety event. Training and operational procedures are effective control measures that act as barriers.*
- *Recoveries: These are mitigation measures that reduce the severity of a safety event outcome after the fact. Airport Surface Detection Equipment (ASDE-X) alarms can alert controllers that an RI is underway in*

enough time to avoid a collision. ARFF equipment and procedures are also mitigation measures that can minimize negative outcomes.

4.1 Risk Assessment Initiatives

Risk assessment uses the SMS SRM process to identify real and potential hazards, and then analyzes associated risks to the aviation system. These initiatives are moving the FAA towards a risk-based, data-driven decision process. Reliable, accurate and consistent data is the key to hazard identification and risk analysis. It complements the opinion of subject matter experts and provides objective analysis to identify and justify and control measures for managing risks.

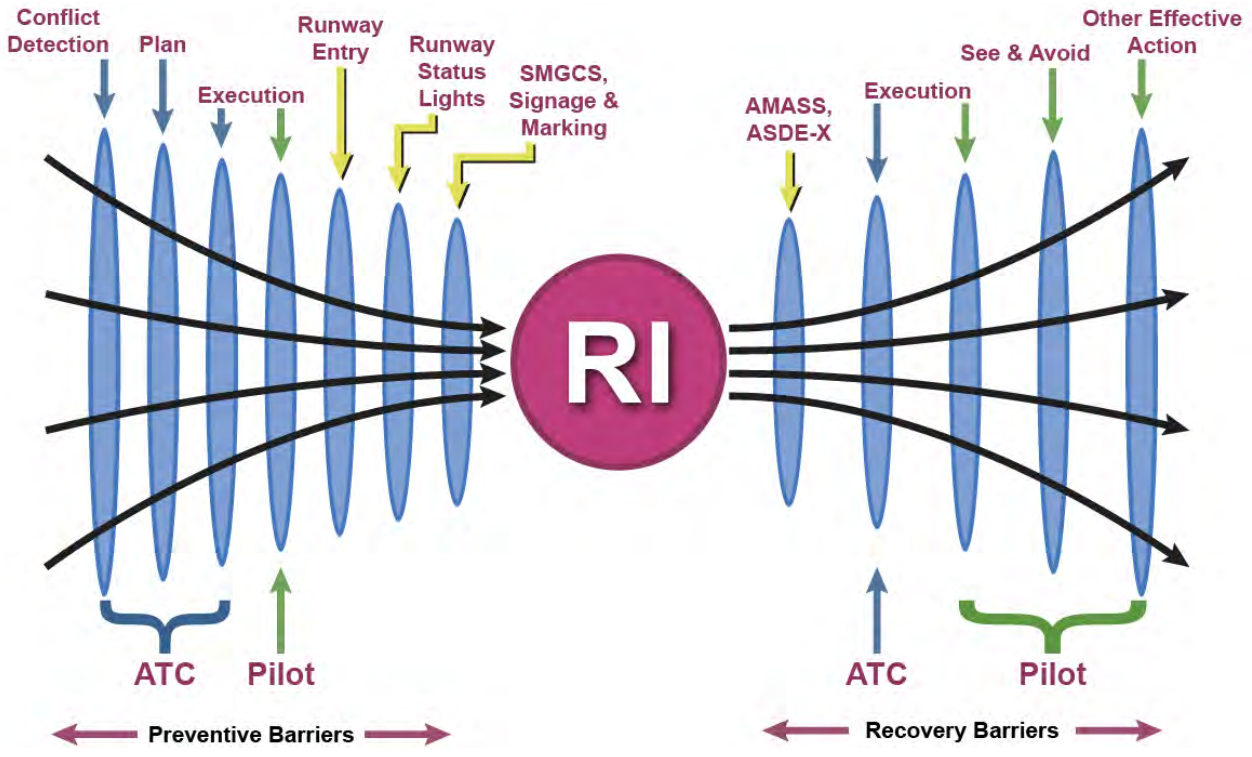
The FAA collects safety and operational data through electronic systems and reporting programs as a primary step of hazard identification. Airports in the U.S. with air traffic control services are required to report any incident that occurs on the surface of a runway environment, RSA, or on any other airport movement area. New automated recording and reporting systems are making those records more easily reportable and available. Voluntary safety reporting programs for pilots, air traffic controllers and employees of the Office of Airports are providing insight into causes of incidents. The FAA reviews all of these incidents and data sources through several initiatives to identify hazards, evaluate risks and develop control measures.

The following activities work in concert to identify hazards and risks within the context of current and evolving risk-based programs designed to improve safety on the airport surface.

4.2 Surface Risk Analysis Process (S-RAP)

The FAA is using a new tool for risk assessment called the S-RAP. The risk assessment process includes all surface losses of separation, not just RIs, as the S-RAP can analyze surface incidents that would not have been previously analyzed under the former risk assessment method. Similar to the current aviation event-based risk analysis process (RAP), the S-RAP identifies the causal and contributory factors of surface events involving conflicts and the relationships between actions and consequences. With the development and validation testing of the S-RAP tool complete, the tool is currently in use for all qualifying events. The FAA expects to establish a baseline by the end of FY2015, which will allow the FAA to analyze two full years of data.

Figure 17.
Risk Assessment: Prevention – Recovery



The S-RAP uses a mathematically derived matrix that considers several disparate elements including proximity, closure rates, weather conditions and pilot and air traffic controller barriers to produce severity ratings. Similarly, to arrive at repeatability (likelihood) ratings, the S-RAP considers systemic issues, non-systemic issues and window of opportunity. A number of modifications have been made on the previous tool in deriving severity and likelihood of a Risk Analysis Event (RAE) by the latest S-RAP. The enhancements are identified below:

- *The severity score for the "proximity" element is determined by analyzing the probability distribution of historical "proximity" data, hence removing subjectivity*
- *The severity score for the "closure rate" element is determined by analyzing the probability distribution of historical 'closure rate" data, hence removing subjectivity*
- *The Explicit Barrier function method was used to derive the "controllability" element of severity, considering the breakdown of ATC barriers, pilot barriers and NAS barriers separately; the controllability barriers were made flexible, thereby accommodating different sets of barriers, as will be present in a particular airport/runway for any specific surface incident*
- *The effect of technological barriers used in RI prevention, such as RWSL, Runway Guard Light (RGL), Airport Movement Area Safety System (AMASS) and ASDE-X, are captured in the latest S-RAP*
- *Airport signage/markings and FAR Part-139 compliance have been considered while controllability scoring*
- *The effects of airport geometry play a crucial role in RI repeatability and are introduced in the latest S-RAP*
- *The effects of airport construction and runway closure on repeatability are also considered*

The S-RAP identifies the causal and contributory factors of surface events involving conflicts and the relationships between actions and consequences. The S-RAP also allows for the development of CARs and plans utilizing information from stakeholders.

The RSG, in conjunction with other stakeholders, is reviewing the results of the S-RAP demonstration and developing a surface safety performance metric action plan.

The data collected by the S-RAP during the demonstration phase is central to establishing the System Risk Event Rate as the new surface safety performance metric. Establishing a surface safety System Risk Event Rate will allow the FAA to accomplish the following:

- *Initiate this approach to improving safety with international partners*
- *Integrate controller and pilot performance data on all air traffic incidents*
- *Evaluate separate incidents caused by other factors, including PDs*
- *Avoid under-reporting and misclassification of incidents*

4.3 Runway Incursion Assessment Team (RIAT)

The RIAT is composed of one representative from the Office of Airports, Flight Standards Service and ATO Terminal Services, and meets weekly to assess the severity of each RI event. Event data is extracted from the runway safety database on a weekly basis. The RIAT members review each event and the relevant details. Data such as surface surveillance replays, controller/pilot/driver statements, airport diagrams, airport geometry, separation, weather and time of day are discussed, when available. The team then rates each event according to the severity category guidelines contained in *FAA Order 7050.1B (11/07/13),* resulting in an A, B, C,or D rating. Each RIAT member votes on event severity and, if a consensus is reached, the final severity rating is recorded in the Runway Safety Database.

4.4 Runway Safety Action Team (RSAT) Programs

Longstanding runway safety programs dedicated to hazard identification and analysis continue to focus attention and resources towards airports with unique and potentially hazardous operating conditions in an ongoing effort to reduce risk. These programs work in conjunction with several of the new initiatives to augment SRM efforts and enhance the knowledge base. *FAA Order 7050.1B* provides improved guidance and organizational structure for performing RSAT meetings and for reviewing and approving Runway Safety Action Plans (RSAPs).

ACCOMPLISHMENT

Issued FAA Order 7050.1B to improve guidance and organizational structure

4.4.1 RSAT

Chartered by *FAA Order 7050.1B,* RSATs convene annually to discuss surface movement issues and concerns at all FAA and federal contract towered airports and then formulate

RSAPs to address the issues raised at those airports. The team includes personnel from the local ATCT, airport management, tenants, other FAA lines of business and any interested users of the airport. There are three types of RSATs: local (LRSAT), led by the ATCT manager; regional, led by the Regional Runway Safety Program Manager; and special focus (SFRSAT), led by the RSG.

In FY2013 and FY2014, there were a total of 1,039 RSAT meetings, resulting in 651 action items. One of these meetings was a SFRSAT, while 21 meetings were regional-level events, and the remaining meetings were led by local air traffic managers. RSATs have resulted in the collaborative identification and mitigation of safety issues at all FAA and Federal Contract towered airports.

Three notable 2013-2014 RSATs are listed below:

- *The Western Pacific Regional Runway Safety Office accomplished 24 outreach events which enabled communication with 2,149 stakeholders; the team directly supported 18 RSATs including five RRSATs*
- *On September 4, 2014, a focused RSAT meeting was held at Shreveport Downtown (DTN) to address seven V/PDs that occurred in a three month span; representatives in attendance included RS, FSDO, the Office of Airports, local ATC, Shreveport Airport Authority and Louisiana State Aviation Department*
- *A SFRSAT was convened at David Wayne Hooks Airport (DWH) in Houston in FY2014*

ACCOMPLISHMENT

Expanded toolkit to include REs

4.4.2 Regional and Special Focus RSAT

Regional and special focus RSAT meeting attendees include airport managers, airport operations and maintenance personnel, ATCs, Technical Operations personnel, airport tenants, airline and charter company personnel, fixed-base operators, corporate flight department personnel, members of military units, GA pilots, airport certification inspectors, aviation safety inspectors, ARFF personnel, local law enforcement, military and other stakeholders who operate on the airfield. RRSATs and SFRSATs may be utilized to organize all pertinent lines of business in addressing high priority targets based on risk-based decision-making.

4.4.3 Local RSAT

LRSAT meetings support the FAA Runway Safety Program under *FAA Order 7050.1B*. They operate similar to RSAT meetings except that the local ATCT manager leads the meetings instead of the region's Runway Safety Program Manager. LRSAT meetings are organized and conducted by air traffic facilities and supported by runway safety regional offices. RSATs, whether special focus, regional or local, have proven successful for:

- *Reducing RIs*
- *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*

4.4.4 Local RSAT Toolkit

The LRSAT toolkit, downloadable from the Runway Safety web page, was created in FY2011 and provides supplemental guidance to air traffic managers on how to plan and conduct effective RSAT meetings, as well as how to develop and update their RSAP. The toolkit also provides directives, contacts, templates, examples and other resources to facilitate more productive and effective meetings. In the beginning of FY2014, REs were added to the toolkit to help facilitate discussion among pilots, air traffic controllers and the airport authority. The toolkit can be downloaded from the FAA website at: http://www.faa.gov/airports/runway_safety/resources/lrsat/. It is also available to all FAA air traffic managers through the FAA Knowledge Services Network site. This site was accessed 2,414 times from FY2013 to FY2014.

4.5 ATO Quality Programs

In 2012, new safety orders governing ATO Quality Control and Quality Assurance Programs (QAPs) established processes by which FAA collects, analyses and monitors operational data for improving system operations and safety. *FAA Order 7210.633 (01/30/12), ATO QAP* ensures that all policies and procedures are followed correctly and, when not, whether mitigations and plans/efforts put in place are effective. *FAA Order 7210.634 (01/30/12), ATO Quality Control* assesses the output (whether a product or service) of a particular process

or function and identifies any deficiencies or problems to address. Together, these orders identify safety trends and ensure that all policies and procedures are followed regardless of source, and that appropriate corrective actions have been developed and implemented. The Quality Assurance/Quality Control (QA/QC) programs implement the ATO ***COLLECT–FIND–FIX*** strategy for a proactive approach that focuses on reducing safety risk.

4.6 Air Traffic Common Taxonomy Version 3

Risk-based safety depends upon the development of a common data language. Integration or fusing of data from sources across multiple lines of business and multiple data repositories is a primary requirement for the development of cross-agency standards, risk state definitions and modeling integrity. Common data taxonomies will promote data standardization to ensure consistent sharing of safety data across the FAA and with industry constituents and international peers. The Air Traffic Common Taxonomy Version 3 (ACT v3) provides two overarching benefits with respect to the analysis of safety data. First, it establishes a common safety language that links runway safety event data, surface hazards identified through the ATO SRM process and ATO requirements in a seamless framework. Second, ACT v3 exhaustively classifies all components of a hazard, such as who was involved in the event (e.g., agents), what was involved (e.g., equipment or infrastructure types), when the event occurred (phase) and why (causal and contributing factors). As a result, the new taxonomy will facilitate more detailed analyses to identify and quantify how different conditions contribute to system risk and will support the development of the S-RAP (Section 4.2).

4.7 The ATO Top 5

The ATO Top 5 is a quantifiable list of hazards that contribute to the highest risk in the NAS. It is the culmination of the ATO's proactive safety management activities—valuing input from the frontline employees, deploying technology to gather data, improving analysis to identify risk and embracing correction to mitigate risk.

The Top 5 sets annual priorities that enable the ATO to focus on the most pressing areas of risk. That is what the SMS is all about: finding hazards/issues and addressing them to improve safety. The ATO continues to demonstrate the success of the Top 5 by monitoring the corrective actions made to previous Top 5 lists for two years. During this critical part of the SMS feedback loop, the ATO ensures corrections properly mitigate risks and address activities that do not.

In the past, the Top 5 were selected by studying the rate of high-risk events identified through the airborne RAP only. For the first time, the FY2014 hazard data included S-RAP and was augmented with ATSAP trends, Operational Skills Assessments (OSA), System Service Reviews (SSR), runway safety reports and accident investigations from the NTSB and Safety and Technical Training Compliance Services Group. The inclusion of this data resulted in the first Top 5 issue related to surface incidents and runway safety. For F20Y15, Surface Memory Aids is a Top 5 issue that focuses on improving runway safety through the use of memory aid tools in air traffic control towers.

ACCOMPLISHMENTS

Surface RAP data added to the analysis for the Top 5 List

Surface Memory Aids included as one of the Top 5 safety issues for FY2015

4.8 Runway Incursion Mitigation (RIM) Program

The Office of Airports' RIM Program is a data-driven, risk-based, proactive program that will develop solutions at runway/taxiway intersections to help prevent runway incursions from occurring. An Office of Airports and FAA Technical Center data mining effort collected data from 2007 to 2013 on nationwide RIs at all towered airports. The data was collected from multiple sources including NTSB, NASA and the FAA Runway Safety RI Database.

A thorough review of the safety data identified airfield geometry as a primary contributing cause of RIs. Each RI was assigned by geometry type(s) in a Geographic Information System (GIS).

New Office of Airports' design standards in 2007 eliminated many of the confusing geometries for new construction; however, a large number of these confusing runway/taxiway intersections still exist at airports today.

The Office of Airports is developing a new comprehensive and multi-year program to correct these confusing taxiway locations to reduce the likelihood of RIs. A risk-based approach in

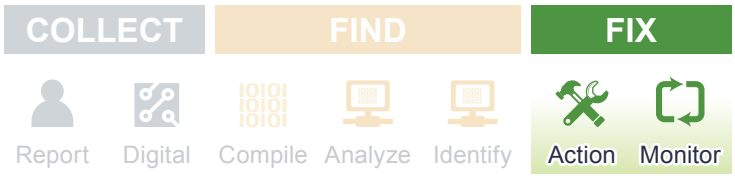
prioritizing RI locations (including wrong runway arrival/departure) identified potential improvement locations. Moving forward, these potential locations will be updated as improvements are made and/or additional data is collected.

ACCOMPLISHMENT

Established the RIM Program

5.0 Fix

FIX refers to making a plan of action and taking the necessary action to improve the area. Subsections of this chapter describe fixes deployed by the FAA in 2013 and 2014.



Numerous FAA-wide runway safety activities and programs were initiated in the FY2013 – FY2014 timeframe, including the development of a risk-based Runway Safety Focus Airport program. Building on a decade of success in reducing runway risk, the FAA is developing integrated data-driven approaches that are helping achieve the FAA's priority initiative of "Making Aviation Safer and Smarter.[2]"

5.1 Converging Runway Operations

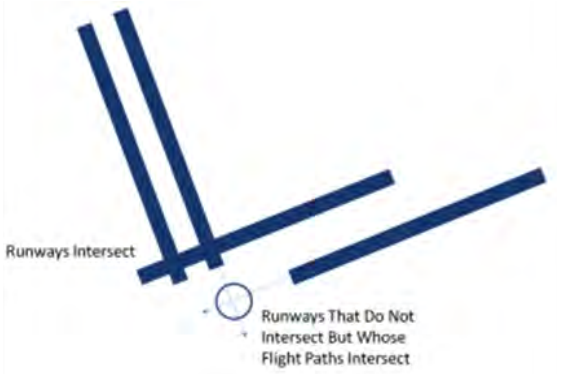
In September 2013, the FAA announced a new policy to address safety concerns that limited the use of non-intersecting converging runways whose flight paths intersected within one nautical mile. This is one of the most substantial safety improvements to the NAS in the last ten years.

During an investigation of go-around or aborted landing of aircraft events reported between 2011 and 2013, the ATO's Safety and Technical Training identified a systemic problem in the NAS. The investigation included a review of close proximity events that did not provide separation of, or protection from, unanticipated go-arounds on non-intersecting runways at Chicago O'Hare (ORD) and George Bush Intercontinental

[2] FAA Strategic Initiatives, 2014 – 2018

(IAH). In the event of a rejected landing, the aircraft may unexpectedly be in the proximity of another aircraft departing from a non-intersecting converging runway, potentially compromising established safety margins. The result of CROs created an airborne risk of collision (Figure 18).

Figure 18.
Non-Intersecting Converging Runway Conflicts



This hazard, known as Go-Around/Rejected Landings, was identified as a leading indicator of risk during independent operations on non-intersecting runways and was elevated to the ATO Top 5 safety hazards list.

At the same time, the NTSB released a safety recommendation to the FAA urging the agency to take action on CROs. Beginning in August 2013, the FAA convened a joint FAA-industry taskforce to draft an implementation plan for new safety requirements. The goal was to analyze the data, identify causal factors, inform key stakeholders and collaborate across industry to create a corrective action plan. The group recommended policy changes to FAA orders that limited the use of non-intersecting converging runways whose flight paths intersected within one nautical mile. They also recommended the development of a tool for air traffic controllers to assist in optimizing the efficiency of local operations while implementing the new change.

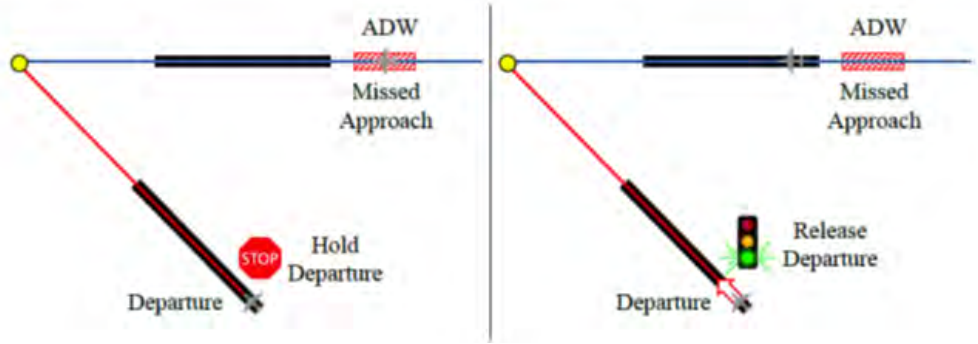
The new tool, known as the ADW tool, was a collaborative effort with MITRE, a federally funded research and development center, to identify possible solutions that would optimize the efficiencies of implementing the new CRO rule. The ADW tool creates a display on the controller's radar screen that provides a "go/no go" marker (Figure 19). Using innovative techniques that rely on mathematical models to create visual intersections, a controller can make safety decisions well before risk is present.

Through the development and analysis process, the taskforce realized a need to accommodate various runway configurations. Each ADW is unique and must be customized for each airport. Therefore, the taskforce recommended a phased approach for air traffic facilities to become compliant. This recommendation allowed for sufficient flexibility for each airport to implement the changes most conducive to their configuration while creating the greatest possible safety margin for their specific operation.

The analysis process identified 127 airports with runway combinations that meet CRO criteria, each with a different runway configuration. Under the guidance of the taskforce, ATO is using a phased implementation schedule that began

Figure 19.
Arrival Departure Window (ADW) Tool

Application of an ADW operation.



(Left) An arriving aircraft is within the ADW boundaries, so the departure aircraft is held.

(Right) No arriving aircraft is within the ADW, so the departure aircraft may be released.

in January 2014 with the high-risk facilities identified by the NTSB. Today, air traffic controllers are using the ADW tool at 13 high-priority airports as listed in Figure 20. The remaining airports are using more restrictive procedures that are based on runways that physically intersect. Additional ADW tools are also being developed and implemented as requested by these smaller airports.

Figure 20.
ADW Tool Locations

Airport	
BOS	JFK
BWI	LAS
CLT	MEM
DFW	MSP
HNL	ORD
IAD	PHL
IAH	

A post analysis of CRO and ADW implementation revealed several positive outcomes. In addition to working with industry, the ATO focused heavily on its relationship with facilities, management and air traffic controllers directly affected by the changes. Support to the field facilities addressed local implementation challenges. Taskforce members traveled to facilities and were instrumental in the field deployment of the ADW tool. Taskforce members facilitated site-specific briefings on the purpose, modeling, and implementation of CRO at each airport. The taskforce worked with managers and controllers at the airports to assure customers that their concerns were heard and reported to ATO executives. Discussions with controllers indicated that they preferred using the ADW tool because it eliminated the guess work that was required to ensure that an arrival that executed a go-around or aborted landing would not interact with an aircraft departing from a non-intersecting converging runway.

Since the implementation of the CRO policy and the ADW tool, no CRO-affected airports have experienced a high-risk, non-intersecting CRO.

ACCOMPLISHMENTS

Non-intersecting CRO policy issued and implemented

ADW tool implementation at 13 high-priority airports

ACTIVITY

Development of additional ADW tools, as requested

5.2 Training

Training is a fundamental component of the safety paradigm. During the SRM process, the FAA analyzes the likelihood of the occurrence and severity of NAS hazards, in accordance with FAA's current SMS SRM guidance, *FAA Order 8040.4A*. Procedure development and training are informed through this process. Procedures must be trained and, together, provide mitigation of some residual risks that could not be alleviated during system design.

5.2.1 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. Effective March 18, 2013, a revision to airport regulations (Part 139) states that all certificated airports now require recurrent driver training for non-airport employees, e.g., Fixed Base Operators (FBOs), personnel and technicians. An airport certification inspector must approve all training, and each airport must provide a syllabus in its Airport Certification Manual. Annual airport inspections are ensuring that all drivers with access to the airfield receive annual driver training. Today, 540 commercial airports certificated under Part 139 require annual training. Each regional runway safety office has available tools and presentations of current best practices to share with airports in support of driver training programs.

5.2.2 Air Traffic Controller Training

The ATO's Safety and Technical Training continues to include runway safety topics in the mandatory, semi-annual, recurrent training curricula for air traffic controllers.

- *August 16, 2013: Runway Incursion Prevention, with focus on tower scanning*
- *January 1, 2014: Runway Incursion Prevention, with a focus on situational awareness, drift and distractions; completed June 30, 2014*
- *July 1, 2014: Runway Incursion Prevention, with focus on hearback and readback error prevention, high energy runway crossings, managing landing operations and aircraft performance*
- *January 1, 2015: Recurrent training module designed to address the risks related to using runways as taxiways is under development*

Controller Vigilance Averts Possible Catastrophe

LAX Tower Controllers Take a Long View on Runway Safety

Some people always seem to be looking for trouble. But in the case of two controllers at Los Angeles International Airport control tower, that's a very good thing.

A view of Los Angeles International Airport from the tower cab.

The controllers, Dennis Julianna and Zoem Patel, averted a very dangerous situation on one of the airport's runways.

A Beechcraft Bonanza had landed on the most northerly runway and was trying to taxi to south of the most southerly runway. Controllers kept a close eye on him as he crossed one runway and was instructed to hold short of Runway 25R. The pilot read back the instruction correctly. Then, Zoem Patel, working local control, cleared an American Airlines Airbus 321 for takeoff on that same runway.

However, despite acknowledging the instruction to hold short of Runway 25R, the Bonanza pilot continued taxiing toward the runway at a rapid speed. "When they're going that fast, we suspect that they think they've been cleared to cross the runway," said Sherry Avery, the Los Angeles Tower Manager.

Dennis Julianna, working the local assist position, noticed the Bonanza's speed and notified Zoem, who reacted immediately by telling the Bonanza pilot twice to stop, and then cancelling the Airbus' takeoff clearance. The closest proximity between the two aircraft was estimated to be 8,400 feet.

Avery praised her controllers' quick responses. "Their vigilance was exemplary," she said, impressed that Julianna and Patel had been scanning almost two miles down the runway looking for potential hazards. "Professionals like these keep the system safe," she added.

Dennis Julianna (left) and Zoem Patel in the cab of the Los Angeles International Airport tower.

Even more impressive, said Avery, was that the controllers caught it before the ASDE-X alert system activated, "…which highlights the fact that the controllers caught it without an alarm."

A preliminary analysis shows that the Bonanza entered the safety area around the runway but did not enter the runway itself.

5.2.3 Pilot Training and Outreach

FAA's Flight Standards collaborates with key safety groups to reach as many pilots as possible with the runway safety message. This collaboration provides training material that addresses current runway safety issues. In FY2013, Flight Standards Service updated appropriate pilot Practical Test Standards with required testing tasks on RI avoidance during pilot certification.

Pending updates to *FAA Order 8900.1 (9/13/07), Flight Standards Information Management System* will finalize the RI remedial training program and a remedial training syllabus and make it available through FAASafety.gov to assist GA pilots in avoiding RIs. To support this effort, the FAA provides DPE initial training in Oklahoma City at least two times during the year, training more than 50 DPEs yearly. When finalized, pilots contributing to RIs would be required, in certain cases, to complete mandatory remedial training with either a DPE for a Category A or B RI, or a Certified Flight Instructor (CFI) recommended by the FAA Safety Team (FAAST) for a Category C RI.

Flight Standards has also published a new chapter, RI Avoidance, in the Pilot's Handbook of Aeronautical Knowledge. Additionally, Flight Standards updated *Advisory Circular 120-74B Part 121, 125, and 135 Flightcrew Procedures during Taxi Operations (7/30/12)* and *Advisory Circular 91-73B Parts 91 and 135 Single Pilot, Flight School Procedures during Taxi Operations (7/30/12),* directed at aircraft with flight crews, single pilots and flight school operators to address procedures and knowledge needed to avoid RIs.

The FAA "Taxi Test" was produced by the RSG and FAAST and viewed on FAASTeamTV. This 60-minute video provides a comprehensive look at runway safety best practices including a review of signs, markings, and lighting and describes scenarios where particular caution must be observed while taxiing. To date, over 12,500 people have viewed this presentation.

Situational awareness also extends to circumstances that might lead to an RE. To address this need, the FAA worked with the business aviation community in conjunction with the NBAA to produce a 60-minute webinar on runway safety and REs. The webinar was broadcast live to a national audience in FY2014.

5.2.4 AOPA Online Training

The AOPA online runway safety course is a comprehensive training and examination available to both 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, more than 20,000 pilots have completed the course and passed the quiz. An updated course was completed and available in January 2015.

5.3 The National Runway Safety Plan, 2015–2017

The 2015-2017 National Runway Safety Plan, issued on July 31, 2014, sets the stage for future work to enhance and coordinate runway safety activities. The 2015-2017 Plan directly supports the Administrator's Strategic Priorities, including initiatives to "Make Aviation Safer and Smarter" by moving to risk-based decision-making, enabling the safe and efficient integration of NextGen, and demonstrating global leadership in improving air traffic safety and efficiency through data-driven solutions that shape international standards. It also provides guidance for Regional Runway Safety Program Managers for managing regional programs and for conducting outreach activities and LRSAT meetings. It provides strategies on how to conduct outreach and other runway safety activities in a resource-constrained environment. The plan also introduces

the Runway Safety Focus Airport Program, allowing the FAA to focus resources on airports with a need for additional support from the RSG.

5.4 Air Traffic Control Procedures

5.4.1 People and Equipment in the RSA

During FY2014, Office of Airports, Technical Operations and Air Traffic Services worked together to resolve confusion over RSA procedures. They reached an agreement on draft language that clarifies the principles the ATO and the Office of Airports will adopt for people and equipment in the RSAs. That language will undergo a safety assessment using ATO's SMS 4.0 in FY2015. The results will be improved awareness for proper and safe procedures for controlling situations where aircraft and equipment might be inside an RSA.

5.4.2 Approach Hold Procedures

Based on a Safety Risk Management Document (SRMD) under the purview of Runway Safety, notices *FAA JO 7210.863 (3-19-14), Obstacle Identification Surfaces, Obstacle Free Zones, RSAs,* and *Clearways* and *FAA N JO 7110.660 (3-19-14), Taxi and Ground Movement Operations* were posted to mitigate risks associated with Approach Hold procedures.

5.5 Runway Safety Focus Airport Program

In FY2014, the FAA established the Runway Safety Focus Airport Program to address hazards specific to individual airports. The intent of the program is to identify airports that require focused attention and to establish a proactive safety management allocation of resources. The FAA collaborated with MITRE to develop a process to address indicators of current and potential risk at the airports under consideration, thus enabling the FAA to proactively focus on those airports, i.e. before the number of incidents rise. The current risk indicators include actual measured events (e.g. incursions and excursions), whereas potential or latent risk indicators include metrics such as airport design and management and operational changes. Using these metrics, the FAA is assessing and improving policy, guidance, engagement and training strategies to address risk at the focus airports.

5.5.1 Program Overview

Focus airports are identified using a structured decision support process called Multiple Criteria Decision-Making (MCDM). This structured decision support process produces a rank-ordering of the study airports as well as a framework for exploring the tradeoffs between the various contributors to risk.

The MCDM process relies on a set of metrics and their relative contribution to risk. The metrics capture measured or reported data, and the relative contribution of each metric is reflected in weights elicited from the stakeholders.

In 2015, risk factors were examined at 78 airports in the U.S., including the Core 30 airports. These factors provide the basis for the 15 metrics selected by the RSG and shown in Figure 21.

Figure 21.
Runway Safety Metric and Metric Definition/ Scope

1	Airport Operations
3	Surface Incidents
5	Runway Confusion Incidents
7	A/B Incursions (3 years)
9	Airfield Construction
11	Management Change
13	NAS Changes Requiring SMS
15	Operator/Flight School Activity Changes

5.5.2 Airport Assessment

The MCDM process begins with the development of a hierarchy of risk-contributing elements that characterize overall risk. Metrics are used to measure each airport with respect to these attributes, and it is expected that each airport will achieve these objectives in varying degrees. These elements and their metrics are organized by their temporal nature: some are early indicators of possible future events, while others are closer to undesirable outcomes, and still others are measures of actual events that have occurred. Latent factors indicate some degree of known or suspected causality to undesirable outcomes. Warning indicators are an indication based on a report or an inspection, while observed events are actual measured events. Figure 22 reflects this organization of contributing elements and metrics.

Figure 22.
Runway Safety Elements Structure

Airport Geometry Contributions to RIs	Part 139 Inspection Findings	RIs
Management Change	Request for Stakeholder Support	A/B Incursions
NAS Changes Requiring SMS	Surface Reports	Surface Incidents
Airfield Construction		Excursions
Operator/Flight School Activity Changes		Runway Confusion Incidents
Airport Operations		
Enplanements		

The RSG plans to expand the focus airport program during FY2015 – FY2016 to include the evaluation of all 500+ towered airports, while continuing to refine the metrics evaluation process developed in FY2014.

Using this evaluation, the RSG will help each runway safety focus airport develop a comprehensive RSAP and identify action items that will help address potential risk. The goal is to bring the right stakeholders together in order to make surface operations at our airports even safer.

ACCOMPLISHMENTS

Regional-focused RSAT and action plan for Merrill Field (MRI)

Coordination and engagement to develop action plans at Anchorage (ANC) and Juneau (JNU) International Airports

ACTIVITY

Expansion of the Runway Safety Focus Program to evaluate all towered airports

5.6 Runway Safety Program Accomplishments

The FAA Runway Safety Program *(FAA Order 7050.1B)* provides a focal point for all FAA runway safety efforts. A significant portion of this effort revolves around the RSAT which focuses on identifying and resolving safety issues at specific airports by finding and fixing safety issues. Although industry and local outreach through the annual RSAT meetings are important components of the runway safety program, the ultimate goal is to complete action items that provide a meaningful safety benefit for airports.

5.6.1 Eastern Service Area

JOHN F. KENNEDY INTERNATIONAL AIRPORT (JFK)

JFK experienced several PDs at Taxiway H, including one serious PD due to geometry and signage at that location. The ATM convened members from the LRSAT team including Runway Safety, Office of Airports, Flight Standards and the Port Authority to review and discuss the area. The group conducted a site visit of the area and made recommendations to change signage and realign the taxiway. The taxiway has since been realigned and the problem eliminated.

CHARLESTON AIR FORCE BASE/ INTERNATIONAL AIRPORT (CHS)

Technical Operations installed new radios to address radio bleed over, an issue identified during the RSAT open discussion. This corrected a loss in coverage experienced due to the construction of parking decks in the vicinity of the ATCT. New radios were installed in the equipment room on 9th floor of the ATCT. New antennas were installed on the tower roof above the ASDE-X antenna. In addition, the airport hot spot on Taxiway E going to Runway 21 (a runway hold short marking) was removed. A new marking was installed at the required distance from the runway end to eliminate the hot spot.

ORLANDO SANFORD INTERNATIONAL (SFB)

Confusing signage at Hot Spot 1 was changed in the area of Taxiways K and C.

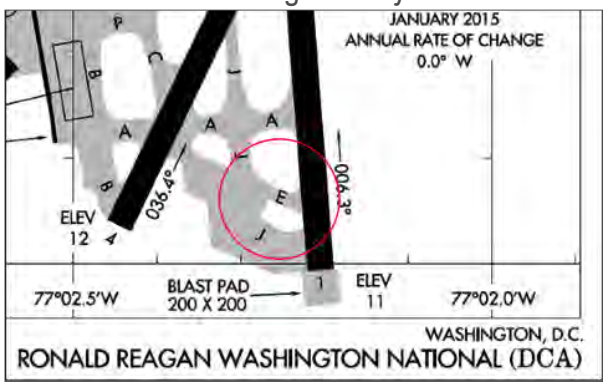
BOWMAN FIELD (LOU)

A directional sign was added for TWY H (<----H---->) when exiting the executive aviation ramp to eliminate pilots from taxiing onto Taxiway H without authorization.

RONALD REAGAN WASHINGTON NATIONAL AIRPORT (DCA)

A workgroup agreed to rename Taxiway J1 to Taxiway E to avoid confusion with Taxiway J, as pilots often mistakenly taxied onto the J1 intersection rather than the assigned Taxiway J for full length departure. A signage plan was developed and approved; the new sign was then installed and published.

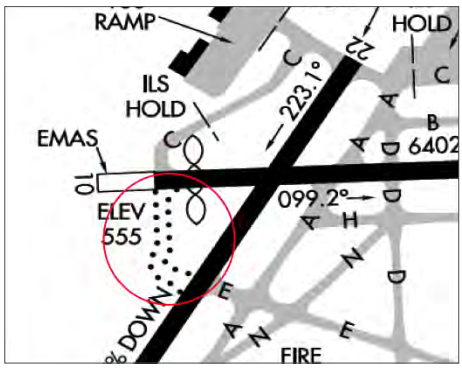
Figure 23.
DCA Safety Improvements: Renaming Taxiway J1



GREATER ROCHESTER INTERNATIONAL AIRPORT (ROC)

Construction of a new taxiway is underway to connect Taxiway E and the Runway 10 threshold to prevent aircraft from having to cross the active Runways 10-28 and 4-22 to reach Runway 10.

Figure 24.
ROC Safety Improvements: Taxiway Construction



ANDREWS FIELD (ADW)

To address the need for consistent application of standard phraseology due to recent surface events, the ADW tower made an effort to focus ground movement phraseology and place special emphasis on controllers utilizing clear, concise standard phraseology as a means of increasing safety on the airport and reducing the opportunities for confusion or misunderstanding.

PATRICK HENRY FIELD (PHF)

Hot spots were published to address the close proximity of the intersection of Runways 7/25 and 2/20.

BURLINGTON INTERNATIONAL AIRPORT (BTV)

Airport operators were unsure when hold areas affecting the instrument landing system (ILS) were in use. In response, BTV ATCT began including on the ATIS broadcast when ILS holding is required. In addition, several GA incidents occurred at the intersection of Taxiway C and Runway 19. To mitigate this issue, the intersection was declared and published as a Hot Spot.

WESTFIELD-BARNES AIRPORT (BAF)

The taxiway hold position sign on the Taxiway A extension approaching Runway 15 was abnormally far from the expected location because of the displaced threshold and resulting Obstacle Free Zone. Pilots often overlooked it and crossed the hold line inadvertently. To solve this problem, a second sign was installed on the opposite side of Taxiway A, increasing visibility of the hold short point.

5.6.2 Central Service Area

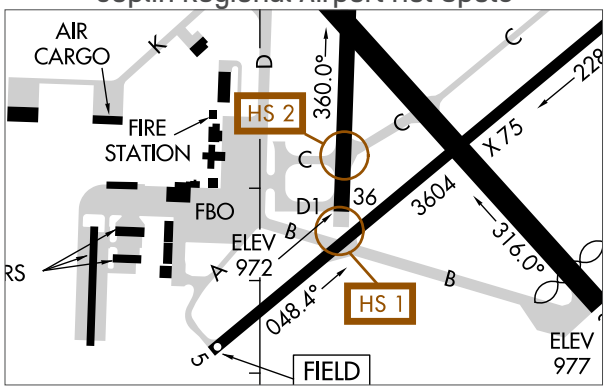
QUAD CITY INTERNATIONAL AIRPORT (MLI)

Runway Safety Workgroup meetings were held to address frequent RIs following a construction project. Short and medium term goals were implemented including airfield markings and controller phraseology which have greatly reduced the number of RIs. Longer term goals are being evaluated, including the possibility of shortening or closing a runway to improve airfield geometry.

JOPLIN REGIONAL AIRPORT (JLN)

A site visit by the regional office to the JLN ATCT noted unusual phraseology being issued to pilots in the area of Hot Spot 1. The ATM noted that pilots often become confused by the unusual geometry in that area. Of greater concern was the potential for pilots to attempt a departure on the wrong runway with only 2500 feet remaining. Analysis of safety data revealed that ATC had stopped aircraft that had lined up on the wrong runway eight times. On another six occasions, pilots had become lost and asked for direction. Using this data, an RSAT in 2012 created over 20 action items for the airfield. Working with the Office of Airports and the airport, major geometry changes were planned and are presently under construction.

Figure 25.
Joplin Regional Airport Hot Spots



WICHITA DWIGHT D. EISENHOWER NATIONAL AIRPORT (ICT)

The airport is building a new terminal that will open in 2015. The location of the new terminal is in an area of the airfield with potentially confusing geometry issues. In addition, there are three access points that could allow direct access to runways during taxi-out, which could result in RIs. Short taxi distance and direct access to the runway from the ramp can also lead to incursions. The Runway Safety Regional Office took a proactive approach to try to mitigate potential risks before the opening of the new terminal. Of particular concern was the Taxiway C2 that allowed direct access from the new ramp to the intersection of Runways 14-32 and 1L-19R. Working with the airport and the Office of Airports, a project was initiated to remove a portion of Taxiway C2, eliminating the potential for a wrong turn to inadvertently allow an aircraft to access a runway/runway intersection area.

DOWNTOWN SHREVEPORT (DTN)

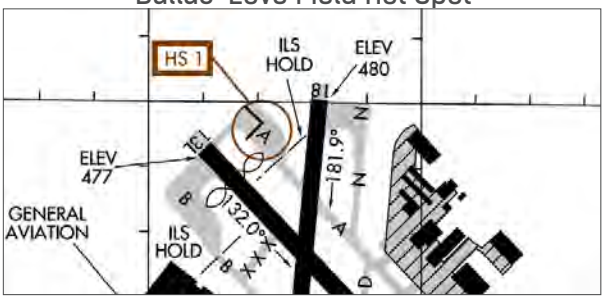
On September 4, 2014, a focused meeting was held at DTN to address seven V/PDs that occurred in a three month span. Representatives in attendance included RS, FSDO, the Office of Airports, local ATC, Shreveport Airport Authority and Louisiana State Aviation Department. The following problems were identified: gates with questionable keypad security, piggy-backing through gates, lack of plain language signage, inadequate driver training, and tenant education regarding visitor admittance. In response, DTN planned new gates and cameras for installation, briefed tenants on new rules and requirements, mandated driver training for obtaining an airport access badge and installed plain language signage at gates and movement areas.

DALLAS-LOVE FIELD (DAL)

A consistent mix of OIs, V/PDs and PDs occurred at various locations throughout the airport in 2012 and 2013. As of 2014, PDs occurred exclusively at the hold short lines for Runways 13L and 13R, with 13 of the 16 RIs occurring at Runway 13L at Taxiway A.

Several mitigations have been implemented: DAL personnel corrected an off-airport power supply issue affecting in-pavement RGLs. The RSG designated and published a Hot Spot and published a FAAST Blast. DAL circulated posters and flyers depicting the intersection and warning pilots of the unexpected location of the hold position markings. The FBOs were also asked to attach the flyers to fuel receipts to increase awareness for itinerant pilots.

Figure 26.
Dallas–Love Field Hot Spot



HOUSTON-DAVID WAYNE HOOKS MEMORIAL (DWH)

After experiencing 16 RIs and four surface incidents, the Regional Runway Safety Program Manager convened a SFRSAT in FY2014.

Following the RSAT, the following fixes were applied: The airport distributed a memo in January 2015 addressing increased V/PDs to property owners and tenants. Gate codes were changed to keep unauthorized personnel off the airport grounds. A driver training template was adopted and an emergency response agreement was established with outside responders.

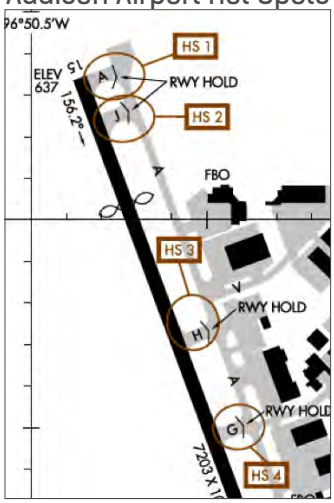
To mitigate point-of-view errors attributable to confusion, vehicle-relevant plain language is being added to airfield guidance signs. Taxiway Q was designated and marked at the north end of Runway 17L. Trees and brush were removed which obstructed visibility to parts of Runway 35L and Taxiway G. In addition, fence improvements and better management of entry points helped improve operations.

All surface painted hold position markings (SPHPM) on the airport have been refreshed and the approach hold designations on either side of Runway 17L have been modified to runway hold designation. “Delta Ramp” and “The Triangle” non-movement areas have also been designated and marked.

ADDISON AIRPORT (ADS)

ADS Airport experienced seven RIs in FY2014. Of these, five were PDs, one was a V/PD and one was an OI. All five PDs resulted from aircraft back-taxiing related to construction.

Figure 27.
Addison Airport Hot Spots



ADS airport has a latent geometry RI hazard in runway hold position locations that jut partially out into the parallel taxiway. The airport, originally designed for Group II aircraft, was reconfigured after Group III operations increased, and the taxiway distance from the runway does not meet Group III design standards. To resolve the issue, nine hot spots were designated, corresponding to the hold position markings at each taxiway. Runway Safety has recently submitted Hot Spot updates wherein the location of the SPHPMs will be depicted on the diagram. Additionally, the ATCT is actively engaged with the local pilots and tenants through a monthly newsletter and hosted a Pilot/Controller Forum in January in conjunction with FAAST. The forum developed a theme of "miscommunications" after observing multiple surface events related to communication breakdown between pilots and controllers. To date in FY2015, ADS has not experienced a single RI. The V/PD trends appear to have been mitigated by initiatives conducted in previous years.

5.6.3 Western Service Area

MERRILL FIELD (MRI)

The airport experienced a high number of V/PDs by tenants and others who routinely access the airfield. A regional focus RSAT meeting developed some critical action items for improving this situation. FAAST and the RSPM will work together to talk with all tenants, lease holders and FBOs at the airport. Their goal is to develop an understanding of the safety issues for all users of the airfield and to present best practices for the proper control of on-airport activities. In addition, the airport will pursue a pilot outreach program through pilot meetings and pamphlets. Finally, the airport will coordinate, develop, and distribute two separate posters that raise the awareness of airport pedestrians and vehicle operators.

ANCHORAGE INTERNATIONAL AIRPORT (ANC)

The RSPM conducted a coordinated engagement of the FAA ATO, The Office of Airports and Flight Standards, as well as the airport operator, to develop an improvement strategy to address procedural compliance. The airport will conduct best practices training to address operational issues and provide refresher training for airport employees, and the airport operations team will ensure complete and effective NOTAM processing for construction projects.

JUNEAU INTERNATIONAL AIRPORT (JNU)

The airport is preparing to start a construction project that will close an active runway and use the parallel taxiway as the runway. Knowing the critical nature of the proposed changes at Juneau, the RSPM developed an action plan through coordination with the FAA Terminal District Manager, the FAA Facility Manager and the airport. A site-specific construction animation tool for the FAA Air Traffic Controllers will be developed as a training aid, the ACAC airport construction diagrams will be developed, weekly construction updates will be published and all parties will be continually engaged via meetings.

HONOLULU INTERNATIONAL AIRPORT (HNL) AND VAN NUYS AIRPORT (VNY)

The Runway Safety Regional Office conducted RSATs during FY2014 at these airports. At HNL, the office conducted a focus RSAT that developed five significant action items, including development of a pilot outreach program, changes to the airport surface markings and signage and a study of the distribution of duties and responsibilities in the tower. The action items included out-of-date movement areas, distribution of tower duties and responsibilities, pilot performance issues, close proximity of Runways 4L and 4R and elevated boundary signs on the taxiways between Runways 4L and 4R.

PHOENIX DEER VALLEY AIRPORT (DVT)

In response to RSG recommendations, air traffic initiated a test where ground control would provide runway crossing instructions to pilots. Prior to the test, the landing pilot may experience three frequency changes in a short and critical area of their taxi route. The test was successful and reduced the number of RIs for pilots crossing the runways to nearly zero.

5.7 Runway Safety Tracking System (RSTS)

The RSTS is a system of records that stores and tracks RSG events, action items, and other information. It is a comprehen-

sive repository of Runway Safety Program events, actions, and runway safety action plans from various sources, including regional and LRSATs.

To date the RSTS has been used to manage in excess of 9,827 action items that were developed to reduce the number and severity of surface events which include RIs, REs, and surface incidents. During FY2013 and FY2014, the Runway Safety Program successfully tracked to completion a total of 889 action items.

5.8 Runway Safety Areas (RSAs)

An 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 RE.

Beginning in 2000, FAA commenced a program to improve all RSAs at commercial service airports to meet current standards to the extent practicable. In 2006, Congressional legislation required completion of these improvements by December 31, 2015. Working with airport sponsors and with support of Airport Improvement Program grant funding, RSA improvements are complete for approximately 528 of 619 runways requiring improvement by 2015. See Figure 28 for the FY2013 – FY2015 schedule.

Several different lines of business — the Office of Airports, Technical Operations and Air Traffic Services — are involved with RSAs, and most had orders and written guidance on how to operate in them. Since universal guidance did not exist, the different lines of business' interpretations and requirements were, in many cases, at odds. The RSG found that confusion and disagreement has existed for years on what can be in an RSA.

A critical success for ATO was the SRM panel convened on December 2-3, 2014 that brought the Office of Airport, Air Traffic, and Technical Operations organizations together to jointly clarify "how to" appropriately access the RSA. This particular element will, in the end, resolve most of the RSA confusion.

5.9 Hot Spots

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

Beginning in August 2009, FAA reduced the time it takes to chart current hot spots by working with the Charting and Aeronautical Navigation Division and using their web portal to enable instant downloads of airport hot spot information. In 2014, Runway Safety spearheaded a successful effort to enhance the charted depiction of hot spots related to the location or specific placement of runway hold lines.

5.10 Safety Alerts for Operators

A Safety Alert for Operators (SAFO) contains important safety information and may include recommended action. SAFO content is valuable to air carriers in meeting their statutory duty to provide service with the highest 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. For example, an August 2, 2013 SAFO addressed safety concerns and techniques when using a runway as a taxiway. FAA Flight Standards published 10 alerts in FY2013 and 7 more in FY2014.

5.11 Wildlife Hazards

The FAA encourages all certificated airports to conduct Wildlife Hazard Assessments (WHAs), even if the airport has not experienced a Part 139 triggering event. The FAA requires airport sponsors to maintain a safe operating environment which includes conducting WHAs and preparing Wildlife Hazard Management Plans when wildlife strikes occur. The Wildlife Hazard Management Plan identifies specific actions the airport will take to mitigate the risk of wildlife strikes on or near the airport. Wildlife hazards and runway safety integrate closely because wildlife strikes represent a significant risk in the NAS.

Wildlife hazard mitigation strategies have proven successful in recent years. Professional wildlife hazard programs at nearly every Part 139 commercial service airport are likely responsible for the decline in reported strikes with damage within the airport environment (less than 500 feet above ground level) from 2000 to 2011 despite continued increases in populations of many large bird species (see Figure 29).

Figure 28.
Airport Improvement Plan (AIP) Funded RSAs Scheduled in FY2013 – FY2015

FY2013

Region	City	State	Location ID	Runway ID
AAL	Juneau	AK	JNU	8/26
AAL	Sitka	AK	SIT	11/29
AEA	Farmingdale	NY	FRG	1/19
AEA	Teterboro	NJ	TEB	1/19
AEA	Trenton	NJ	TTN	6/24
AGL	Milwaukee	WI	MKE	01L/19R
AGL	Milwaukee	WI	MKE	07R/25L
AGL	Columbus	OH	OSU	09R/27L
AGL	Rockford	IL	RFD	7/25
AGL	Springfield	IL	SPI	4/22
AGL	Thief River Falls	MN	TVF	13/31
ANE	Boston	MA	BOS	15R/33L
ASO	Bristol/Johnson/ Kingsport	TN	TRI	9/27
ASW	Beaumont/Port Arthur	TX	BPT	12/30
ASW	Beaumont/Port Arthur	TX	BPT	16/34
ASW	Dallas	TX	DAL	13L/31R
ASW	Lafayette	LA	LFT	04R/22L
AWP	Burbank	CA	BUR	15/33
AWP	Grand Canyon	AZ	GCN	3/21
AWP	Hilo	HI	ITO	3/21
AWP	Kailua/Kona	HI	KOA	17/35
AWP	Lihue	HI	LIH	3/21
AWP	Prescott	AZ	PRC	03/R/21L

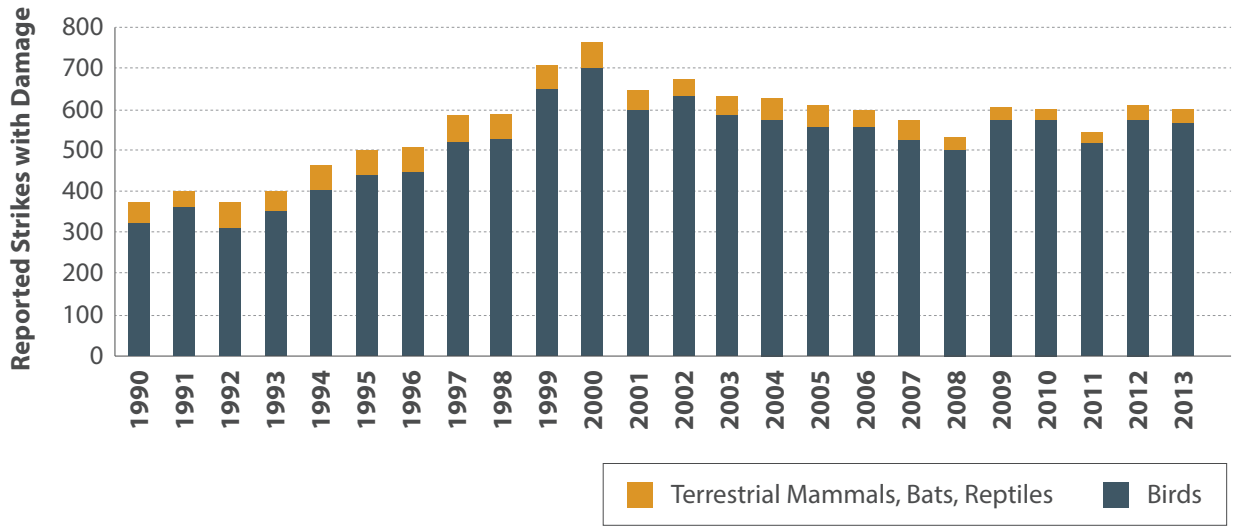
FY2014

Region	City	State	Location ID	Runway ID
AAL	Adak Island	AK	ADK	18/36
AAL	Dillingham	AK	DLG	1/19
AAL	Unalaska	AK	DUT	12/30
AAL	Nome	AK	OME	3/21
ACE	Hutchinson	KS	HUT	4/22
ACE	Hutchinson	KS	HUT	13/31
AEA	Baltimore	MD	BWI	15R/33L
AEA	Newark	NJ	EWR	11/29
AEA	New York	NY	LGA	13/31
AGL	Cleveland	OH	BKL	06L/24R
AGL	Battle Creek	MI	BTL	05L/23R
AGL	Cahokia/St. Louis	IL	CPS	12R/30L
AGL	Evansville	IN	EVV	4/22
AGL	Sioux Falls	SD	FSD	3/21
AGL	Gary	IN	GYY	12/30
AGL	Chicago	IL	ORD	09R/27L
AGL	Rochester	MN	RST	13/31
ANE	Boston	MA	BOS	15L/33R
ANE	Rutland	VT	RUT	1/19
ASO	San Juan	PR	SJU	13/31
ASW	Fort Worth	TX	AFW	16L/34R
AWP	Fresno	CA	FAT	11L/29R
AWP	Lahaina	HI	JHM	2/20
AWP	Lanai City	HI	LNY	3/21
AWP	San Diego	CA	SAN	9/27
AWP	San Francisco	CA	SFO	10L/28R
AWP	San Francisco	CA	SFO	10R/28L
AWP	Santa Rosa	CA	STS	1/19

FY2015

Region	City	State	Location ID	Runway ID
AAL	Adak Island	AK	ADK	5/23
AAL	Kodiak	AK	ADQ	7/25
AAL	Kodiak	AK	ADQ	18/36
AAL	Galbraith Lake	AK	GBH	12/30
AAL	Nome	AK	OME	10/28
AAL	Prospect Creek	AK	PPC	18/36
AEA	Baltimore	MD	BWI	15L/33R
AEA	Washington	DC	DCA	15/33
AEA	Washington	DC	DCA	4/22
AEA	New York	NY	JFK	04L/22R
AEA	New York	NY	JFK	13L/31R
AEA	New York	NY	LGA	4/22
AEA	Philadelphia	PA	PHL	9R/27L
ANE	Bridgeport	CT	BDR	6/24
ANE	Bridgeport	CT	BDR	11/29
ANE	Providence	RI	PVD	16/34
ANM	Denver	CO	BJC	11L/29R
ASW	Tulsa	OK	TUL	18R/36L
AWP	Crescent City	CA	CEC	11/29
AWP	Crescent City	CA	CEC	17/35
AWP	Honolulu	CA	HNL	04R/22L
AWP	Los Angeles	CA	LAX	06L/24R
AWP	Los Angeles	CA	LAX	06R/24L
AWP	Los Angeles	CA	LAX	07L/25R
AWP	Merced	CA	MCE	12/30
AWP	Monterey	CA	MRY	10R/28L
AWP	Oakland	CA	OAK	09R/27L
AWP	Oakland	CA	OAK	11/29
AWP	Oakland	CA	OAK	09L/27R
AWP	San Francisco	CA	SFO	01L/19R
AWP	San Francisco	CA	SFO	01R/19L
AWP	Santa Rosa	CA	STS	14/32

Figure 29.
Wildlife Strikes to Civil Aircraft in the U.S., 1990–2013



A proposed rule that requires mandatory WHAs is currently on hold because of the success of voluntary efforts by airports to complete the assessments and to develop Wildlife Hazard Management Plans. All Part 139 airports have completed or initiated a WHA. A key measure for tracking the hazards associated with wildlife is the level of reporting for wildlife strikes at airports. The FAA estimates that 39 percent of all wildlife strikes are currently reported. The FAA recently updated a study to determine the latest reporting rates based on data from 2010 to 2013.

5.12 Aviation Safety Standdown

The FAA-sponsored Aviation Safety Standdown incorporates thousands of aviation safety seminars throughout the country each year. "Building a Safety Community" was the theme for the 2014 FAAST Safety Standdown. Some 700 corporate pilots annually participate in Runway Safety's Bombardier Safety Standdown held in Wichita, KS. 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.

5.13 Safety Technology Initiatives

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.

5.13.1 Engineered Materials Arresting System (EMAS)

The EMAS provides a safety enhancement on runway ends where there is not enough level, cleared land for a standard RSA. The purpose 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. It is intended to stop aircraft that overshoot a runway when there is an insufficient free space for a standard RSA.

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.

To date, EMAS has a 100 percent success rate. Today, EMAS is installed at 83 runway ends at 53 airports in the U.S. Since 1999, EMAS has successfully arrested nine aircraft overruns at seven different airports. The most recent save occurred at Palm Beach International Airport in West Palm Beach, FL in October 2013. Recent EMAS installations include Memphis, TN; Burke Lakefront in Cleveland, OH; San Francisco, CA; T.F.

Green in Providence, RI; Addison, TX; and Reagan National in Arlington, VA.

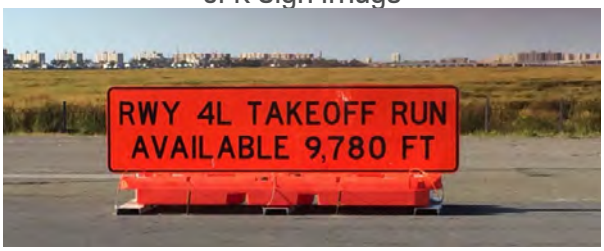
5.13.2 Airport Signs, Marking and Lighting

The Office of Airports updates standards for runway marking, signs and airfield lighting. Advisory Circular 150/5340-1L (September 2013) modifies and clarifies several airfield marking standards that promote safer airfield operations:

- *Taxiway edge marking at entrance taxiways*
- *Ramp control markings*
- *Marking criteria for intersecting runways*
- *Intermediate holding position marking for taxiway/taxiway intersections*

A significant number of V/PDs and other airport hazards appear to be construction-related. Contractor personnel and vehicles, increased airfield activity, and temporary airfield changes create risks for V/PDs. The Office of Airports continue to work with the ACAC to eliminate runway safety risks associated with construction activities. One initiative from the ACAC is the use of orange airfield signs to identify recent or temporary airfield changes during construction periods is an important initiative that can increase runway safety. The Office of Airports is working with the William J. Hughes Technical Center to evaluate the use of these signs at John F. Kennedy International Airport (JFK). Also, plans to test signs at Los Angeles International Airport (LAX) are being discussed. These signs were previously and successfully tested at Islip, NY (ISP), Chicago O'Hare (ORD), Portland (PDX), Providence, RI (PDV) and Orlando Sanford (SFB) airports. The FAA expects to publish standards for their use in 2015.

Figure 30.
JFK Sign Image



The Office of Airports is also conducting research and development through the Technical Center in an effort to standardize signage and markings for protected areas surrounding runways. This includes approach and departure surfaces and RSAs. Currently, ATC phraseology and movement area procedures concerning these areas vary from airport to airport, leading to potential confusion and uncertainty for vehicle drivers and pilots. The study is evaluating new signage and markings at Chicago O'Hare International Airport (ORD), Cleveland Hopkins International Airport (CLE) and Nashville International Airport (BNA). A final report with signage and marking recommendations will be available in 2015.

5.13.3 Research and Emerging Technologies

The Airport Technology Research Program encompasses a 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 ARFF. Current research includes work on several runway safety subject areas such as wildlife hazards and EMAS. In wildlife hazards, research focuses on the assessment of detection systems and their integration approaches to reducing wildlife strikes with aircraft. The goal is to help integrate research findings into airport operations, the air traffic control environment, and the aviation industry as a whole. The FAA continually promotes investigation into 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 Center for Risk Management, MITRE Corporation, the U.S. Department of Transportation's Volpe Center and other groups located both in the U.S. and abroad.

5.13.4 NextGen and Runway Safety

NextGen is a comprehensive overhaul of the NAS to provide increased capacity and better operational performance. NextGen will reduce congestion and meet projected demand in an environmentally sound manner. 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 of the air transportation system in the U.S. 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 also 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.

5.13.5 Improved Runway Safety Situational Awareness for Pilots and Controllers

Enhanced surface displays, which alert controllers when an RI is imminent and provide pilots greater awareness of their location on the airport surface, are being developed and deployed to improve runway safety.

5.13.6 Improved Runway Safety Situational Awareness for Controllers

At 28 large airports, current controller tools provide surface displays and can alert controllers when aircraft taxi into areas where an RI could result. Additional ground-based capabilities, including ASDE-X, and multilateration systems that provide target position of all transponder-equipped aircraft and Automatic Dependent Surveillance Broadcast (ADS-B) equipped ground vehicles on the airport surface movement area, as well as aircraft flying within five miles of the airport, will be developed for display in the airport control tower.

5.13.7 Improved Runway Safety Situational Awareness for Pilots

Runway safety operations are improved by providing pilots with greater awareness of their location on the airport surface as well as RI alerting capabilities. Electronic Flight Bags (EFB) that include a moving map system will increase situational awareness, thus reducing the likelihood of RIs in low-visibility conditions, such as darkness or heavy precipitation. The FAA has approved the moving map system for use. *The Advisory Circular 120-76C, Guidelines for the Certification, Airworthiness, and Operational Use of EFBs (May 2014)* provides guidance to operators and flight crews for transitioning from the paper materials in a traditional flight bag to electronic formats.

Figure 31.
Airports with Enhanced Surface Displays

Airports			
ATL	DTW	LAX	PHL
BOS	FLL	LGA	PHX
BWI	EWR	MCO	SAN
CLT	IAD	MEM	SEA
DCA	IAH	MIA	SFO
DEN	JFK	MSP	SLC
DFW	LAS	ORD	

The FAA and industry are partnering to develop a taxi benefit for aircraft equipped with certified enhanced vision systems. Currently, Enhanced Flight Vision System-equipped operators can use their systems only for approved situational awareness and safety while on the ground. Some operators have requested that they be authorized taxi benefits when their company's weather minimums are lower than an airport's weather operating minimums and if their aircraft are equipped with the systems. The FAA is evaluating the feasibility of this request in concert with other activities related to improved low-visibility surface operations.

FAA Flight Standards collaborated with MITRE on their Low-Cost RI Prevention project directed at reducing or eliminating RIs by GA aircraft. It is an application on a mobile device such as a smartphone that uses speech recognition to capture the "hold short" instructions communicated by the controller then presents these same instructions on the handheld device's display panel. It watches speed and heading, and when it appears the aircraft is not going to stop at the hold line, the application issues a warning, both audibly and on the display. After testing the system with 100 members of the AOPA between November 2011 and January 2012, MITRE and FAA decided to allow the software to be available for commercial software developers. Today, aviation application vendor ForeFlight has added the software into its own ForeFlight Mobile application, and several other vendors are considering doing the same.

5.13.8 Runway Status Lights (RWSL)

RWSL integrates airport lighting equipment with approach and surface surveillance systems to provide a visual signal to pilots and vehicle operators indicating that it is unsafe to enter, cross, or begin takeoff on a runway. In July 2013, the FAA's Joint Resources Council (JRC) approved the reduction in the number of airports that would receive a RWSL system from 23 to 17. Those six sites not approved for RWSL will be addressed in a second phase of the program in which the agency will analyze technology and non-technology alternatives to directly

address RIs through the SSIT and CARA processes. Since the program re-baseline, the RWSL program has made steady progress with installations complete at Orlando (MCO), Washington Dulles (IAD), Phoenix (PHX), Houston (IAH), Seattle (SEA), Las Vegas (LAS), Charlotte (CLT), and Minneapolis (MSP). The remaining systems will be deployed by 2017. The effectiveness of this system is illustrated by a recent event at Seattle-Tacoma International Airport where a crossing air carrier flight crew saw the red RWSL lights and stopped short of the hold line for a runway on which another air carrier had mistakenly begun a departure roll.

5.13.9 Integrated Safety Assessment Model (ISAM)

The ISAM is an integrated pilot and controller model, utilizing safety modeling techniques known as Event Sequence Diagrams. These isolate and describe the sequence of events that occur at airports with surface surveillance systems that led to an accident or serious incident. Integrated Event Sequence Diagrams define fault trees, which explicitly depict the underlying events that were necessary for the incident to occur. The ISAM has defined the Event Sequence Diagrams which denote RIs and is working to identify the causality of the events utilizing this methodology. Currently, the ISAM can only be applied to airports with a surface surveillance system in operation. The ISAM has two goals:

- *To provide the risk baseline of the current NAS against which the risk of future system changes can be measured*
- *To forecast the risks and safety impacts of implementing surface safety changes*

Data derived from air traffic and airport operations, engineering, and safety risk assessments sources will provide

Figure 32.
Runway Status Lights Deployment Schedule

Site	Initial Operating Capability No Later Than Date (to support Operational Ready Date)	JRC Rebaseline Waterfall Date (Acquisition Program Baselines Last Site Operational Readiness Date – Sept 2017)
MCO	7/29/2011 (Complete)	8/14/2013 (Complete)
IAD	7/24/2013 (Complete)	7/21/2014 (Complete)
PHX	8/21/2013 (Complete)	3/11/2014 (Complete)
IAH	9/12/2013 (Complete)	4/9/2014 (Complete)
MSP	1/16/2014 (Complete)	Q1, FY15 (Delayed because the site technical ops was not able to complete the ILC replacement due to Chicago Air Route Traffic Control Center work moratorium)
SEA	3/12/2014 (Complete)	8/20/2014 (Complete)
LAS	4/30/2014 (Complete)	10/17/2014 (Complete)
CLT	11/20/2014 (Complete)	Q2, FY15 (At risk due to the site operating on the essential power and not on critical power)
FLL	1/15/2015 (Complete)	Q2, FY15
ORD	Q1, FY15 (Currently projecting November 2015 based on delays of light installations by the City of Chicago)	Q3, FY15
DTW	Q1, FY15 (Currently projecting June 2015 due to limited available Technical Operations support, travel funding constraints, and avoiding winter ILC work)	Q3, FY15
LGA	Q1, FY15 (Currently projecting April 2015 due to limited available Technical Operations support for optimization, travel funding constraints for tech certification training, access issues, and avoiding completing CAI punch list items during winter)	Q3, FY15
LAX	Q3, FY15	Q1, FY16
EWR	Q4, FY16	Q2, FY17
BWI	Q1, FY17	Q3, FY17
JFK	Q1, FY17	Q3, FY17
SFO	Q1, FY17	Q3, FY17

insight into current system vulnerabilities and help plan future mitigation requirements.

5.13.10 Surface Navigation for Aviation Professionals

FAA's Flight Standards Service developed the Surface Navigation for Aviation Professionals Action Plan. Its actions are aimed at:

- *Improving pilot knowledge*
- *Improving airmen awareness of the elements that can induce an RI*
- *Initiating a new FAA enforcement remedial training process for GA pilots who cause RIs*

The process, based upon a national baseline RI curriculum, employs the services of DPEs and CFIs.

The FAA's Flight Standards Division continues to develop mitigations to avoid REs, through its participation in Takeoff and Landing Performance Assessment (TALPA). In January 2013, the Office of Airports, Flights Standards and Air Traffic lines of business agreed to a TALPA implementation package. This package will encourage the voluntary use of standard terminology and procedures for communicating runway conditions among airports, air traffic, aircraft manufacturers and pilots.

Flight Standards is also developing a non-regulatory method to include specific FAA areas of concern relative to GA accidents, i.e., avoidance of both an RI and an RE, and other areas of concern.

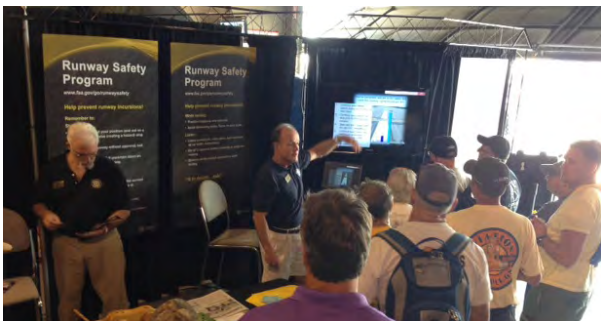
5.14 Runway Safety Outreach & Multimedia

Safety promotion is an important component of an SMS that focuses and maintains attention on safety from various airport users such as airport operators, pilots, and air traffic controllers. During the FY2013 – FY2014 time frame, the FAA began to transition runway safety outreach efforts from those based on printed materials and CDs to an emphasis on portable devices and mobile applications. Runway safety promotion products (videos, presentations, playbacks, interactive mobile applications) are available online for outreach activities.

5.14.1 Outreach

The FAA supported numerous industry events to raise awareness of pilots, controllers, and drivers of the risks associated with surface operations, as well as identifying best practices and other guidance. These events included: EAA Airventure, NBAA Annual Convention, Bombardier Safety Standdown, AAAE Runway Safety Summit, DPE training, and the ASIAS InfoShare Conference, Cessna Single Pilot Safety Standdown, Cessna Owner's Conference, Mid America Aviation Symposium. Thousands of pilots, mechanics, dispatchers and aviation professionals have been exposed to the runway safety message at these events.

Runway Safety Program 2014
EAA AirVenture Oshkosh Booth



5.14.2 Runway Safety Sourcebook

In FY2014, the FAA developed a web-based outreach toolkit called the Runway Safety Sourcebook. The Runway Safety Sourcebook is available to all FAA employees online. The sourcebook provides FAA leaders with materials and information on runway safety topics to be used in outreach, conferences, and meetings. This allows all FAA employees to be advocates for the Runway Safety Program, with consistent, up-to-date message and data.

A QA Safety Bulletin specifically discussing runway safety and taxiing on runways was published in June 2014 and linked to the Runway Safety Sourcebook.

ACCOMPLISHMENT

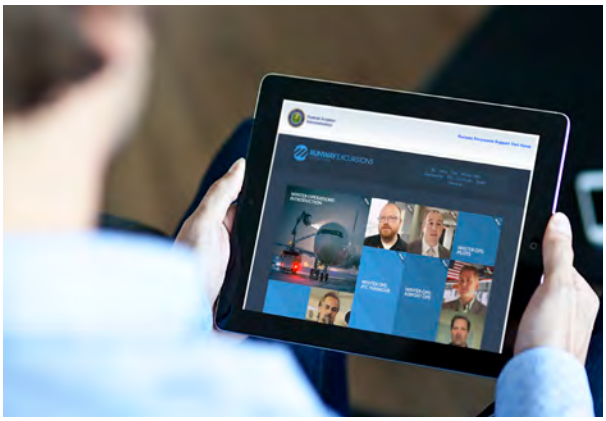
Fix: QA Safety Bulletin: Taxiing on Runways: June 2014

5.14.3 Runway Safety Mobile – Runway Excursions

The RE Support Tool is a mobile website consisting of a collection of videos and reference materials that articulate a shared responsibility for preventing REs. REs constitute the majority of runway accidents and fatalities. The

RE Support Tool was developed through a collaboration between FAA, NATCA and CANSO. In December 2014, the tool was updated to address hazards involved during winter operations. On March 24, 2014, the FAA launched the REs mobile website on the FAA web subdomain, http://runwayexcursions.faa.gov/.

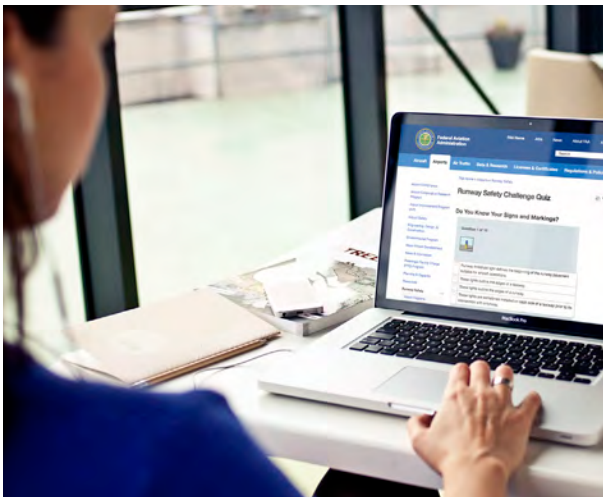
Runway Excursion Support Tool



5.14.4 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: http://www.faa.gov/airports/runway_safety/equiz/. Each question consists of an image and four possible answers. All information provided is anonymous. By tracking responses, the information helps the RSG 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, flight instructor refresher clinics (FIRCs) and other gatherings.

Runway Safety Challenge Quiz



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 FIRCs. This data is then collected and analyzed to measure the competence and knowledge levels of pilots across the NAS.

The RSG 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.

5.14.5 FAA Design Competitions for Universities 2014–2016

The FAA recently selected winners for its eighth annual Design Competition for Universities. Top honors went to student teams from the University of Rhode Island, the University of Colorado Boulder and Roger Williams University.

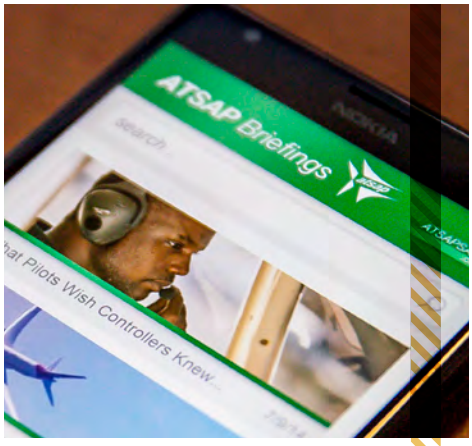
FAA Design Competition for Universities Winners FY2013 and FY2014

The competition seeks to engage students at U.S. colleges and universities in addressing issues facing airports while providing quality educational experiences and exposure to aviation and airport-related careers. Students were invited to propose in four technical challenge areas: airport operations and maintenance, runway safety, airport environmental interactions and airport management and planning. The competition requires that students work with a faculty advisor and that they reach out to airport operators and to industry experts to obtain advice and to assess the practicality of their proposed designs/solutions.

This competition is managed for the FAA by the Virginia Space Grant Consortium based in Hampton, VA. Partnering organizations are: AAAE, Airport Consultants Council, Airports Council International – North America, National Association of State Aviation Officials and University Aviation Association. Partners assist in developing competition guidelines, providing expert advisors for teams, disseminating competition information to organizational members and participating in design reviews.

Panels of FAA, industry and academic experts selected the winning proposals. Students from winning teams equally divided cash prizes. First place teams received their awards and presented their work at FAA Headquarters in Washington, D.C. In addition, they presented their designs as the lunch keynote speakers at the Airport Consultants Council Airports Technical Workshop in Arlington, VA. Promising designs may also have received FAA funding to take their concepts to the next stage of development. Copies of designs receiving first, second or third place awards are available at the competition website: http://vsgc.odu.edu/ACRPDesignCompetition/.

It will continue to be managed by the Virginia Space Grant Consortium with FAA sponsorship but under the auspices of the Airport Cooperative Research Program of the Transportation Research Board.



Appendix A
ATSAP Accomplishments

ACCOMPLISHMENT: BOSTON TRACON (A90) NOTAM COORDINATION

ISSUE: Ongoing issues since May 2007 have concerned proper and complete coordination of airport opening, airport closing, runway opening and runway closing NOTAMs information between Lockheed Martin AFSS facilities and ATO field facilities. The required NOTAM coordination was not being disseminated to Boston TRACON. The NOTAM coordination between Lockheed Martin and ATO field facilities had been a long running issue with many attempts at correcting the problem. The failed/missing coordination introduced additional risk into the NAS.

RESOLUTION: Lockheed Martin personnel were provided training on the correct interpretation of requirements, and the Flight Service Program Office will conduct periodic inspections to monitor compliance.

ACCOMPLISHMENT: LIGHT-EMITTING DIODE (LED) LIGHTS

ISSUE: ATSAP reports identified a potential safety concern regarding LED surface lighting. Employees at three facilities using LEDs reported problems associated with lighting visibility and runway visual range readings. Mixing LED lights and conventional lights causes system alarms and appears to affect the ambient light sensor which may affect the runway visual range calculation.

RESOLUTION: Interim and final corrective action are to update firmware in the LED fixtures to adjust the dimming curve. New LED fixtures have the updated firmware built in. If the original issues persist the implementation of the new standards will need to be assessed by the Office of Airports and the FAA Technical Center.

ACCOMPLISHMENT: AIR ROUTE TRAFFIC CONTROL CENTER (ARTCC) RADAR DISPLAY IMPROVEMENTS

ISSUE: An ARTCC updated its radar displays to provide more relevant information to controllers regarding runway length at area airports.

However, the new airport indicators were scaled to the scope range and became unviewable when the scope was set a larger area range, i.e. 150 miles or more. The presentation scale hindered controllers' ability to discern emergency use airports.

RESOLUTION: The facility revisited the new settings and provided each area the opportunity to agree to use the new settings or return to the older settings based on the area's needs due to sector arrangements and the typical ranges used for sector operations.

ACCOMPLISHMENT: DENVER INTERNATIONAL AIRPORT (DEN) ATCT WIND PHRASEOLOGY

ISSUE: At DEN ATCT, controllers previously provided wind advisories as "wind 230@10, Runway 17 right, cleared for takeoff." Controllers are now instructed to say "threshold" or "departure" in conjunction with the wind issuance. This phraseology confused the pilots and controllers. Many pilots asked for clarification on a departure frequency change. Controllers were having issues with giving correct wind phraseology when wind shear is present. This excessive phraseology led to confusion for pilots.

RESOLUTION: DEN ATCT is one of the few ATCTs in the country that utilizes the Low-Level Wind-Shear Alert System-Network Expansion system. DEN ATCT's Letter to Airmen already specifies that the wind data provided to departures will be derived from the departure end of the runway, and the wind data provided to arrivals will be derived from the threshold end of the runway. As per guidance from the Western Service Area Operations Support Group, the facility decided to issue wind advisories as they have in the past. DEN terminal controllers were then instructed to revert back to the previous method of issuing the wind by eliminating the requirement to use the terms departure/threshold in conjunction with the issuance of runway winds.

ACCOMPLISHMENT: SEATTLE-TACOMA INTERNATIONAL AIRPORT (SEA) TOWER RUNWAY CROSSING

ISSUE: Due to tower runway crossing phraseology, pilots were aborting take-off roll for fear of aircraft crossing a runway.

RESOLUTION: Four flight safety reports indicated pilot apprehension at hearing runway crossings given while on take-off roll. Although the crossings were for aircraft behind, the procedure distracted pilots at a critical flight phase. The reports were collaboratively shared to SEA ATCT. SEA NATCA and SEA ATCT management reviewed runway crossing operations, and they have applied "fine tuning" to crossing phraseology conforming to *FAA JO 7110.65 3-7-2,* that specifies crossing points to help alleviate pilot concerns. In addition, the reports were shared to the *7110.65* rewrite group, which will use the reports to review changes in crossing phraseology.

ACCOMPLISHMENT: LOS ANGELES INTERNATIONAL AIRPORT (LAX) TAXIWAY SIGN

ISSUE: A submitter from LAX reported that Taxiway E11 and Taxiway S south of E are quite close together. As a result, aircraft often turn onto

the wrong taxiway when instructed to turn onto Taxiway S. On numerous occasions, aircraft have come close to clipping wings, especially when larger aircraft are involved.

RESOLUTION: New taxiway signage was installed on March 21, 2014, thereby alleviating the issue.

ACTIVITY: AIRCRAFT CLEAR OF RUNWAY

There is discontinuity between *FAA Order 7110.65, AIM* and other regulations or orders such as *SFO Standard Operating Procedure, FAA Order 7220.21 (chg2),* when applying separation to a "clear" runway by definition and/or procedure. Air Traffic Services is currently working to fix this issue.

ACTIVITY: RUNWAY CONFIGURATIONS-TAILWIND/ CROSSWIND OPS

Note: *Corrective Action Requests CAR-2011-018 N90* and *CAR-2011-024 IAH were closed and combined into CAR-2012-009 RWY Configurations-Tailwind Crosswinds Ops.*

ISSUE: ATSAP reports indicate situations where aircraft are assigned runways under strong crosswind conditions or tailwinds in excess of ten knots, presenting flight crews with the options of a long delay for the preferred runway, diversion to an alternate airport, or operating at or above their aircraft's operational limits. The ATC system is further stressed by additional pilot/controller communication and coordination, the issuance of excessive delaying vectors, and airborne holding. The following operational issues can occur: go-arounds, longer than expected rollouts, increased controller workload, loss of land and hold short operations, increased runway crossings and aircraft exceeding performance capabilities. Pilots can become conditioned to operate their aircraft in situations which exceed normal operating standards by accepting runway assignments with a tailwind component.

RESOLUTION: The *FAAO 8400.9 (11/9/81), National Safety and Operational Criteria for Runway Use Programs* is being revised. When finalized, new maximum crosswind/tailwind components will be established, and all the associated AT documents *(FAAO 7110.65, 7210.3 and 7050.1B)* will be changed to reflect the new requirements for runway selection. Next, Air Traffic Services will direct the ATMs at all Part 139 airports to conduct a Runway Selection Safety Team (RSST) meeting per the following directions:

1. The RSST will establish a maximum tailwind/crosswind component for each runway at their respective airport, which will be used by the ATCT to determine the airports runway configuration.
2. Each facility ATM must assess their runway configuration decision making with respect to tailwind/crosswind operations to ensure that the maximum tailwind/crosswind component established by the RSST is correct.
3. Each ATM must advise the Operational Support Group through the district manager when this requirement has been accomplished.

Appendix B
Acronyms

AAAE	American Association of Airport Executives
AAT	Alternatives Analysis and Benefits Case Team
ACAC	Airport Construction Advisory Council
ADAR	Adapted Departure and Arrival Route
ADR	Adapted Departure Route
ADS-B	Automatic Dependent Surveillance Broadcast
ADW	Arrival Departure Window
AFSS	Automated Flight Service Station
AIM	Aeronautical Information Manual
AIP	Airport Improvement Plan
ALPA	Air Line Pilots Association
AMASS	Airport Movement Area Safety System
AOPA	Aircraft Owners and Pilots Association
ARFF	Aircraft Rescue and Fire Fighting
ASAP	Aviation Safety Action Programs
ASDE-X	Airport Surface Detection Equipment
ASIAS	Aviation Safety Information Analysis and Sharing
ATC	Air Traffic Control
ATCT	Airport Traffic Control Tower
ATIS	Automatic Terminal Information Service
ATM	Air Traffic Management
ATO	Air Traffic Organization
ATSAP	Air Traffic Safety Action Program
CANSO	Civil Air Navigation Services Organization
CAR	Corrective Action Request
CARA	Comprehensive Airport Review and Assessment

CARP	Comprehensive Airport Review Plan
CAST	Commercial Aviation Safety Team
CEDAR	Comprehensive Electronic Data Analysis and Report
CFI	Certified Flight Instructor
CICTT	CAST/ICAO Common Taxonomy Team
CISP	Confidential Information Share Program
CRO	Converging Runway Operations
DPE	Designated Pilot Examiner
EFB	Electronic Flight Bags
eLMS	eLearning Management System
EMAS	Engineered Materials Arresting System
ERC	Event Review Committee
E-SCAN	Electronic Scan
FAA	Federal Aviation Administration
FAAST	FAA Safety Team
FBO	Fixed Base Operators
FIRC	Flight Instructor Refresher Clinics
FSPO	Flight Service Program Office
GA	General Aviation
GIS	Geographic Information System
IATA	International Air Transportation Association
ICAO	International Civil Aviation Organization
ILS	Instrument Landing System
ISAM	Integrated Safety Assessment Model
JRC	Joint Resources Council
LED	Light-Emitting Diode
LOA	Letter of Agreement
LRSAT	Local Runway Safety Action Team
LSC	Local Safety Council
LUAW	Line Up and Wait
MBI	Mandatory Briefing Item
MCDM	Multiple Criteria Decision-Making
MOR	Mandatory Occurrence Report
NAS	National Airspace System
NASA	National Aeronautics and Space Administration
NATCA	National Air Traffic Controllers Association

NBAA	National Business Aviation Association
NextGen	Next Generation Air Transportation System
NOTAM	Notices to Airmen
NTSB	National Transportation Safety Board
OI	Operational Incident
OSA	Operational Skills Assessment
PD	Pilot Deviation
PFS	Partnership for Safety
PRM	Precision Runway Monitoring
QAP	Quality Assurance Program
QA/QC	Quality Assurance/Quality Control
RAE	Risk Analysis Event
RAP	Risk Analysis Process
RCAT	Root Cause Analysis Team
RE	Runway Excursions
RGL	Runway Guard Lights
RI	Runway Incursions
RIAT	Runway Incursion Assessment Team
RIM	Runway Incursion Mitigation
RRSAT	Regional Runway Safety Action Team
RRSS	Regional Runway Safety Seminars
RSA	Runway Safety Area
RSAP	Runway Safety Action Plans
RSAT	Runway Safety Action Teams
RSC	Runway Safety Council
RSG	Runway Safety Group
RSST	Runway Selection Safety Team
RSTS	Runway Safety Tracking System
RTCA	Radio Technical Commission for Aeronautics
RWSL	Runway Status Lights
SAFO	Safety Alert for Operators
SFRSAT	Special Focus Runway Safety Action Team
SID	Standard Instrument Departure
SMS	Safety Management System
SPHPM	Surface Painted Hold Position Markings
S-RAP	Surface Risk Analysis Process

SRM	Safety Risk Management
SRMD	Safety Risk Management Document
SSC	Safety Standing Committee
SSIT	Surface Safety Initiatives Team
SSR	System Service Reviews
STARS	Standard Terminal Automation Replacement System
TALPA	Takeoff and Landing Performance Assessment
V/PD	Vehicle/Pedestrian Deviation
WHA	Wildlife Hazard Assessment

Appendix C

Runway Incursions by Airport

Historical Data

Runway Incursion Data for 2004 through 2014 by Airport (Sorted by State)

Airport, City	Code	Region	Fiscal Year	SEVERITY					Total RIs	Annual RI Rate	Other Events, Non-RIs
				A	B	C	D	E			
ALABAMA											
Birmingham-Shuttlesworth Intl, AL	BHM	ASO	2004						0	0	6
			2005				1		1	0.669460549	1
			2006			1	1		2	1.406855607	3
			2007	1					1	0.72382469	4
			2008			2			2	1.510574018	1
			2009				1		1	0.909860154	1
			2010			1			1	0.922986044	1
			2011			1	1		2	1.862214732	0
			2012				1		1	0.963186993	0
			2013				1		1	1.02461116	0
			2014			1			1	1.061683831	2
Dothan Regional, AL	DHN	ASO	2010			1			1	1.277645045	0
Huntsville Intl-Carl T Jones Field, AL	HSV	ASO	2004						0	0	2
			2005						0	0	1
			2006						0	0	2
			2007						0	0	4
			2008				2		2	2.220100793	1
			2009				2		2	2.598482486	1
			2010			1	1		2	2.391086031	0
			2011				1		1	1.292473924	1
			2013				1		1	1.666416704	0
			2014						0	0	3
Mobile Downtown Airport, AL	BFM	ASO	2006						0	0	2
			2009			1	1		2	2.41873065	0
			2011			1	5		6	7.717935195	2
			2012				8		8	11.24653817	0
			2013				7		7	9.349539201	0

NOTE: *In 2007, the FAA changed the way we counted total runway incursions to align with our international partners. At that point, we started including – under Category "D" – runway incursion events that did not involve another vehicle/aircraft. Prior to late 2007, those events were not included in this data set.*

N/A: *The FAA does not maintain operations counts for system performance purposes for these airports. Therefore, the runway incursion rate is not available.*

Runway Incursion Data for 2004 through 2014 by Airport (Sorted by State)

				SEVERITY							
Airport, City	**Code**	**Region**	**Fiscal Year**	**A**	**B**	**C**	**D**	**E**	**Total RIs**	**Annual RI Rate**	**Other Events, Non-RIs**
			2014			1	4		5	7.889919838	1
Mobile Regional, AL	MOB	ASO	2006				1		1	0.943262746	4
			2007				1		1	1.055230779	2
			2012				1		1	1.144701748	0
Montgomery Regional (Dannelly Field), AL	MGM	ASO	2004						0	0	1
			2005				1		1	1.49931781	0
			2006						0	0	1
			2009			1			1	1.500262546	0
			2012				1		1	1.546933977	0
Tuscaloosa Regional, AL	TCL	ASO	2008			1			1	1.883948757	0
ALASKA											
Bethel Airport, AK	BET	AAL	2004				3		3	2.803161967	1
			2005			1			1	0.971958983	2
			2006				1		1	1.001833355	1
			2008				2		2	2.033574312	0
			2012			1	1		2	2.0155195	0
			2013				3		3	3.127899824	0
			2014				4		4	4.51645684	1
Fairbanks Intl, AK	FAI	AAL	2004			1	2		3	2.403152937	4
			2005			2	2		4	3.524694894	9
			2006				2		2	1.782594745	7
			2007				2		2	1.847216706	7
			2008				6		6	5.198045535	1
			2009				8		8	6.595490333	3
			2010			3	11		14	11.30454443	3
			2011			1	3		4	3.324633875	1
			2012			1	3		4	3.183218074	1
			2013			3	4		7	6.113483725	1

NOTE: *In 2007, the FAA changed the way we counted total runway incursions to align with our international partners. At that point, we started including – under Category "D" – runway incursion events that did not involve another vehicle/aircraft. Prior to late 2007, those events were not included in this data set.*

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				SEVERITY							
Airport, City	**Code**	**Region**	**Fiscal Year**	**A**	**B**	**C**	**D**	**E**	**Total RIs**	**Annual RI Rate**	**Other Events, Non-RIs**
			2014				6		6	4.774561138	2
Juneau Intl, AK	JNU	AAL	2004						0	0	1
			2005				1		1	0.972072361	0
			2007			1	1		2	2.112557039	4
			2008				1		1	1.122989848	0
			2009			2			2	2.36504464	1
			2010				1		1	1.114504157	1
			2011			1			1	1.030205629	0
			2012				4		4	4.622620795	0
			2013				5		5	5.363310664	1
			2014			2	2		4	4.063512704	2
Kenai Muni, AK	ENA	AAL	2013				1		1	2.385951517	1
			2014				1		1	2.548290097	0
King Salmon Airport, AK	AKN	AAL	2007				1		1	2.908160298	0
			2008				2		2	5.69265363	0
			2010			1			1	3.393626769	0
Kodiak, AK	ADQ	AAL	2004				2		2	6.066856762	2
			2005						0	0	2
			2011				1		1	2.684635829	0
			2014				1		1	2.955868878	0
Lake Hood SPB, Anchorage, AK	LHD	AAL	2004			1	1		2	N/A	3
			2005			1	2		3	N/A	1
			2006						0	N/A	9
			2007	1			2		3	N/A	4
			2008				1		1	N/A	0
			2009			4	1		5	N/A	2
			2010			1	6		7	N/A	0
			2011			2	4		6	N/A	0

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Airport, City	**Code**	**Region**	**Fiscal Year**	**A**	**B**	**C**	**D**	**E**	**Total RIs**	**Annual RI Rate**	**Other Events, Non-RIs**
			2012			3	3		6	N/A	0
			2013			1	1		2	N/A	0
			2014			1	4		5	N/A	1
Merrill Field, Anchorage, AK	MRI	AAL	2004			1	4		5	2.577638471	22
			2005			1	1		2	1.064163754	9
			2006						0	0	10
			2007						0	0	9
			2008			1	11		12	6.932328916	1
			2009			1	12		13	7.705667222	3
			2010			3	6		9	6.224927376	4
			2011			1	11		12	8.778924728	3
			2012			1	3		4	3.32416418	3
			2013	1		9	7		17	12.73875805	5
			2014			11	10		21	17.29491118	20
Ted Stevens Anchorage Intl, AK	ANC	AAL	2004			2	2		4	1.305206141	4
			2005			1	3		4	1.275046699	8
			2006				3		3	0.984872361	5
			2007				1		1	0.332805282	3
			2008			3	6		9	3.10135219	1
			2009			3	3		6	2.343740845	4
			2010			4	2		6	2.205590437	2
			2011			2	1		3	1.086440856	0
			2012			3	2		5	1.841390029	1
			2013			3	4		7	2.642546509	0
			2014			6	5		11	4.038475659	2
ARIZONA											
Chandler Muni, AZ	CHD	AWP	2004						0	0	1
			2005				1		1	0.440237728	1

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			2006			1			1	0.37300489	0
			2007						0	0	1
			2008			2			2	0.786546902	2
			2009			1	2		3	1.45793139	0
			2010			1			1	0.556764973	0
			2011			1	3		4	2.517369852	0
			2012			2	3		5	2.631855985	0
			2013	1			1		2	0.979652615	0
			2004						0	0	1
			2005				4		4	1.693265038	4
			2006				1		1	0.439481236	3
			2007				4		4	1.729318432	1
			2008			4	3		7	2.740884601	1
Ernest A. Love Field, Prescott, AZ	PRC	AWP	2009			9	6		15	5.882306805	1
			2010			5	5		10	4.376156946	1
			2011			2	3		5	2.007024586	1
			2012			6	1		7	2.861054912	2
			2013			6	5		11	4.274002409	2
			2014			3	3		6	2.167097678	5
			2004						0	0	2
			2005				2		2	0.77812534	4
			2006						0	0	2
			2007				6		6	2.095498868	2
Falcon Field, Mesa, AZ	FFZ	AWP	2008	1	1	7	5		14	4.262211235	0
			2009				2		2	0.719797305	2
			2010			1	1		2	0.886721348	0
			2011			4	3		7	3.291314222	0
			2012			3	7		10	5.396974456	2

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			2013			12	4		16	6.580435543	2
			2014			8	9		17	6.658858828	4
Flagstaff Pulliam Airport, AZ	FLG	AWP	2006						0	0	1
			2010				1		1	3.094442381	0
Glendale Muni, AZ	GEU	AWP	2004						0	0	1
			2005		1				1	0.775891499	0
			2007						0	0	1
			2008			1			1	0.713516136	0
			2009				1		1	0.865373798	1
			2010				4		4	4.897759275	1
			2011				1		1	1.073364461	0
			2013				1		1	1.400874145	0
Grand Canyon National Park Airport, AZ	GCN	AWP	2009				1		1	1.083881597	0
			2010			1	1		2	2.071959141	0
			2012			1	1		2	1.95118144	0
			2014				2		2	1.954747593	0
Laughlin/Bullhead Intl, Bullhead City, AZ	IFP	AWP	2004						0	0	7
			2005				1		1	3.522863383	7
			2006						0	0	2
			2008		1				1	4.52837024	0
			2009				1		1	4.734176017	0
			2010				2		2	9.602458229	1
			2011				1		1	4.413646997	0
			2013						0	0	1
			2014				1		1	7.377351531	0
Phoenix Deer Valley Airport, AZ	DVT	AWP	2004			1	1		2	0.559144956	1
			2005	1		3	1		5	1.395817572	8
			2006	1			1		2	0.501971493	2

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Runway Incursion Data for 2004 through 2014 by Airport (Sorted by State)

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Airport, City	**Code**	**Region**	**Fiscal Year**	**A**	**B**	**C**	**D**	**E**	**Total RIs**	**Annual RI Rate**	**Other Events, Non-RIs**
			2007				1		1	0.252181369	3
			2008			1	1		2	0.545430249	0
			2009	1		8	8		17	4.156052435	6
			2010			6	2		8	2.167581115	1
			2011			8	12		20	6.035421891	7
			2012		1	8	10		19	5.296447756	9
			2013			7	5		12	3.367475796	6
			2014			8	3		11	3.263794725	5
Phoenix Goodyear Airport, Goodyear, AZ	GYR	AWP	2005				1		1	1.039382191	0
			2006				1		1	0.716681478	1
			2009			1			1	0.555580248	0
			2010			3			3	1.965550452	0
			2011			1	2		3	2.115357495	0
			2012			2	2		4	2.795756042	0
			2013			5	1		6	4.466512324	1
			2014				1		1	1.234705091	0
Phoenix-Mesa Gateway Airport, Phoenix, AZ	IWA	AWP	2004			1			1	0.432636356	2
			2005			1	1		2	0.766213069	1
			2006			1	4		5	1.818208265	2
			2007				1		1	0.333788398	0
			2008				5		5	1.957276567	0
			2009			2	4		6	3.184459836	1
			2010				6		6	3.374008885	0
			2011			3	5		8	4.497034768	1
			2012			3	11		14	8.440955516	7
			2013			2	5		7	4.107450916	1
			2014			2	4		6	2.664523206	3
Phoenix Sky Harbor Intl, AZ	PHX	AWP	2004			4	1		5	0.837960271	7

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				A	B	C	D	E			
			2005			2	2		4	0.714429876	2
			2006	2		1			3	0.543755064	1
			2007				1		1	0.184795062	0
			2008			2	3		5	0.959486636	2
			2009			1	6		7	1.520777074	2
			2010		1	1			2	0.445295454	3
			2011			2	2		4	0.866340922	1
			2012			4	2		6	1.320204632	2
			2013			4	3		7	1.600384092	3
			2014			3	3		6	1.393822116	18
Ryan Field, Tucson, AZ	RYN	AWP	2004				1		1	0.651177329	0
			2010				2		2	1.647337902	0
			2011			2	2		4	3.598675687	0
			2012				1		1	0.846116747	0
			2013						0	0	1
			2014				1		1	0.848550675	0
Scottsdale Airport, AZ	SDL	AWP	2004				1		1	0.496307472	1
			2005	1		2	2		5	2.356789675	1
			2006				1		1	0.49634196	2
			2007				1		1	0.530515236	0
			2011			2	5		7	4.964891127	0
			2012			2	2		4	2.744594863	8
			2014			3	1		4	2.667876104	1
Tucson Intl, AZ	TUS	AWP	2004			1			1	0.408359945	2
			2005						0	0	4
			2006	1		1	2		4	1.421575248	1
			2007				2		2	0.776617597	1
			2008			2			2	0.864326646	1

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			2009			9	22		31	17.09034175	2
			2010			2	3		5	2.965722183	0
			2011			4	7		11	6.945759929	2
			2012			2	6		8	5.490960506	1
			2013				11		11	7.928899397	2
			2014			3	4		7	5.0177413	3
ARKANSAS											
			2004			1	1		2	1.083670174	2
			2005						0	0	1
			2006				1		1	0.685053503	4
			2007			2	1		3	2.114880298	1
Adams Field, Little Rock, AR	LIT	ASW	2008				1		1	0.763201478	1
			2010			1	1		2	1.717829351	0
			2012			1	2		3	2.742982536	0
			2013			1	1		2	1.940673608	1
			2014				1		1	1.117518216	0
			2005						0	0	1
Drake Field, Fayetteville, AR	FYV	ASW	2013						0	0	1
			2014			1			1	2.681108907	0
			2004						0	0	1
			2007						0	0	1
			2009				1		1	2.213613724	1
Fort Smith Regional, AR	FSM	ASW	2010				1		1	2.196450536	0
			2012			2			2	4.969437957	0
			2014				1		1	2.824220515	0
Northwest Arkansas Regional, Fayetteville/Springdale, AR	XNA	ASW	2011				1		1	2.329264884	0
Rogers Muni-Carter Field, AR	ROG	ASW	2013				1		1	7.686395081	0

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Springdale Muni, AR	ASG	ASW	2004				1		1	1.673332106	0
			2013				1		1	3.792763407	0
Texarkana Regional-Webb Field, AR	TXK	ASW	2008				1		1	3.639010189	0
			2009				1		1	3.50385424	0
			2010				3		3	9.85480586	0
			2011				2		2	7.365126128	0
			2012				1		1	3.951788184	0
CALIFORNIA											
Atwater/Castle Airport, Atwater, CA	MER	AWP	2008	1			4		5	3.757646811	0
			2009				5		5	5.814359141	2
			2011			1	5		6	9.961151509	0
			2012			3	2		5	7.69455687	0
			2013						0	0	1
			2014				1		1	0.969283409	0
Bob Hope Airport, Burbank, CA	BUR	AWP	2004						0	0	1
			2005						0	0	3
			2006				2		2	1.044479144	5
			2007				1		1	0.526468188	4
			2008				1		1	0.814405199	0
			2010			2	1		3	2.683003175	0
			2011			1			1	0.841580825	0
			2012			1			1	0.746937556	0
			2013		1	1	1		3	2.249938127	1
			2014			1			1	0.834884828	0
Brackett Field, La Verne, CA	POC	AWP	2004						0	0	2
			2005			1	1		2	1.165059855	1
			2006				1		1	0.825866127	5
			2007						0	0	7

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			2008			3	3		6	4.960071425	0
			2009			1	1		2	1.893401496	5
			2010			4	4		8	6.883082244	1
			2011			1	1		2	1.886792453	3
			2012				1		1	1.10273036	1
			2013		1	1	4		6	6.041931001	1
			2014			2	4		6	6.472631556	1
Brown Field Muni, San Diego, CA	SDM	AWP	2004						0	0	1
			2005						0	0	1
			2008	1					1	0.839221873	0
			2012			2	3		5	5.512192971	0
			2013						0	0	3
			2014			1	3		4	4.459706551	1
Buchanan Field, Concord, CA	CCR	AWP	2004	1			4		5	4.033103715	1
			2005			1	1		2	1.622073172	2
			2006						0	0	1
			2007				1		1	1.087464793	1
			2008			1	3		4	4.212388635	0
			2009				1		1	1.109004004	1
			2010			1			1	1.24975005	1
			2012				1		1	1.33267588	0
			2013				4		4	4.887764703	0
			2014			3			3	2.942301468	0
Camarillo Airport, CA	CMA	AWP	2004		1		3		4	2.372577746	4
			2005				1		1	0.651287596	7
			2006				2		2	1.334285123	11
			2007						0	0	4
			2008				2		2	1.299730956	4

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			2009			2			2	1.233486697	6
			2010			3	1		4	2.539392323	3
			2011			1	2		3	2.293981358	8
			2012			2	2		4	3.043422024	2
			2013				2		2	1.456399053	4
			2014	1			3		4	2.823761957	2
Charles M. Schulz-Sonoma CO Airport, Santa Rosa, CA	STS	AWP	2004						0	0	1
			2005						0	0	2
			2006						0	0	1
			2007						0	0	1
			2008				1		1	0.93321015	0
			2009				1		1	1.102219871	0
			2010			2	3		5	6.524519143	0
			2011				3		3	3.971721344	0
			2012				2		2	2.453596359	1
			2013			2	2		4	5.283876252	1
			2014			5	4		9	11.50777414	0
Chico Muni, CA	CIC	AWP	2005						0	0	1
			2006				1		1	2.201479394	0
			2008				1		1	1.778188737	0
			2010			1	2		3	6.685981725	0
			2011				1		1	2.104554255	0
			2012				1		1	1.80238636	0
			2013			1	1		2	4.245743642	0
			2014				1		1	2.000520135	0
Chino Airport, CA	CNO	AWP	2004				3		3	1.895890342	4
			2005						0	0	2
			2006						0	0	10

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			2007						0	0	6
			2008				2		2	1.435946037	0
			2009			1	3		4	2.517100552	2
			2010		1	1	3		5	2.78348392	1
			2011			2	3		5	2.93868723	2
			2012			7	9		16	9.868867424	7
			2013			5	6		11	6.509992839	5
			2014			2	8		10	5.725769973	8
			2005						0	0	2
			2006						0	0	1
			2007						0	0	1
			2008			1			1	1.16335885	1
			2009						0	0	1
El Monte Airport, CA	EMT	AWP	2010				4		4	4.52417038	4
			2011						0	0	1
			2012				1		1	1.223990208	3
			2013			1	1		2	2.28448719	0
			2014			1			1	1.069816206	0
			2004				1		1	0.609863939	2
			2006				1		1	0.647848818	0
			2007		1				1	0.638373934	0
			2008	1			1		2	1.245500629	0
			2009			1	4		5	3.847722533	0
Fresno Yosemite Intl, CA	FAT	AWP	2010				1		1	0.84190675	0
			2011				2		2	1.581740389	0
			2012				1		1	0.829607015	1
			2013			1			1	0.786992587	0
			2014			5	8		13	10.4916551	1

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Fullerton Muni, CA	FUL	AWP	2008			1	1		2	2.85477747	0
General WM J Fox Airfield Airport, Lancaster, CA	WJF	AWP	2009			1			1	1.691503578	0
Gillespie Field, San Diego/El Cajon, CA	SEE	AWP	2004		1		1		2	1.008166146	6
			2005		1	1	2		4	1.750301927	1
			2006	1					1	0.360782899	3
			2007						0	0	1
			2008				1		1	0.390941113	1
			2009				2		2	0.906573108	0
			2010				1		1	0.459039872	0
			2011				3		3	1.336243374	0
			2012			1			1	0.515671249	1
			2013			1	3		4	2.047355329	0
			2014			1	2		3	1.496498194	0
Hayward Executive Airport, CA	HWD	AWP	2006						0	0	1
			2007						0	0	1
			2009			2	3		5	4.104180518	0
			2010			1	1		2	2.314091661	0
			2011				1		1	1.143144562	0
			2012			2	3		5	5.651122313	1
			2013			1			1	1.071099591	0
			2014			2	1		3	2.692659809	4
Jack Northrop Field/Hawthorne Muni, CA	HHR	AWP	2006				1		1	1.609968928	3
			2007				1		1	1.453741932	0
			2008			1	1		2	3.456559686	0
			2009				3		3	5.968130185	0
John Wayne Airport-Orange CO, Santa Ana, CA	SNA	AWP	2004			2	2		4	1.09542523	4
			2005			3	5		8	2.125550983	3

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			2006				3		3	0.828628564	1
			2007				9		9	2.575018883	12
			2008			8	2		10	3.039938715	5
			2009			2	5		7	2.428582332	4
			2010			4	7		11	3.836923764	3
			2011			2	3		5	1.886372468	5
			2012			1	2		3	1.15157401	2
			2013			2	1		3	1.147587389	4
			2014			7	1		8	2.914846406	0
Lake Tahoe Airport, South Lake Tahoe, CA	TVL	AWP	2004						0	0	1
			2006						0	0	1
			2008			1	1		2	1.19598627	0
			2009			2	1		3	2.149951984	0
			2010	1		4	4		9	7.078532384	0
Livermore Muni, CA	LVK	AWP	2011			3	6		9	6.851557207	1
			2012	1		1	4		6	4.443621552	2
			2013			1	9		10	6.686145638	1
			2014			1	1		2	1.258772068	0
			2004			1	4		5	1.453517949	8
			2005				6		6	1.713781373	10
			2006			1	1		2	0.556687487	6
			2007		1		5		6	1.506772944	9
Long Beach/Daugherty Field, CA	LGB	AWP	2008			6	5		11	3.040572291	0
			2009			5	6		11	3.619814205	1
			2010			2	3		5	1.622249476	5
			2011				2		2	0.694526437	1
			2012			2	5		7	2.575697922	1

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			2013			1	6		7	2.608271201	0
			2014			6	4		10	3.279086315	0
Los Angeles Intl, CA	LAX	AWP	2004		1	2	4		7	1.082052003	4
			2005			2	6		8	1.224113818	12
			2006	1	1		6		8	1.224775369	3
			2007		2	2	4		8	1.190042321	13
			2008			3	6		9	1.36524777	1
			2009			3	5		8	1.468930288	0
			2010			8	4		12	2.101638753	4
			2011			13	6		19	3.186882122	0
			2012			12	7		19	3.120657769	3
			2013		1	16	11		28	4.617810234	3
			2014			12	9		21	3.315613223	11
McClellan-Palomar Airport, Carlsbad, CA	CRQ	AWP	2004			1			1	0.477349754	1
			2005				1		1	0.487362686	0
			2006				3		3	1.517159069	0
			2007				2		2	0.926530745	0
			2008			1	2		3	1.551935522	2
			2009			2	2		4	2.286995003	1
			2010			2	1		3	2.168241051	0
			2012			1	2		3	2.104465676	0
			2013			3	4		7	4.708319601	2
			2014			2	2		4	2.691627021	2
Meadows Field, Bakersfield, CA	BFL	AWP	2004			1			1	0.711536135	4
			2005						0	0	1
			2006						0	0	2
			2007						0	0	2
			2008				1		1	0.791295747	0

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			2009				2		2	1.614100784	1
			2012				1		1	0.906897865	1
			2013			2	1		3	3.162788736	1
			2014				1		1	1.561109637	0
Metropolitan Oakland Intl, CA	OAK	AWP	2004						0	0	2
			2005						0	0	3
			2006			1	1		2	0.59948624	5
			2007				1		1	0.286476313	1
			2008			1			1	0.337155553	0
			2009			2			2	0.836295212	0
			2010			1			1	0.443081722	0
			2011			1	1		2	0.942169628	0
			2013			1			1	0.494000366	0
			2014				3		3	1.482608996	3
Modesto City-CO-Harry Sham Field, CA	MOD	AWP	2004				1		1	1.244524094	1
			2010				1		1	2.281542323	0
			2011				1		1	2.241850872	0
			2013				2		2	4.694945891	0
			2014				1		1	2.121205693	0
Monterey Peninsula Airport, CA	MRY	AWP	2005				1		1	1.120448179	1
			2006				2		2	2.170468604	2
			2007						0	0	1
			2008			2	1		3	3.72199201	2
			2009			1	3		4	5.881488016	6
			2010			1	4		5	8.721741557	1
			2011			1	2		3	5.643234702	4
			2012			1	2		3	5.307855626	0
			2013				4		4	7.31635938	1

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			2014			3	1		4	7.876496534	1
Montgomery Field, San Diego, CA	MYF	AWP	2004				2		2	0.893734918	1
			2005				1		1	0.412856347	1
			2006						0	0	2
			2007	1		1	1		3	1.342822613	2
			2008			1	3		4	1.681315125	0
			2009				1		1	0.488355171	0
			2010			1	1		2	1.009484103	4
			2011				4		4	2.036535446	1
			2012			1	10		11	5.768252587	4
			2013				3		3	1.692257358	9
			2014	1	1	3	13		18	8.636863091	0
Napa County Airport, CA	APC	AWP	2004			1	1		2	1.71877417	0
			2006			1	2		3	2.577319588	3
			2007	1			1		2	1.631015389	5
			2008			2	5		7	5.800944725	0
			2009				2		2	1.913948859	0
			2010			1	1		2	2.653610901	0
			2011			1	3		4	7.413035823	0
			2012				1		1	2.08394115	0
			2013				1		1	2.337322364	0
			2014			2			2	4.492060283	0
Norman Y. Mineta San Jose Intl, CA	SJC	AWP	2004		1	1			2	0.917477487	3
			2005						0	0	8
			2006				2		2	0.931315483	8
			2007				4		4	1.928156875	7
			2008				8		8	4.052233287	0
			2009			2	8		10	5.917825081	0

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			2010			2	2		4	2.877283844	1
			2011				5		5	3.628078425	1
			2012			1	2		3	2.21273206	1
			2013			3	3		6	4.397182872	0
			2014				4		4	2.833021701	4
Ontario Intl, CA	ONT	AWP	2004			1			1	0.652077519	6
			2005				1		1	0.683802764	3
			2006				1		1	0.733084085	2
			2007				1		1	0.689574326	3
			2008				2		2	1.475154707	0
			2009				4		4	3.976854706	2
			2010				2		2	2.088925561	1
			2011			2	1		3	3.27482316	0
			2013			1			1	1.222165188	1
			2014			1	1		2	2.393919445	0
Oxnard Airport, CA	OXR	AWP	2004			2			2	2.083854297	3
			2005						0	0	2
			2006						0	0	1
			2007						0	0	2
			2008			2	3		5	5.587216449	1
			2009			2	1		3	4.842224195	0
			2010				1		1	1.731811648	0
			2012			1	1		2	3.615394349	0
			2013				1		1	1.807860578	0
Palmdale Regional/USAF Plant 42, CA	PMD	AWP	2004						0	0	1
			2007						0	0	1
			2010				2		2	7.919223916	0
Palm Springs Intl, CA	PSP	AWP	2004				3		3	3.157562362	1

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			2005				2		2	2.111887817	2
			2006		1		2		3	3.268294277	5
			2007				2		2	2.213540226	9
			2008				3		3	3.945032547	1
			2009				3		3	4.026251158	0
			2010			2			2	2.976722034	0
			2011				1		1	1.686710409	0
			2012				5		5	8.696862172	0
			2013				3		3	5.427801198	0
			2014			1	1		2	3.532882302	1
Palo Alto Airport of Santa Clara CO, CA	PAO	AWP	2005				1		1	0.541064057	1
			2008			3	2		5	2.858531287	0
			2010			1	2		3	1.896129999	0
			2011			1	3		4	2.347569385	2
			2012			2	1		3	1.699100609	2
			2013			1			1	0.579196423	0
			2014			2	4		6	3.335186215	4
Ramona Airport, CA	RNM	AWP	2007						0	0	1
			2010			1			1	0.969039198	0
			2014			1			1	0.859320621	0
Redding Muni, CA	RDD	AWP	2004		1				1	1.276487107	0
			2007						0	0	1
			2008				1		1	1.4537842	0
			2010				2		2	2.318706162	0
			2011			1			1	1.054930216	0
			2013						0	0	1
			2014				1		1	0.90722697	0
Reid-Hillview of Santa Clara CO Airport,	RHV	AWP	2004			1			1	0.487754913	0

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San Jose, CA			2005				1		1	0.498785457	1
			2006				1		1	0.593718459	0
			2007						0	0	1
			2008						0	0	1
			2009				1		1	0.780609656	0
			2010			2	2		4	3.514166484	1
			2011			1	1		2	1.691317621	1
			2012			3	1		4	2.880391733	4
			2013		1	9	4		14	9.744824802	7
			2014			5	10		15	11.10921843	3
Riverside Muni, CA	RAL	AWP	2005						0	0	1
			2006		1				1	1.196716211	0
			2007						0	0	2
			2008			3			3	4.026035027	0
			2011				2		2	3.272733223	0
			2012			2			2	2.836356417	2
			2013						0	0	2
			2014				1		1	0.916783557	1
Sacramento Executive Airport, CA	SAC	AWP	2004			1			1	0.738312513	0
			2006				1		1	0.882230986	2
			2009				1		1	1.092144207	0
			2010			1			1	1.104374427	0
			2012			1			1	1.074794983	0
Sacramento Intl, CA	SMF	AWP	2004				1		1	0.606777707	1
			2006						0	0	1
			2007						0	0	1
			2009			1			1	0.755383999	0
			2011			1			1	0.860518548	0

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			2013				1		1	0.914929825	0
			2014				1		1	0.919489499	0
Sacramento Mather Airport, CA	MHR	AWP	2004			1			1	1.241110546	1
			2005						0	0	1
			2006						0	0	1
			2010			2			2	2.650867496	1
			2011				1		1	1.40394227	0
			2012		1		1		2	2.500218769	0
			2013				1		1	1.345098461	1
			2014				2		2	2.059414097	0
Salinas Muni, CA	SNS	AWP	2004			1			1	1.277612398	0
			2006			1			1	1.355509468	0
			2008				2		2	2.486788934	0
			2009			1			1	1.322996322	1
			2010			1	2		3	5.693139767	0
			2011				1		1	1.852606618	0
			2012			1	1		2	3.547734771	0
			2013						0	0	1
San Bernardino Intl, CA	SBD	AWP	2010						0	N/A	1
			2011				1		1	N/A	0
			2014				2		2	N/A	0
San Carlos Airport, CA	SQL	AWP	2007						0	0	2
			2008			1	1		2	1.373928336	1
			2009			1			1	0.923403666	0
			2010			2	1		3	2.729431459	0
			2011			1	1		2	1.852967064	0
			2012			2	3		5	4.87025637	4
			2013			3	4		7	6.486706884	5

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			2014			1	5		6	5.000916835	5
San Diego Intl, CA	SAN	AWP	2004				1		1	0.471533521	2
			2005						0	0	4
			2007						0	0	3
			2008		1	1	1		3	1.257513644	0
			2009				1		1	0.492283457	0
			2011			1			1	0.54100844	0
			2012			2			2	1.066797527	0
			2013			2	2		4	2.125082347	1
			2014			1	1		2	1.057115976	0
San Francisco Intl, CA	SFO	AWP	2004			2	1		3	0.850781443	3
			2006			2	1		3	0.838089491	5
			2007	1		1	2		4	1.0773221	4
			2008			11	9		20	5.079829521	0
			2009			3	5		8	2.115254954	0
			2010			7	5		12	3.108292926	0
			2011			4	9		13	3.263281556	1
			2012			2	5		7	1.655922881	1
			2013			8	1		9	2.157145665	1
			2014			5	7		12	2.778613935	1
San Luis CO Regional, San Luis Obispo, CA	SBP	AWP	2006						0	0	1
			2009				1		1	1.155895646	0
			2010						0	0	1
			2011						0	0	1
			2012			1	4		5	6.265821199	2
			2014						0	0	3
Santa Barbara Muni, CA	SBA	AWP	2004			2	1		3	2.004356134	4
			2005				1		1	0.637474581	2

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				A	B	C	D	E			
			2006				2		2	1.461817331	2
			2007			1	1		2	1.616396728	0
			2008			1	3		4	3.382234812	0
			2009			1	4		5	4.691443745	0
			2010			2			2	1.785044894	0
			2011				2		2	1.88393101	1
			2012			3	3		6	5.780959447	0
			2013				1		1	0.961159543	1
			2014				4		4	3.809922944	1
Santa Maria Pub/Capt G Allan Hancock Field, CA	SMX	AWP	2006				2		2	3.118762475	0
			2008						0	0	1
			2009			1	1		2	3.505266663	0
			2011				1		1	2.084158313	1
			2013				1		1	2.197850502	1
			2014				1		1	2.325851843	0
Santa Monica Muni, CA	SMO	AWP	2004				1		1	0.735802687	2
			2005						0	0	3
			2006						0	0	6
			2009			1			1	0.867355347	0
			2010				1		1	0.920945996	0
			2011				1		1	0.9306048	0
			2012			1	3		4	3.745949692	0
			2013			2	5		7	7.16611044	1
			2014			3	4		7	8.276481786	0
Southern California Logistics Airport, Victorville, CA	VCV	AWP	2006						0	0	3
			2007						0	0	1
			2011				1		1	2.386691806	0
			2013				2		2	3.985254558	0

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Runway Incursion Data for 2004 through 2014 by Airport (Sorted by State)

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Airport, City	**Code**	**Region**	**Fiscal Year**	**A**	**B**	**C**	**D**	**E**	**Total RIs**	**Annual RI Rate**	**Other Events, Non-RIs**
Stockton Metro, CA	SCK	AWP	2009				1		1	1.64095832	1
			2010				3		3	5.429176394	5
			2011				1		1	2.278734846	0
			2012			1	1		2	3.582046782	0
			2013			1			1	1.95802005	0
Vandenberg AFB, Lompoc, CA	VBG	AWP	2004						0	0	1
Van Nuys Airport, CA	VNY	AWP	2004				1		1	0.220509111	5
			2005		1		2		3	0.712616156	6
			2006			1	1		2	0.506017817	1
			2007						0	0	4
			2008			3	3		6	1.5361927	0
			2010				1		1	0.308320332	0
			2011			1	1		2	0.661314429	0
			2012			1	3		4	1.514319786	0
			2013			8	9		17	6.502970327	4
			2014			10	10		20	8.112504208	3
Whiteman Airport, Los Angeles, CA	WHP	AWP	2004						0	0	1
			2006						0	0	1
			2008			1			1	1.092681221	0
			2010				1		1	1.170425684	0
			2011			1	1		2	2.538264335	1
			2014						0	0	1
Yuba CO Airport, Marysville, CA	MYV	AWP	2006						0	N/A	1
Zamperini Field, Torrance, CA	TOA	AWP	2005						0	0	1
			2006				1		1	0.673650173	0
			2007	1			2		3	1.783930355	5
			2008				2		2	1.265742675	1
			2009				1		1	0.734025764	3

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			2010				2		2	1.834256576	1
			2011			1	1		2	1.653493832	0
			2013				1		1	0.815520996	0
			2014			1			1	0.784818471	0
COLORADO											
			2004			2	2		4	1.132964742	5
			2005			2			2	0.560175447	6
			2006			1			1	0.310748157	4
			2007				3		3	0.909203871	5
			2008			3	2		5	1.504447146	0
Centennial Airport, Denver, CO	APA	ANM	2009	1		2	6		9	3.324271615	2
			2010			4	4		8	2.858582358	0
			2011			5	8		13	4.487726069	0
			2012	1		2	6		9	3.026634383	0
			2013			2	6		8	2.734397698	0
			2014			2	4		6	1.92467465	2
			2004	1					1	0.553381994	0
			2006				1		1	0.674590861	0
			2007				1		1	0.662791545	1
			2008				1		1	0.669994305	0
			2009			1	1		2	1.372485778	0
City of Colorado Springs Muni, CO	COS	ANM	2010				1		1	0.691529456	0
			2011			1	1		2	1.585514737	2
			2012			2			2	1.534895857	1
			2013			1	4		5	3.674687284	1
			2014			1			1	0.787798576	1
			2004			1			1	0.178643205	1
Denver Intl, CO	DEN	ANM	2005						0	0	1

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			2006						0	0	1
			2007	2			2		4	0.653625744	4
			2008			3	1		4	0.634143557	0
			2009			1	2		3	0.490398809	1
			2010						0	0	3
			2011			3			3	0.467345772	3
			2012			2	2		4	0.646851451	0
			2013			14			14	2.359118499	3
			2014			7	1		8	1.381811901	2
Eagle CO Regional, CO	EGE	ANM	2005	1					1	2.436647173	1
			2008			1			1	2.328397131	1
			2009			1			1	3.194684046	0
			2010			1	4		5	14.26085964	1
			2012				1		1	2.734182753	0
			2013						0	0	1
Front Range Airport, Denver, CO	FTG	ANM	2006	1					1	1.125023907	0
			2008			1			1	1.2963107	0
			2009		1		4		5	6.877389893	1
			2011						0	0	1
			2012				1		1	1.940730103	0
			2013				1		1	2.264338926	1
			2014			1	1		2	4.300150505	0
Pueblo Memorial Airport, CO	PUB	ANM	2004			1			1	1.093876479	0
			2005						0	0	2
			2006						0	0	1
			2007				1		1	0.689132382	3
			2008			3	8		11	6.769355742	0
			2009			1	1		2	1.298768767	0

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			2010			1	1		2	1.09811673	1
			2011			1	1		2	1.238819653	0
			2012			1	1		2	1.234293614	0
			2013			2			2	1.344772868	0
			2014			3	1		4	2.852558388	0
Rocky Mountain Metro, Denver, CO	BJC	ANM	2004		1	2	1		4	2.143599747	8
			2005						0	0	3
			2006						0	0	1
			2007				4		4	2.381405982	2
			2008			1	2		3	1.948722612	1
			2009			1	2		3	2.437835202	3
			2010			1	3		4	3.451370194	1
			2011			1	2		3	2.399002015	0
			2012				3		3	2.509956159	0
			2013			2	4		6	5.326799126	2
			2014			4	4		8	6.911566507	0
Sardy Field, Aspen, CO	ASE	ANM	2005			1	1		2	4.465980394	2
			2006				1		1	2.249010435	1
			2007						0	0	1
			2008				2		2	4.317230065	3
			2009						0	0	4
			2010				1		1	2.611511543	7
			2011				4		4	10.77557178	8
			2012			2	1		3	7.953762129	7
			2013			1	5		6	16.92858957	3
			2014				1		1	2.855592678	0
Walker Field, Grand Junction, CO	GJT	ANM	2004				1		1	1.136945029	0
			2006				1		1	1.351734952	0

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			2007						0	0	1
			2008			1	1		2	2.792945021	0
			2009				2		2	3.397085301	0
			2011				1		1	1.958480219	0
			2013						0	0	1
CONNECTICUT											
			2004						0	0	2
			2005			1	2		3	1.912801744	3
			2006				2		2	1.33122999	1
			2007				1		1	0.694603624	1
			2008			1	3		4	3.085467448	0
Bradley Intl, Windsor Locks, CT	BDL	ANE	2009			1			1	0.92802257	0
			2010			1	1		2	1.950420316	0
			2011				2		2	1.848360504	0
			2012				1		1	0.99023627	0
			2013			2	1		3	3.152452608	0
			2014				3		3	3.103662322	0
			2007						0	0	1
			2008			1	1		2	2.417999589	0
Danbury Muni, CT	DXR	ANE	2010				1		1	1.316603689	0
			2013				1		1	1.551614455	0
			2014			1			1	1.470436867	0
			2004				1		1	1.023405279	0
			2006						0	0	1
Hartford-Brainard Airport, Hartford, CT	HFD	ANE	2011				2		2	3.086134	0
			2013			1			1	1.740129118	0
			2007			1	2		3	3.503035965	2
Igor I. Sikorsky Memorial, Bridgeport, CT	BDR	ANE	2010			2			2	2.836879433	0

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			2013				1		1	1.625461225	0
Tweed-New Haven Airport, New Haven, CT	HVN	ANE	2005						0	0	1
			2007						0	0	1
			2013				1		1	3.069744597	1
Waterbury-Oxford Airport, Oxford, CT	OXC	ANE	2004						0	0	1
			2005						0	0	1
			2006						0	0	1
			2007						0	0	3
			2008				1		1	1.905451497	1
			2009						0	0	2
			2010				1		1	2.2068722	0
			2011				1		1	2.076972605	1
			2012				1		1	2.062110777	0
DELAWARE											
New Castle Airport, Wilmington, DE	ILG	AEA	2004			1			1	0.845909183	0
			2007						0	0	1
			2008						0	0	1
			2009				1		1	1.736593498	0
			2010				2		2	3.007111819	0
			2012			1	7		8	14.30026992	0
			2013			1	4		5	9.359790341	0
			2014			1	2		3	4.97883993	0
DISTRICT OF COLUMBIA											
Ronald Reagan Washington National Airport, Wash, DC	DCA	AEA	2006			1	1		2	0.719797305	3
			2007				1		1	0.35722068	2
			2008			3	2		5	1.793638324	0
			2009			1			1	0.362828904	0
			2010			1	5		6	2.220084363	0

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			2011			4	2		6	2.10674897	0
			2012			10	1		11	3.821222374	0
			2013			7	3		10	3.384827848	0
			2014			12	3		15	5.22708186	0
Washington Dulles Intl, Washington, DC	IAD	AEA	2004			1	2		3	0.68398985	1
			2005				2		2	0.339724687	1
			2006						0	0	2
			2007				4		4	0.93352813	0
			2008		1		4		5	1.243162606	2
			2009			7	2		9	2.43909049	1
			2010			1	2		3	0.819378856	0
			2011				4		4	1.086566775	0
			2012			4	2		6	1.740780392	1
			2013		1	1	1		3	0.89954483	0
			2014			3	4		7	2.192721418	1
FLORIDA											
Boca Raton Airport, FL	BCT	ASO	2013				1		1	2.082335548	1
			2014						0	0	1
Cecil Field, Jacksonville, FL	VQQ	ASO	2005						0	0	1
			2010			1	1		2	2.501500901	0
			2012				1		1	1.109730114	0
Craig Muni, Jacksonville, FL	CRG	ASO	2004						0	0	1
			2009				1		1	0.874072391	0
Daytona Beach Intl, FL	DAB	ASO	2004		1				1	0.32141009	3
			2005						0	0	1
			2006	1			1		2	0.778285825	1
			2007	1		1	3		5	1.646952644	2
			2008	1		2	5		8	2.38762494	2

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			2009			6	1		7	2.107773469	1
			2010			1	2		3	1.091679221	1
			2011			7	4		11	5.021294855	0
			2012			5	3		8	2.845496646	0
			2013			8	4		12	4.164150826	1
			2014			6	9		15	5.180702918	3
Executive Airport, Orlando, FL	ORL	ASO	2004			1			1	0.62851181	0
			2005			1			1	0.642071064	2
			2006	1			1		2	1.21887303	3
			2007				2		2	1.318096142	0
			2008			2	3		5	3.55813639	0
			2009			4	2		6	5.301992666	0
			2010			1			1	0.980161531	0
			2011			7			7	6.4011705	1
			2012			2	2		4	3.687111701	0
			2013			1	2		3	2.822865208	0
			2014				2		2	1.82185866	0
Flagler CO Airport, Palm Coast, FL	XFL	ASO	2010				1		1	0.682421504	0
Fort Lauderdale Executive Airport, FL	FXE	ASO	2004			1	2		3	1.413740616	6
			2005			1	1		2	0.959660664	2
			2006				3		3	1.535587234	18
			2007				4		4	2.00212225	5
			2008			6	6		12	6.417661404	11
			2009			5	2		7	4.56904148	6
			2010			6	6		12	7.815400246	2
			2011			6	8		14	9.400831302	2
			2012			4	2		6	3.799632702	1
			2013			5	7		12	7.545366516	3

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			2014			3	7		10	5.949795625	6
Fort Lauderdale/Hollywood Intl, FL	FLL	ASO	2004				3		3	0.97294247	1
			2005				2		2	0.595041519	7
			2006				2		2	0.665603919	7
			2007	1			3		4	1.313081244	6
			2008			1	2		3	0.984200304	0
			2009			3	7		10	3.759723585	1
			2010			3			3	1.10179887	4
			2011			2	7		9	3.333333333	1
			2012			4	10		14	5.301865499	1
			2013			4	2		6	2.333313889	0
			2014			2			2	0.785289949	1
Gainesville Regional, FL	GNV	ASO	2008						0	0	1
			2012			1			1	1.467243783	0
Jacksonville Intl, FL	JAX	ASO	2004				1		1	0.823167218	1
			2005						0	0	2
			2007						0	0	1
			2009				1		1	1.024327785	0
			2010				1		1	1.052199623	0
			2011						0	0	1
			2012						0	0	1
			2014						0	0	1
Kendall-Tamiami Executive Airport, Miami, FL	TMB	ASO	2004				1		1	0.559628407	3
			2005						0	0	2
			2006			1	1		2	1.017526901	4
			2007		1	1	2		4	1.605548777	4
			2008			3	2		5	1.611816549	1

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			2009			2	1		3	1.292145478	0
			2010			2	2		4	2.043078306	0
			2011			1			1	0.584477448	1
			2012			2			2	0.998701688	0
			2013			3	7		10	4.222509353	6
			2014			7	6		13	5.111007144	5
Key West Intl, FL	EYW	ASO	2012						0	0	1
			2013			1	1		2	3.400666531	0
			2014						0	0	1
Kissimmee Gateway Airport, Orlando, FL	ISM	ASO	2005			1			1	0.662659784	4
			2006				1		1	0.673296392	3
			2007			1	1		2	1.189315192	2
			2009			1			1	0.78579904	0
			2010			1	2		3	2.484369177	0
			2012			2	2		4	3.306823631	1
			2013				1		1	0.906421087	0
			2014			1	1		2	2.333504457	0
Lakeland Linder Regional, FL	LAL	ASO	2007						0	0	2
			2014				1		1	1.02325867	0
Melbourne Intl, FL	MLB	ASO	2009			1			1	0.684790796	0
			2010				3		3	2.174369976	0
			2011			1	3		4	2.124145695	0
			2012			3	5		8	4.410751206	0
			2013			2	5		7	5.38366289	3
			2014				4		4	3.023065994	0
Miami Intl, FL	MIA	ASO	2004			3	3		6	1.509494722	3
			2005			1			1	0.258611103	1
			2006	1		1	2		4	1.041007904	1

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			2007				5		5	1.292878309	3
			2008			3	5		8	2.117651419	0
			2009			4	4		8	2.276432943	0
			2010			8	9		17	4.610394541	0
			2011			10	6		16	4.082174166	0
			2012			3	1		4	1.016533924	0
			2013			7	3		10	2.520936377	0
			2014			10	1		11	2.74436034	0
Naples Muni, FL	APF	ASO	2004						0	0	3
			2011				1		1	1.212591551	0
			2014			3	3		6	6.43121282	0
New Smyrna Beach Muni, FL	EVB	ASO	2010			1			1	0.761127687	0
			2011				1		1	0.740762689	0
			2012			1	1		2	1.448299335	0
			2014				2		2	1.26362344	0
North Perry Airport, Hollywood, FL	HWO	ASO	2004				1		1	0.712276078	1
			2009	2		3	3		8	4.601747514	3
			2011			1	2		3	2.218327824	0
			2012		1				1	0.799539465	1
			2013			2	1		3	2.094928179	0
			2014			1	1		2	1.291922898	1
Northwest Florida-Panama City Intl, FL	ECP	ASO	2012			1	1		2	3.452085059	0
Opa Locka Airport, Miami, FL	OPF	ASO	2005						0	0	1
			2007				2		2	1.729834455	3
			2008			1	2		3	3.062943489	3
			2009			2	1		3	3.363982956	2
			2010			1			1	1.092036867	0
			2011						0	0	1

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			2012				3		3	2.970944166	0
			2013				2		2	1.883664858	0
			2014				7		7	5.309627112	1
Orlando Intl, FL	MCO	ASO	2004						0	0	1
			2005			1			1	0.279687421	2
			2006				1		1	0.278163343	0
			2007			1	2		3	0.828054486	5
			2008				1		1	0.278716899	2
			2009				3		3	0.972513526	0
			2010				1		1	0.321157194	1
			2011			2	2		4	1.254158319	0
			2012						0	0	1
			2013			1	3		4	1.334953076	0
			2014			2	1		3	1.015561792	1
Orlando Sanford Intl, Orlando, FL	SFB	ASO	2004			2	3		5	1.381169685	3
			2005			1	1		2	0.582927227	3
			2006				2		2	0.643235733	3
			2007			1	2		3	0.959591598	10
			2008			5	6		11	4.882985901	0
			2009		1	2	4		7	3.160199544	0
			2010			1	3		4	2.058248431	2
			2011			2	1		3	1.427626476	2
			2012			8	6		14	4.919599685	0
			2013		1	3	6		10	3.471993167	0
			2014			3	4		7	3.394005217	3
Ormond Beach Muni, FL	OMN	ASO	2005						0	0	1
			2012				1		1	0.823750371	0
			2013				1		1	0.801956775	0

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			2014			2			2	1.827368498	0
Page Field, Fort Myers, FL	FMY	ASO	2005						0	0	1
			2006						0	0	1
			2009				1		1	1.343941512	0
			2014				1		1	1.114305453	0
Palm Beach Intl, West Palm Beach, FL	PBI	ASO	2004		1	2	1		4	2.020375487	4
			2005				1		1	0.502815768	11
			2006			2	1		3	1.545507467	12
			2007			1	1		2	1.045205122	16
			2008		1		6		7	3.888953705	6
			2009			1	6		7	4.90759696	2
			2010				1		1	0.712514607	4
			2011			1	2		3	2.075104966	0
			2012			4	2		6	4.385451994	0
			2013			3	4		7	5.200053486	2
			2014			1	5		6	4.348298728	5
Panama City-Bay CO Intl, FL	PFN	ASO	2004						0	0	1
			2008				1		1	1.028351655	0
Pensacola Regional, FL	PNS	ASO	2004						0	0	2
			2006				1		1	0.867543464	1
			2007				1		1	0.920505173	0
			2008			2			2	1.832491914	0
			2009			1	1		2	2.05750733	0
			2010				2		2	1.584534939	0
			2011			1	2		3	2.562941573	0
			2012				1		1	0.949370093	0
			2013			4	1		5	4.877287448	0
			2014			2	1		3	2.838409355	0

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Punta Gorda, FL	PGD	ASO	2013				1		1	1.688419133	0
Sarasota/Bradenton Intl, FL	SRQ	ASO	2004						0	0	1
			2006				1		1	0.611060189	0
			2007						0	0	1
			2008				2		2	1.454111865	0
			2010			1	3		4	3.92622621	0
			2011				4		4	3.980416352	1
			2012			5	3		8	7.547881876	1
			2013			4	11		15	15.07916562	1
			2014			3	2		5	4.955941678	0
Southwest Florida Intl, Fort Myers, FL	RSW	ASO	2005						0	0	1
			2006	1					1	1.078993084	1
			2007				2		2	2.140159014	6
			2008				1		1	1.093230715	1
			2009				1		1	1.172181782	0
			2010			1			1	1.201374372	0
			2014						0	0	2
Space Coast Regional, Titusville, FL	TIX	ASO	2004						0	0	1
			2005						0	0	1
			2006						0	0	1
			2007						0	0	1
St Augustine Airport, FL	SGJ	ASO	2004						0	0	3
			2006			1			1	0.872227407	1
			2007				2		2	1.911735186	1
			2008			1	2		3	2.937461446	0
			2010			1			1	1.02085609	0
			2014						0	0	1
St Lucie CO Intl, Fort Pierce, FL	FPR	ASO	2005						0	0	2

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			2006						0	0	1
			2008				2		2	1.319531039	0
			2010			3			3	2.30955772	0
			2012		1				1	0.725552508	0
			2005						0	0	1
			2006						0	0	1
			2007						0	0	5
St Petersburg-Clearwater Intl, FL	PIE	ASO	2008	1	1		1		3	1.768972227	0
			2010			1	2		3	2.269288956	0
			2013			1	2		3	2.115268004	0
			2014			1	2		3	2.336230259	0
			2004						0	0	3
			2005						0	0	3
			2006	1					1	0.98527021	0
			2007						0	0	1
Tallahassee Regional, FL	TLH	ASO	2008				1		1	1.07235156	0
			2010			1			1	1.248860415	0
			2012						0	0	1
			2013				1		1	1.557972143	1
			2004						0	0	2
			2005				1		1	0.371120859	5
			2006		1				1	0.387738168	5
			2007						0	0	1
Tampa Intl, FL	TPA	ASO	2008			2	2		4	1.605974224	1
			2009			1		1	2	0.977259179	0
			2010			2	2		4	2.039089343	0
			2011			1	4		5	2.594827989	1
			2012			1	2		3	1.583138519	1

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			2013			1	4		5	2.685558677	0
			2014				4		4	2.174728567	1
Vero Beach Muni, FL	VRB	ASO	2004						0	0	2
			2005		1	1			2	1.364275092	2
			2007						0	0	2
			2008			2	3		5	2.917799746	1
			2009	1		1			2	1.218138076	1
			2010			3	2		5	3.13294986	0
			2011			2	1		3	1.955658698	0
			2012			1			1	0.668838161	0
			2013			2	1		3	1.615517585	0
			2014			2	3		5	2.367424242	0
Witham Field, Stuart, FL	SUA	ASO	2008				3		3	4.447475317	0
			2009				1		1	1.677796047	0
			2011			1			1	1.788268956	0
			2012				2		2	3.5601125	0
			2013			1			1	1.564896247	0
			2014			1			1	1.253541254	1
GEORGIA											
Athens/Ben Epps Airport, GA	AHN	ASO	2008				1		1	2.1486893	0
Augusta Regional at Bush Field, Augusta, GA	AGS	ASO	2007						0	0	3
			2011				1		1	3.340682836	0
			2013				1		1	3.707823508	1
			2014				1		1	3.798526172	0
Cobb CO-McCollum Field, Atlanta, GA	RYY	ASO	2005						0	0	1
			2008			1			1	1.027358558	0
			2014						0	0	1
Columbus Metro, GA	CSG	ASO	2006						0	0	1

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			2009				1		1	2.971591584	0
			2011			2			2	6.287133382	0
			2012			5			5	19.16443082	0
			2013			2			2	7.618757381	0
DeKalb-Peachtree Airport, Atlanta, GA	PDK	ASO	2004			3	1		4	1.824476261	2
			2005		2	2	4		8	4.04046526	9
			2006			1	3		4	1.938613794	3
			2007			1	6		7	3.133407043	3
			2008	1		1	7		9	4.56532987	0
			2009	1		5	10		16	10.12671046	0
			2010			4	4		8	5.123049239	1
			2011			3	5		8	5.078720163	1
			2012		1	1	1		3	2.052741779	0
			2013			2	3		5	3.449417738	0
			2014			5	8		13	9.423362691	2
Fulton CO Airport-Brown Field, Atlanta, GA	FTY	ASO	2005				1		1	0.849617672	1
			2006						0	0	1
			2007						0	0	2
			2008			2	1		3	2.717637467	0
			2011			1	3		4	6.603602265	0
			2014				2		2	4.15187561	1
Gwinnett CO-Briscoe Field, Lawrenceville, GA	LZU	ASO	2004						0	0	1
			2008						0	0	1
			2010				1		1	1.406766547	0
			2013			1			1	1.416591115	0
Hartsfield-Jackson Atlanta Intl, GA	ATL	ASO	2004	1		2	4		7	0.727059708	4
			2005			1	2		3	0.304757261	1
			2006			2	7		9	0.934191405	3

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			2007			2	9		11	1.111891682	5
			2008			14	8		22	2.227063273	0
			2009			8	7		15	1.542303852	0
			2010			16	2		18	1.881770453	2
			2011			10	4		14	1.505602994	1
			2012			14	5		19	2.039812853	4
			2013			10	6		16	1.750342137	1
			2014			9	5		14	1.597684727	3
Middle Georgia Regional, Macon, GA	MCN	ASO	2004						0	0	1
			2005						0	0	2
			2007						0	0	1
			2010			1			1	5.62239964	0
			2012				1		1	6.706008584	0
Savannah/Hilton Head Intl, Savannah, GA	SAV	ASO	2004						0	0	2
			2005			1	1		2	1.883664858	6
			2007				1		1	0.986426768	4
			2008			2	2		4	4.020100503	1
			2009				2		2	2.210921954	0
			2010			1	5		6	6.04978977	0
			2011				1		1	0.989687457	1
			2012			2	4		6	6.685460238	1
			2013			3	1		4	4.595165885	1
			2014				2		2	2.35413209	0
Southwest Georgia Regional, Albany, GA	ABY	ASO	2009				1		1	3.386386725	0
GUAM											
Guam Intl, Agana, GU	GUM	AWP	2008				2		2	3.382091824	0
			2009				1		1	1.679966401	0
			2011			1			1	1.550579917	0

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			2012						0	0	1
			2013				1		1	1.45885305	0
HAWAII											
Hilo Intl, HI	ITO	AWP	2005						0	0	1
			2006			1			1	1.041666667	2
			2008				1		1	1.194728856	0
			2010			1			1	1.258922614	0
			2014				1		1	1.160173562	0
Honolulu Intl, HI	HNL	AWP	2004			1			1	0.319933454	3
			2005		1		2		3	0.8964322	3
			2006				2		2	0.629655515	4
			2007				2		2	0.639269698	6
			2008		1	1	1		3	1.039465022	1
			2009	1		2	2		5	1.803953545	2
			2010			4	5		9	3.413370552	1
			2011			7	2		9	3.369108272	1
			2012	1	1	13	2		17	6.243274708	0
			2013			7	3		10	3.520209523	5
			2014			17	13		30	9.790451699	12
Kahului Airport, HI	OGG	AWP	2004						0	0	1
			2005			1	1		2	1.19023531	1
			2008				1		1	0.739174785	0
			2009			1			1	0.842041445	0
			2014			2			2	1.575162832	0
Kalaeloa Airport, Kapolei, HI	JRF	AWP	2005						0	0	1
			2006						0	0	2
			2007						0	0	1
			2008			1			1	0.772415498	0

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			2010				1		1	0.859919168	0
			2011				1		1	0.817474331	0
Kona Intl at Keahole Airport, Kailua/Kona, HI	KOA	AWP	2008						0	0	1
			2009				1		1	0.895255148	0
			2010			1			1	0.789683574	0
			2014						0	0	1
Lihue Airport, HI	LIH	AWP	2013				1		1	0.807219774	2
IDAHO											
Boise Air Terminal/Gowen Field, ID	BOI	ANM	2004				1		1	0.597367997	1
			2005			2			2	1.163494206	0
			2006				1		1	0.579911853	1
			2007				2		2	1.080555405	1
			2008			4	1		5	3.194826936	0
			2010			1			1	0.802858175	0
			2011				1		1	0.827951648	0
			2012			1			1	0.869225086	0
			2013			3	2		5	4.450457507	1
			2014		1	2	2		5	3.986859312	1
Friedman Memorial Airport, Hailey, ID	SUN	ANM	2004						0	0	1
			2006	2					2	4.82602191	0
			2008				1		1	2.759458042	0
			2009				1		1	3.41962179	0
			2010				2		2	6.359300477	7
			2011				5		5	17.66534765	1
			2012			1	4		5	18.53980496	3
			2013				1		1	3.379520108	1
			2014						0	0	1
Idaho Falls Regional, ID	IDA	ANM	2006						0	0	3

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			2007						0	0	3
			2008			1	6		7	16.2149641	0
			2009				2		2	4.748450818	1
			2010				1		1	2.624327516	5
			2011				3		3	8.006618805	0
			2012			1	4		5	12.82051282	1
			2013				4		4	11.16227152	0
			2014				2		2	5.933133585	2
Joslin Field- Magic Valley Regional, Twin Falls, ID	TWF	ANM	2005						0	0	1
Lewiston-Nez Perce CO Airport, Lewiston, ID	LWS	ANM	2012			1	1		2	6.467468633	0
			2014				1		1	3.160056881	0
Pocatello Regional, ID	PIH	ANM	2006						0	0	1
			2011						0	0	1
ILLINOIS											
Abraham Lincoln Capital Airport, Springfield, IL	SPI	AGL	2004						0	0	3
			2005						0	0	2
			2006				1		1	1.945903872	1
			2007				2		2	4.372444853	3
			2008			1	6		7	17.61671071	1
			2009				7		7	22.67573696	1
			2010				3		3	9.841873893	0
			2011				1		1	3.305129561	1
			2012			1	3		4	11.30774015	0
			2013				2		2	6.146470389	0
Aurora Muni Airport, Chicago, IL	ARR	AGL	2004						0	0	1
			2007				1		1	1.466060695	0
			2013			4	4		8	12.16489515	1

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Airport, City	**Code**	**Region**	**Fiscal Year**	**A**	**B**	**C**	**D**	**E**	**Total RIs**	**Annual RI Rate**	**Other Events, Non-RIs**
			2014		1	3	2		6	9.784416686	1
Central IL Regional, Bloomington-Normal, IL	BMI	AGL	2008				2		2	5.699304685	0
			2009			1			1	3.497359494	0
			2010				3		3	10.65605797	0
			2011				3		3	10.88099815	0
			2012				3		3	10.55112018	0
			2013				1		1	3.695354939	0
			2014				1		1	3.896812407	0
Chicago Executive Airport, Chicago/Prospect Hgts/Wheeling, IL	PWK	AGL	2004			2	3		5	3.124921877	0
			2005				1		1	0.759589821	0
			2006	1		1			2	1.867797307	0
			2007			1			1	0.843910343	1
			2008			3	1		4	3.940459655	0
			2009						0	0	1
			2010				1		1	1.118680852	0
			2011			2	2		4	4.746140794	1
			2012		1	1	3		5	5.845491957	0
			2013			1	1		2	2.431699636	0
			2014			1			1	1.320515529	0
Chicago Midway Intl, Chicago, IL	MDW	AGL	2004			3	1		4	1.171587824	0
			2005		1	2	1		4	1.326092866	0
			2006				1		1	0.33824579	1
			2007	1					1	0.327541311	3
			2008			2	4		6	2.128036886	0
			2009			4	2		6	2.464632523	0
			2010			3	3		6	2.435321909	0
			2011			2	4		6	2.376134109	0
			2012			8	5		13	5.14778091	1

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Runway Incursion Data for 2004 through 2014 by Airport (Sorted by State)

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Airport, City	**Code**	**Region**	**Fiscal Year**	**A**	**B**	**C**	**D**	**E**	**Total RIs**	**Annual RI Rate**	**Other Events, Non-RIs**
			2013			7	2		9	3.58783008	0
			2014			10	4		14	5.624455131	0
Chicago O'Hare Intl, IL	ORD	AGL	2004			4	3		7	0.707726963	5
			2005	1	1		4		6	0.612012583	7
			2006	2	1	4	2		9	0.9359693	10
			2007	1		1	10		12	1.282933984	4
			2008		1	9	5		15	1.66451759	0
			2009			6	5		11	1.325363481	0
			2010			14			14	1.613447857	0
			2011	3		11	3		17	1.922598448	0
			2012		1	16	12		29	3.298070515	1
			2013			12	5		17	1.937257914	1
			2014	1	1	15	4		21	2.388692612	2
Chicago Rockford Intl, IL	RFD	AGL	2004				1		1	1.343598425	3
			2005				2		2	2.845071625	3
			2006			1	1		2	2.673010612	2
			2007				1		1	1.296663684	3
			2008			1	1		2	3.003995314	1
			2009				1		1	1.954231889	0
			2010			2			2	4.289084281	0
			2011			1	3		4	9.133045642	0
			2012				2		2	4.479383637	4
			2013				1		1	2.425124288	2
Dupage Airport, Chicago (West Chicago), IL	DPA	AGL	2004						0	0	1
			2005			1	1		2	1.342561204	1
			2006			1			1	0.972668028	0
			2007						0	0	1
			2008			1			1	1.009326174	0

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			2009			1			1	1.139938899	1
			2011				1		1	1.179147948	0
			2012			1	5		6	7.394717707	0
			2014			4	1		5	6.870302431	1
Greater Peoria Regional, IL	PIA	AGL	2005						0	0	1
			2006						0	0	3
			2007						0	0	3
			2008			1			1	1.934198565	0
			2009			1			1	2.282740201	0
			2010				1		1	2.806466098	0
			2011				1		1	2.299114841	0
			2012			1	2		3	6.384744717	0
			2013			1	1		2	4.838163433	1
			2014			1			1	2.53318472	0
Quad City Intl, Moline, IL	MLI	AGL	2004			2	1		3	4.540226406	3
			2006				1		1	1.889287739	1
			2008	1		1	4		6	11.97819968	1
			2009			2	7		9	19.38986556	0
			2012				4		4	10.5632873	0
			2013			2	8		10	28.93685977	0
			2014			2	3		5	14.78896152	0
Southern Illinois Airport, Carbondale/Murphysboro, IL	MDH	AGL	2010				1		1	1.264830133	0
St Louis Downtown Airport, Cahokia/St Louis, IL	CPS	AGL	2004			1	1		2	1.155167933	1
			2006				1		1	0.645132155	2
			2007						0	0	1
			2008				2		2	1.737438321	0
			2009			1			1	0.83948959	0

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			2010				3		3	2.653880858	0
			2011				2		2	2.230350611	0
			2012	1		1	1		3	3.816793893	0
			2014				1		1	1.027295234	3
St Louis Regional, Alton/St Louis, IL	ALN	AGL	2004				1		1	1.421342885	1
			2005						0	0	1
			2006			1			1	0.840625762	1
			2007				2		2	1.837694796	0
University of Illinois-Willard Airport, Champaign-Urbana, IL	CMI	AGL	2008			2			2	1.983792416	0
			2009			2	2		4	4.430414798	0
			2010			1			1	1.287398939	0
			2012				1		1	1.688419133	0
			2013			1	2		3	5.374032674	0
			2004	1					1	1.212532738	0
Waukegan Regional, Chicago/Waukegan, IL	UGN	AGL	2007				1		1	1.445817972	1
			2010			1	1		2	3.987558816	0
			2013			1			1	2.159920515	0
Williamson CO Regional, Marion, IL	MWA	AGL	2012			1			1	3.649235485	0
INDIANA											
			2006						0	0	2
Columbus Muni, IN	BAK	AGL	2007						0	0	2
			2008				1		1	2.537749017	0
			2006			1			1	3.840688251	0
Delaware CO-Johnson Field, Muncie, IN	MIE	AGL	2010				1		1	4.378092027	0
			2011				1		1	4.583161465	0
			2005						0	0	1
Evansville Regional, IN	EVV	AGL	2006				1		1	1.52716055	0
			2007						0	0	2

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Runway Incursion Data for 2004 through 2014 by Airport (Sorted by State)

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			2008			2			2	3.107568483	1
			2012				1		1	2.447081855	0
			2014						0	0	1
Fort Wayne Intl, IN	FWA	AGL	2004			1			1	1.201980864	1
			2005			1			1	1.243533625	0
			2006				4		4	5.416677951	1
			2007				1		1	1.394544542	2
			2008				1		1	1.500060002	0
			2011			2	1		3	7.976601968	0
			2012				2		2	4.881739852	0
			2013			1			1	2.664748048	1
			2014				2		2	5.727868946	1
Gary/Chicago Intl, Gary, IN	GYY	AGL	2009				1		1	2.863606426	2
			2010			1	1		2	5.9326056	0
Indianapolis Intl, IN	IND	AGL	2004						0	0	1
			2005						0	0	3
			2006						0	0	4
			2007						0	0	1
			2008			2			2	0.991556893	2
			2010				2		2	1.196766337	0
			2013			1	2		3	1.951511446	1
			2014						0	0	1
Indianapolis Regional, IN	MQJ	AGL	2011				1		1	N/A	0
Monroe CO Airport, Bloomington, IN	BMG	AGL	2004						0	0	1
			2008				1		1	2.881014117	0
			2010			2			2	7.957348611	0
Purdue University Airport, Lafayette, IN	LAF	AGL	2004				1		1	0.816073381	0
			2005			1			1	0.8916073	0

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			2006				1		1	0.872988852	0
			2007						0	0	1
			2008				1		1	0.921183537	0
			2011				3		3	3.217089178	0
			2012				3		3	3.104272514	2
			2013				6		6	6.484803943	0
			2014			1	2		3	3.070498649	5
			2005			1			1	1.524134673	1
			2006				1		1	1.667139023	0
			2007	1					1	1.892863903	1
South Bend Regional, IN	SBN	AGL	2008			1			1	1.992190613	2
			2011				1		1	2.763270607	0
			2013				1		1	2.762202027	3
			2014			1			1	2.76946937	0
			2004			1			1	1.112458422	0
			2005				1		1	1.244493118	0
			2006						0	0	3
			2009				1		1	2.39308876	0
Terra Haute Intl-Hulman Field, IN	HUF	AGL	2010				1		1	1.844576024	0
			2011				1		1	2.149058712	0
			2013			1	4		5	13.51132249	0
			2014				3		3	6.305567816	0
IOWA											
			2004			1	1		2	1.755001755	1
			2005						0	0	3
Des Moines Intl, IA	DSM	ACE	2006			1	1		2	1.854909017	1
			2008			3	1		4	4.115988558	1
			2009			1	4		5	5.554691492	0

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			2010				2		2	2.399318594	0
			2011			1	2		3	3.622444667	0
			2012			2	2		4	4.874541488	2
			2013				2		2	2.571884162	0
			2014			2	1		3	4.252725288	0
Dubuque Regional, IA	DBQ	ACE	2005						0	0	1
			2006						0	0	1
			2010			1			1	2.117343158	0
Sioux Gateway/Col Bud Day Field, Sioux City, IA	SUX	ACE	2004						0	0	2
			2006				2		2	7.054176072	1
			2007				1		1	4.143360265	0
			2013				1		1	5.644296438	0
			2014						0	0	1
The Eastern Iowa Airport, Cedar Rapids, IA	CID	ACE	2004						0	0	1
			2010			1			1	1.94246421	0
			2013						0	0	1
			2014						0	0	1
Waterloo Muni, IA	ALO	ACE	2005				1		1	2.937288882	1
			2007						0	0	1
			2008				2		2	7.922988551	1
			2009				2		2	7.807010696	0
			2010						0	0	1
			2011			1			1	4.938271605	0
			2013			1	4		5	23.90857361	1
			2014			2	1		3	18.33852925	0
ISLAND OF SAIPAN IN THE MARIANA ISLANDS											
Francisco C. Ada/Saipan Intl, Saipan Island, CQ	GSN	AWP	2011				1		1	2.136934781	0
			2012			1	1		2	2.929716111	0

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KANSAS											
Forbes Field, Topeka, KS	FOE	ACE	2006						0	0	2
			2007						0	0	2
			2008						0	0	2
			2009						0	0	3
			2010				1		1	3.847485668	0
			2012				1		1	4.041710452	0
			2013				1		1	4.138901536	0
Garden City Regional, KS	GCK	ACE	2004			1	1		2	8.747375787	1
			2005			1			1	4.945109287	1
			2007						0	0	1
			2010	1		1	3		5	29.77785719	0
			2011				2		2	12.39464551	0
Hutchinson Muni, KS	HUT	ACE	2004						0	0	1
			2005				1		1	2.017389901	0
			2011				1		1	2.623157232	0
Johnson CO Executive Airport, Olathe, KS	OJC	ACE	2009						0	0	1
			2011				1		1	2.011789084	0
			2012			1			1	1.801639492	0
Manhattan Regional, KS	MHK	ACE	2010			1	1		2	9.238302	0
			2012			1			1	4.274234912	0
New Century Aircenter Airport, Olathe, KS	IXD	ACE	2004						0	0	1
			2006				1		1	1.829792684	1
			2007						0	0	3
			2008				2		2	3.549812747	0
Philip Billard Muni, Topeka, KS	TOP	ACE	2008				1		1	1.641820451	0
Salina Muni, KS	SLN	ACE	2004						0	0	1
			2007			1			1	1.248299192	0

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			2008			1			1	1.419748704	0
			2010				1		1	1.720518909	0
Wichita Mid-Continent Airport, KS	ICT	ACE	2004			1	1		2	1.124037543	2
			2005			1	1		2	1.104282961	3
			2006				1		1	0.574118728	4
			2007				1		1	0.600106819	5
			2008				1		1	0.604631477	0
			2009				2		2	1.313430483	1
			2010				1		1	0.70783431	1
			2011			1			1	0.650283849	1
			2012				1		1	0.603125396	0
			2013				1		1	0.674345211	1
			2014				1		1	0.705815923	0
KENTUCKY											
Barkley Regional, Paducah, KY	PAH	ASO	2011				2		2	6.18563078	0
Blue Grass Airport, Lexington, KY	LEX	ASO	2006						0	0	3
			2007						0	0	2
			2008			3			3	3.909049449	0
			2009			1	1		2	2.960419195	1
			2010			1	1		2	2.901199646	2
			2011				2		2	2.955344741	2
			2012				1		1	1.48231597	0
			2013				1		1	1.545762293	0
			2014			1	1		2	2.946332553	1
Bowman Field, Louisville, KY	LOU	ASO	2007				1		1	0.996085384	0
			2008			1	3		4	4.489287438	0
			2009				1		1	1.340662287	0
			2010				3		3	4.062728528	0

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			2011			3	3		6	8.530724827	1
			2012			4	5		9	11.39024236	0
			2013			3			3	4.019615725	2
			2014			1	3		4	5.524709262	2
Cincinnati/Northern Kentucky Intl, Covington, KY	CVG	ASO	2004			4	2		6	1.157704426	0
			2005	1		2	1		4	0.77099962	0
			2006			1			1	0.272579832	1
			2007				1		1	0.301933279	0
			2008						0	0	1
			2009				1		1	0.430255572	2
			2013			2			2	1.449086351	1
			2014			1			1	0.751218853	0
Louisville Intl-Standiford Field, Louisville, KY	SDF	ASO	2004						0	0	1
			2006				1		1	0.560333959	2
			2007				2		2	1.127828029	2
			2008			2			2	1.198099814	1
			2011				1		1	0.650398044	1
			2012			1	2		3	2.025138722	0
			2013				2		2	1.343553295	3
			2014				1		1	0.673495915	2
Owensboro-Daviess CO Airport, Owensboro, KY	OWB	ASO	2007						0	0	1
			2012				1		1	2.607697924	0
LOUISIANA											
Acadiana Regional, New Iberia, LA	ARA	ASW	2004		1				1	1.399482192	1
			2007						0	0	1
Baton Rouge Metro/Ryan Field, LA	BTR	ASW	2004						0	0	1
			2006						0	0	1
			2007			1	1		2	2.220174728	0

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Runway Incursion Data for 2004 through 2014 by Airport (Sorted by State)

				SEVERITY							
Airport, City	**Code**	**Region**	**Fiscal Year**	**A**	**B**	**C**	**D**	**E**	**Total RIs**	**Annual RI Rate**	**Other Events, Non-RIs**
			2008				5		5	6.368939954	1
			2009				1		1	1.580602842	1
			2010				1		1	1.576988583	5
			2011			3	1		4	5.951052592	0
			2012				2		2	2.939188196	0
			2013			4	1		5	7.593129736	2
			2014			6	3		9	10.33496779	0
Chennault Intl, Lake Charles, LA	CWF	ASW	2006						0	0	1
			2008				1		1	3.316859597	0
			2012				1		1	3.681478482	0
Houma-Terrebonne Airport, Houma, LA	HUM	ASW	2011				1		1	1.366400219	0
			2014				1		1	1.171275636	0
Lafayette Regional, LA	LFT	ASW	2005			1			1	1.336166005	1
			2007						0	0	2
			2008			2			2	2.600408264	3
			2009			2	1		3	3.690899472	0
			2010			1	2		3	4.630987481	4
			2011			2	2		4	6.087446164	1
			2012			3	1		4	6.504593869	6
			2013			5	6		11	18.50107643	1
			2014				1		1	1.785618628	0
Lake Charles Regional, LA	LCH	ASW	2004						0	0	1
			2008						0	0	4
			2010				1		1	2.484533777	0
			2012				1		1	2.168068684	0
			2014				1		1	2.590338039	0
Lakefront Airport, New Orleans, LA	NEW	ASW	2005			1			1	1.14290939	1
			2007						0	0	2

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			2008						0	0	1
			2009				1		1	1.985032852	0
			2010			2	2		4	8.088160954	1
			2011			6			6	10.16828512	0
			2012			8	17		25	42.06346536	2
			2013			1	10		11	18.01064265	1
			2014			1	1		2	3.564172934	0
Louis Armstrong New Orleans Intl, LA	MSY	ASW	2005						0	0	2
			2006				3		3	2.776081284	0
			2007				1		1	0.804233485	1
			2008			3	2		5	3.698744646	3
			2009				2		2	1.686212682	0
			2010			1	4		5	4.214749939	1
			2011			1	2		3	2.43352423	0
			2013				2		2	1.589092469	0
Monroe Regional, LA	MLU	ASW	2007				1		1	2.254994814	1
			2008				2		2	4.413452202	1
			2009			1	4		5	11.86802753	1
			2010				6		6	15.88772673	2
			2011			2	4		6	17.067759	0
			2012				1		1	3.154474622	0
			2013				2		2	5.193860856	0
			2014				1		1	2.866808096	0
Shreveport Downtown Airport, LA	DTN	ASW	2004						0	0	3
			2006						0	0	1
			2007						0	0	3
			2008				3		3	5.427801198	0
			2009				3		3	5.431535495	1

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			2013				1		1	1.691131705	0
			2014			1	7		8	14.53039577	0
Shreveport Regional, LA	SHV	ASW	2004						0	0	1
			2008				1		1	1.811298882	0
			2013						0	0	1
			2014						0	0	1
MAINE											
Bangor Intl, ME	BGR	ANE	2004						0	0	1
			2006						0	0	2
			2008				1		1	1.504211793	0
			2012			1			1	2.096919625	0
			2013			1	1		2	4.755224803	1
Portland Intl Jetport, ME	PWM	ANE	2005						0	0	1
			2006						0	0	5
			2007				1		1	1.341237694	0
			2008			1			1	1.329645782	0
			2010			1			1	1.641928281	0
			2011				2		2	3.491498202	0
			2012			1			1	1.792307417	0
			2013			1	3		4	7.641024661	0
			2014			1	2		3	6.314460114	0
MARYLAND											
Andrews AFB, MD	ADW	AEA	2004				1		1	1.303967975	3
			2005			2			2	2.225956883	0
			2007	1					1	1.005388884	0
			2008				1		1	1.002074294	0
			2009			2			2	2.045408059	1
			2011			1			1	1.097164926	0

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			2013			1	1		2	2.562952521	0
			2014				2		2	2.973845033	1
Baltimore/Washington Intl Thurgood Marshall, MD	BWI	AEA	2004			1	1		2	0.649878148	6
			2005		1	2	1		4	1.279451371	1
			2007			1			1	0.331478161	2
			2008		1	2	2		5	1.749634326	0
			2009			5	1		6	2.260542606	0
			2010				1		1	0.363230866	1
			2011			1	2		3	1.08179058	0
			2012			4	7		11	4.046110952	0
			2013			2	8		10	3.84318277	0
			2014			2	7		9	3.636892639	0
Easton/Newnam Field, Easton, MD	ESN	AEA	2008			3	2		5	12.39218796	0
			2009				4		4	8.244192997	0
			2011				2		2	4.527037733	0
			2012			2	1		3	6.846970216	0
			2013				1		1	2.053092985	0
			2014			2			2	3.210479003	0
Frederick Airport, MD	FDK	AEA	2012			1	1		2	4.266211604	0
			2013			1	2		3	2.952726843	0
			2014				3		3	3.371847323	0
Hagerstown Regional/Richard A. Henson Field, MD	HGR	AEA	2013			1			1	1.710893257	0
Martin State Airport, Baltimore, MD	MTN	AEA	2011				1		1	1.500847979	0
			2013		1		1		2	2.902336381	0
Salisbury-Ocean City Wicomico Regional, Salisbury, MD	SBY	AEA	2004			1			1	1.757098679	0
			2007			1			1	2.073957318	0
			2011			1			1	2.277333698	0

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MASSACHUSETTS											
Barnstable Muni-Boardman/Polando Field, Hyannis, MA	HYA	ANE	2004		1	1			2	1.720060202	0
			2009				1		1	0.885355337	0
Beverly Muni, MA	BVY	ANE	2007						0	0	1
			2014				1		1	2.115954295	0
General Edward Lawrence Logan Intl, Boston, MA	BOS	ANE	2004				1		1	0.244315392	0
			2005	1		3	11		15	3.497506278	4
			2006			2	5		7	1.697554067	12
			2007				4		4	0.974908298	6
			2008			9	8		17	4.419717138	0
			2009			7	2		9	2.502933995	1
			2010			7	4		11	3.003207972	1
			2011			5	4		9	2.40712509	2
			2012			6	3		9	2.471217184	0
			2013			7	8		15	4.151180457	0
			2014			8	2		10	2.713512751	0
Laurence G. Hanscom Field, Bedford MA	BED	ANE	2004						0	0	1
			2005		1				1	0.579743753	0
			2006			1	1		2	1.183480973	0
			2007				3		3	1.770214373	3
			2008			1			1	0.556718479	0
			2009				1		1	0.539115527	0
			2010			2	3		5	2.901393249	2
			2011			3			3	1.791108935	0
			2012			1			1	0.587682181	0
			2013			2			2	1.313784224	1
			2014						0	0	1
Lawrence Muni, MA	LWM	ANE	2006			1			1	1.242668257	0

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			2009				1		1	1.767408978	1
			2010				1		1	1.750118133	1
			2012			1			1	1.885405079	0
Marthas Vineyard Airport, Vineyard Haven, MA	MVY	ANE	2005				1		1	1.885938443	0
			2008			1			1	1.989337153	0
			2010				1		1	2.424477525	0
			2013				1		1	2.18459858	0
Nantucket Memorial Airport, MA	ACK	ANE	2004		1				1	0.699594235	0
			2005						0	0	1
			2007						0	0	1
			2014						0	0	1
New Bedford Regional, MA	EWB	ANE	2009			1	1		2	3.10318076	0
			2010				1		1	1.447827535	0
			2011				1		1	1.797461984	0
Norwood Memorial Airport, MA	OWD	ANE	2006						0	0	1
Worcester Regional, MA	ORH	ANE	2007						0	0	1
MICHIGAN											
Ann Arbor Muni, MI	ARB	AGL	2008				1		1	1.445776165	0
			2009			1	1		2	3.61004314	0
			2010				1		1	1.603129308	0
			2012				1		1	1.569292092	2
			2013				3		3	5.151275799	6
			2014				7		7	12.09879531	6
Battle Creek Intl, Kalamazoo, MI	AZO	AGL	2004				1		1	1.048987727	0
			2005		1		1		2	2.163940102	4
			2006			2			2	2.697162585	2
			2007				1		1	1.575398576	2
			2008				1		1	1.600640256	1

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			2009			2	5		7	13.9795898	1
			2010						0	0	2
			2011				1		1	2.098327633	0
			2012						0	0	1
			2013				3		3	6.673191565	0
Bishop Intl, Flint, MI	FNT	AGL	2005			1			1	0.747305962	0
			2006						0	0	2
			2007			1	1		2	2.351447316	0
			2009			1	3		4	6.697362913	1
			2012			1	2		3	6.754626919	0
			2014				1		1	2.796342384	0
Capital City Airport, Lansing, MI	LAN	AGL	2005			1			1	1.1914123	1
			2006						0	0	3
			2007						0	0	1
			2009			1			1	2.398771829	0
			2010						0	0	1
			2011						0	0	1
			2013						0	0	1
			2014						0	0	2
Cherry Capital Airport, Traverse City, MI	TVC	AGL	2012			2			2	2.349706874	0
			2013			1			1	1.142165317	0
			2014			2	1		3	3.469010176	0
Coleman A. Young Muni, Detroit, MI	DET	AGL	2005				2		2	2.599124095	1
			2006						0	0	2
			2008				1		1	1.673948342	0
			2010				2		2	2.985386533	0
			2011			1	1		2	3.232427715	0
Detroit Metro Wayne CO Airport, MI	DTW	AGL	2004				5		5	0.970883212	2

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			2005				1		1	0.18804875	0
			2006				2		2	0.411651381	4
			2007				2		2	0.423078957	4
			2008			8	3		11	2.351774093	0
			2009			1	3		4	0.912034292	7
			2010			2	2		4	0.897867565	2
			2011			4	1		5	1.118455636	0
			2012			2	1		3	0.693348248	1
			2013			12	3		15	3.524245635	2
			2014		1	4	7		12	3.000780203	0
Gerald R. Ford Intl, Grand Rapids, MI	GRR	AGL	2006						0	0	1
			2007						0	0	1
			2008			1			1	1.000430185	0
			2010				1		1	1.151185145	0
			2012			1			1	1.161683046	0
			2014				1		1	1.343616478	0
Jackson CO-Reynolds Field, Jackson, MI	JXN	AGL	2005						0	0	1
			2006				2		2	4.136675767	1
			2007						0	0	3
			2008				1		1	1.966607013	1
			2013				2		2	4.392901072	0
			2014						0	0	1
MBS Intl, Saginaw, MI	MBS	AGL	2005						0	0	1
			2006						0	0	2
			2007				1		1	2.626326295	2
			2009				1		1	3.220715643	1
			2011			1			1	3.735524841	0
Muskegon CO Airport, MI	MKG	AGL	2004						0	0	1

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			2005			1			1	1.919901701	2
			2009						0	0	1
			2014				1		1	3.058010458	0
Oakland CO Intl, Pontiac, MI	PTK	AGL	2004						0	0	1
			2005				1		1	0.463499421	1
			2006	1					1	0.512670655	4
			2007				1		1	0.478016042	2
			2008				3		3	1.752745969	1
			2009			1	3		4	2.772098825	2
			2010			4	7		11	8.676515827	1
			2011				1		1	0.874944222	0
			2012				2		2	1.535272895	1
			2013			3	2		5	4.019292605	2
			2014				1		1	0.903530092	1
Sawyer Intl, Marquette, MI	SAW	AGL	2006						0	0	1
			2007						0	0	1
			2008				1		1	4.006410256	1
			2012				1		1	5.128731152	0
Willow Run Airport, Detroit, MI	YIP	AGL	2004		1		1		2	1.738873384	1
			2005			2			2	1.867274153	1
			2006				1		1	1.177287764	0
			2010				3		3	4.462957453	0
			2011				5		5	7.432181345	0
			2013			3	5		8	11.7327858	1
W. K. Kellogg Airport, Battle Creek, MI	BTL	AGL	2005						0	0	1
			2006						0	0	1
			2010						0	0	1
			2011				1		1	1.478896152	0

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			2012			1			1	1.213636419	0
MINNESOTA											
Anoka CO-Blaine Airport, Minneapolis, MN	ANE	AGL	2004						0	0	1
			2008			1	3		4	5.638090942	0
			2009						0	0	1
			2014			1			1	1.44667554	0
Crystal Airport, Minneapolis, MN	MIC	AGL	2004						0	0	1
			2005			1			1	1.399305944	2
			2006						0	0	1
			2007				1		1	1.88423274	3
			2008			1	2		3	5.601927063	0
			2009			2	2		4	9.662302527	0
			2010				10		10	22.40996795	4
			2011				6		6	14.57619707	3
			2012				5		5	9.946487895	1
			2013				6		6	14.12994843	0
			2014				2		2	4.670714619	2
Duluth Intl, MN	DLH	AGL	2005				1		1	1.449023358	3
			2006	1					1	1.529894131	0
			2007						0	0	2
			2008				1		1	1.517911354	0
			2010			1			1	1.986807598	1
			2012				1		1	1.60433813	0
			2013			2	4		6	10.88909457	1
			2014			1	3		4	7.382116822	0
Flying Cloud Airport, Minneapolis, MN	FCM	AGL	2004			1			1	0.626625309	4
			2006				2		2	1.406934782	2
			2007						0	0	1

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			2008			2	3		5	4.244049842	0
			2009			4	11		15	12.55923774	0
			2010			3	11		14	14.12771454	3
			2011			2	4		6	5.736905513	1
			2012			3	4		7	7.127220893	1
			2013			3	1		4	5.166023066	1
			2014				5		5	6.804109682	1
Minneapolis-St. Paul Intl (Wold-Chamberlain), MN	MSP	AGL	2004			1	1		2	0.374774667	3
			2005				5		5	0.919482736	3
			2006			3	2		5	1.037738394	1
			2007				2		2	0.436748928	2
			2008				1		1	0.220038947	0
			2009			5	3		8	1.816629426	0
			2010			2	1		3	0.70165919	0
			2011			6	3		9	2.046570857	0
			2012			8			8	1.879893598	1
			2013			7	5		12	2.797222358	0
			2014		1	6			7	1.675073943	0
Rochester Intl, MN	RST	AGL	2004				1		1	1.450158067	0
			2005				1		1	1.506568639	2
			2007			1			1	1.739342181	0
			2010				1		1	2.435697584	0
			2011				3		3	7.482416322	1
			2012				1		1	2.751410098	0
			2014			1			1	2.783576896	0
St Cloud Regional, MN	STC	AGL	2005						0	0	5
			2006						0	0	5
			2007						0	0	6

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				SEVERITY								
Airport, City	**Code**	**Region**	**Fiscal Year**	**A**	**B**	**C**	**D**	**E**	**Total RIs**	**Annual RI Rate**	**Other Events, Non-RIs**
			2008				1		1	2.500562627	0
			2010			1	3		4	11.12501738	0
			2011				1		1	2.855674225	0
St Paul Downtown Holman Field, MN	STP	AGL	2004				1		1	0.764619525	5
			2005				1		1	0.801147243	5
			2006						0	0	3
			2007						0	0	4
			2008				2		2	1.771149742	1
			2010				2		2	2.318975013	0
			2011			1	1		2	2.269040083	0
			2012				1		1	1.225955939	0
			2013			1	1		2	2.78497229	0
			2014				1		1	1.506001416	3
MISSISSIPPI											
Golden Triangle Regional, Columbus-West Point-Starkville, MS	GTR	ASO	2004						0	0	1
			2005						0	0	3
			2006						0	0	1
			2008				2		2	6.210408645	0
			2014						0	0	1
Gulfport-Biloxi Intl, MS	GPT	ASO	2004						0	0	1
			2005						0	0	1
			2006	1					1	1.568135487	2
			2007						0	0	2
			2008				1		1	1.828019889	0
			2010			1	1		2	2.587422539	0
			2013				1		1	1.742554934	0
			2014			1			1	2.051239975	0
Hawkins Field, Jackson, MS	HKS	ASO	2004						0	0	1

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			2010				1		1	2.949678485	0
			2013				1		1	3.334778404	0
Jackson-Evers Intl, Jackson, MS	JAN	ASO	2005						0	0	1
			2008			1	1		2	2.956087323	0
			2010				1		1	1.445817972	0
			2012				1		1	1.911241925	1
			2014						0	0	1
Mid Delta Regional, Greenville, MS	GLH	ASO	2006						0	0	1
			2008				1		1	3.90579229	0
			2009				1		1	3.916500215	0
Tupelo Regional, MS	TUP	ASO	2005						0	0	1
			2009				1		1	1.628929793	0
			2013						0	0	2
MISSOURI											
Branson, MO	BBG	ACE	2010				1		1	14.5327714	0
			2011				1		1	13.78359752	0
			2013				1		1	14.19647927	0
			2014				1		1	13.92175971	0
Cape Girardeau Regional, MO	CGI	ACE	2004						0	N/A	1
Charles B. Wheeler Downtown Airport, Kansas City, MO	MKC	ACE	2005				2		2	1.971822654	7
			2006			1	5		6	7.41885626	4
			2007						0	0	1
			2008			1			1	1.268858408	0
			2010			2			2	2.816703049	1
			2012			1	1		2	2.673796791	0
			2013			2	4		6	8.666512595	0
			2014		1	3			4	5.763605712	0
Jefferson City Memorial Airport, MO	JEF	ACE	2009				1		1	3.858322401	0

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			2012			1			1	3.340682836	0
Joplin Regional, MO	JLN	ACE	2004						0	0	4
			2006						0	0	1
			2008				3		3	12.9237927	0
			2010			1	1		2	9.551554515	0
			2011				4		4	16.0140924	0
			2012			3	7		10	37.90894272	2
			2013			1	8		9	32.04557593	1
			2014				3		3	10.93453856	0
Kansas City Intl, MO	MCI	ACE	2005						0	0	2
			2006						0	0	2
			2008				1		1	0.529122926	1
			2009				1		1	0.660153156	2
			2010			1	3		4	2.747762291	1
			2011			1			1	0.695178244	4
			2013			1	1		2	1.547532459	0
			2014				2		2	1.571054885	0
Lambert-St Louis Intl, MO	STL	ACE	2004			1			1	0.33317674	5
			2005			1	1		2	0.673797692	1
			2006				1		1	0.349153477	1
			2007			1	2		3	1.153792902	1
			2008			1	2		3	1.172365012	0
			2009			1	2		3	1.387687511	1
			2010			3	2		5	2.641184518	0
			2011			4			4	2.102507766	0
			2012			2	1		3	1.55864398	1
			2013			2			2	1.052964094	0
			2014			3			3	1.626501125	1

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Spirit of St Louis Airport, St Louis, MO	SUS	ACE	2006						0	0	3
			2008			1			1	0.80867547	1
			2014						0	0	1
Springfield-Branson National Airport, Springfield, MO	SGF	ACE	2005	1					1	1.164632442	0
			2006						0	0	1
			2007			1			1	1.342209814	4
			2008						0	0	1
			2009						0	0	1
			2010				2		2	3.70130471	0
			2012				1		1	2.220297964	0
MONTANA											
Billings Logan Intl, MT	BIL	ANM	2004				1		1	1.005116041	1
			2005						0	0	4
			2006						0	0	3
			2008			1	4		5	5.237795935	0
			2009			1	4		5	5.9765004	2
			2010			4	8		12	15.33193642	2
			2011			1	1		2	2.441585077	0
			2012			2	1		3	3.518855199	0
			2013				2		2	2.60206604	0
			2014			2	1		3	3.764729504	0
Gallatin Field, Bozeman, MT	BZN	ANM	2005						0	0	1
			2006						0	0	3
			2007				1		1	1.251830803	1
			2008				2		2	2.504727673	0
			2009			2	2		4	5.614980769	0
			2010				2		2	2.855592678	0
			2012			2			2	2.431877044	0

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			2013			1	1		2	2.662513146	0
			2014			1			1	1.26146355	0
			2005						0	N/A	1
Glacier Park Intl, Kalispell, MT	GPI	ANM	2007				1		1	1.817620008	0
			2009			2			2	7.017051435	0
			2005				1		1	2.113137375	1
			2009						0	0	1
			2010			1	2		3	7.008035881	1
Great Falls Intl, MT	GTF	ANM	2011				1		1	2.567789647	0
			2012			1	2		3	8.116004761	0
			2013			1	2		3	8.349800996	1
			2014				2		2	5.973002031	1
			2004			1			1	1.698254195	0
			2005						0	0	2
			2006						0	0	2
			2007		1				1	1.697850521	2
Helena Regional, MT	HLN	ANM	2008				1		1	1.60115283	0
			2010						0	0	1
			2011			1	1		2	4.524375071	0
			2012			1	1		2	4.988775256	1
			2014				2		2	5.431093007	0
			2007						0	0	2
			2008			1	1		2	4.71475719	0
			2009			1	1		2	5.141916907	0
Missoula Intl, MT	MSO	ANM	2010			1			1	2.372254116	0
			2013			1	2		3	8.374741779	0
			2014				2		2	5.899879052	0

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Airport, City	**Code**	**Region**	**Fiscal Year**	**A**	**B**	**C**	**D**	**E**	**Total RIs**	**Annual RI Rate**	**Other Events, Non-RIs**
NEBRASKA											
Central Nebraska Regional, Grand Island, NE	GRI	ACE	2004						0	0	1
			2008				1		1	4.970425966	0
Eppley Airfield, Omaha, NE	OMA	ACE	2004				1		1	0.707979639	3
			2005				1		1	0.680508204	4
			2006				1		1	0.714970043	5
			2007			1			1	0.738285259	3
			2008				7		7	5.592930536	0
			2009				2		2	1.78469446	4
			2010				6		6	5.44652421	1
			2011				1		1	0.908100254	0
			2012			2			2	1.8972452	0
			2013			1	2		3	3.034072636	1
			2014				2		2	2.032169239	1
Lincoln Airport, NE	LNK	ACE	2004						0	0	5
			2005				2		2	2.545565625	4
			2006				1		1	1.171618708	1
			2007						0	0	2
			2008			1			1	1.380719631	1
			2009				3		3	4.492564805	0
			2010			2	3		5	8.094937426	1
			2011				4		4	6.639775576	2
			2012			1	3		4	6.44922045	0
			2013			2	2		4	7.014713361	0
			2014			1	1		2	3.614479605	1
NEVADA											
Elko Regional, NV	EKO	AWP	2004				1		1	3.792331905	2
			2005						0	0	1

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Airport, City	**Code**	**Region**	**Fiscal Year**	**A**	**B**	**C**	**D**	**E**	**Total RIs**	**Annual RI Rate**	**Other Events, Non-RIs**
			2006						0	0	4
Henderson Executive Airport, Las Vegas, NV	HND	AWP	2008			1			1	1.511578693	1
			2009				2		2	3.295110057	1
			2010				5		5	6.519414817	0
			2011			1			1	1.119870991	1
			2012				1		1	1.064361968	0
			2013			1	5		6	6.678316619	1
			2014			2	1		3	3.274394237	0
McCarran Intl, Las Vegas, NV	LAS	AWP	2004			2	2		4	0.710839412	4
			2005			2	4		6	0.994221914	2
			2006			1	4		5	0.808123908	3
			2007				6		6	0.972549782	2
			2008			6	6		12	1.978611213	1
			2009			5	8		13	2.525748059	0
			2010			6	4		10	1.976077605	0
			2011			3	1		4	0.759336037	1
			2012			2	6		8	1.505907865	0
			2013			6	6		12	2.301606329	1
			2014			8	5		13	2.48701967	0
North Las Vegas Airport, NV	VGT	AWP	2004	1		1	1		3	1.307121196	3
			2005	1		1	5		7	3.122727658	4
			2006			3	5		8	3.436514687	9
			2007			1	10		11	5.017332604	13
			2008			2	11		13	7.139836443	7
			2009			1	6		7	5.016302985	2
			2010			2	3		5	3.70592726	2
			2011			3	17		20	13.88483914	0
			2012			3	21		24	16.25586735	0

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			2013			1	11		12	9.649249771	1
			2014			3	9		12	9.109127346	4
Reno/Tahoe Intl, NV	RNO	AWP	2004			2	1		3	2.078022831	6
			2005				3		3	1.935921014	3
			2006	1			1		2	1.296394726	7
			2007			1	5		6	3.697860172	9
			2008			1	1		2	1.441285627	2
			2009			1	1		2	1.94486313	1
			2010			1	1		2	2.154127847	0
			2011	1			4		5	5.641685284	0
			2012			1			1	1.219482452	0
			2013			2	4		6	7.899726143	0
			2014			1	4		5	6.69918002	0
NEW HAMPSHIRE											
Boire Field, Nashua, NH	ASH	ANE	2005						0	0	1
			2006				1		1	0.848126065	1
			2008				1		1	1.00270731	0
			2012				4		4	6.713549622	0
			2013				1		1	1.803068823	0
Lebanon Muni, NH	LEB	ANE	2007						0	0	2
			2009						0	0	1
Manchester Airport, NH	MHT	ANE	2004						0	0	1
			2005				1		1	0.933549917	2
			2007				2		2	2.133629197	1
			2008				16		16	19.75552537	0
			2009				5		5	7.058657443	0
			2010				2		2	2.912352744	0
			2011				3		3	4.538440592	0

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			2012				2		2	3.28779734	0
			2013			1	2		3	5.303632989	0
			2014				3		3	5.684617425	0
NEW JERSEY											
			2004						0	0	4
			2005						0	0	1
			2007						0	0	1
			2008			1	5		6	6.44253793	0
Atlantic City Intl, NJ	ACY	AEA	2009				1		1	1.00336126	0
			2010				3		3	2.797202797	0
			2011						0	0	2
			2012				3		3	3.830488132	0
			2014				3		3	3.735478328	0
			2004				1		1	0.933898653	2
			2005		1	1			2	1.793062641	3
			2006						0	0	3
			2007				2		2	1.993998066	4
Essex CO Airport, Caldwell, NJ	CDW	AEA	2009			1	2		3	3.523152987	0
			2010			1	1		2	2.607833933	0
			2011			1	1		2	2.527901715	0
			2013				1		1	1.273447349	1
			2014			1	1		2	2.604437962	1
			2004						0	0	1
			2007						0	0	2
			2008				1		1	0.70931544	0
Morristown Muni, NJ	MMU	AEA	2010						0	0	1
			2011			1			1	0.893870728	2
			2012			1	1		2	2.961383558	0

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Runway Incursion Data for 2004 through 2014 by Airport (Sorted by State)

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Airport, City	**Code**	**Region**	**Fiscal Year**	**A**	**B**	**C**	**D**	**E**	**Total RIs**	**Annual RI Rate**	**Other Events, Non-RIs**
			2013			2	3		5	8.034580836	0
			2014				2		2	3.022426404	0
Newark Liberty Intl, NJ	EWR	AEA	2004	1		1	3		5	1.151816299	4
			2005	1			4		5	1.134072295	5
			2006			2	5		7	1.564917238	2
			2007						0	0	4
			2008		1	2	5		8	1.796699015	0
			2009			5	5		10	2.377047232	0
			2010			1	1		2	0.489283469	0
			2011			5	2		7	1.697599352	0
			2012			10	3		13	3.051406816	0
			2013			4			4	0.961790469	1
			2014			15	4		19	4.706325301	0
Teterboro Airport, NJ	TEB	AEA	2004			1	3		4	1.810675744	0
			2005		1	2	1		4	1.829064753	6
			2006				3		3	1.502637128	5
			2007	1		1	4		6	2.967461782	4
			2008		1	2	1		4	2.141797718	0
			2009			1	3		4	2.786660257	0
			2010			1			1	0.636634495	1
			2011			4	4		8	4.959394954	0
			2012			7	1		8	4.968789789	0
			2013			5	2		7	4.37669597	0
			2014			2	2		4	2.414438341	2
Trenton Mercer Airport, Trenton, NJ	TTN	AEA	2005						0	0	1
			2006						0	0	2
			2007						0	0	2
			2009						0	0	1

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Airport, City	**Code**	**Region**	**Fiscal Year**	**A**	**B**	**C**	**D**	**E**	**Total RIs**	**Annual RI Rate**	**Other Events, Non-RIs**
			2010			1			1	1.189654762	0
			2011			1	1		2	2.566504549	0
			2012				2		2	2.544399776	0
			2013				1		1	1.25495708	1
			2014			2			2	2.588360144	0
NEW MEXICO											
			2004			1	1		2	0.995976256	0
			2005				1		1	0.508869597	2
			2006			1	1		2	1.024584915	2
			2007				1		1	0.526041694	3
			2008			2			2	1.07812062	0
Albuquerque Intl Sunport, NM	ABQ	ASW	2009			2	2		4	2.483500245	0
			2010			1	3		4	2.547511082	1
			2011			3	4		7	4.517323937	0
			2012			2	3		5	3.319281707	1
			2013			2	5		7	5.036297314	1
			2014			2	2		4	3.039421294	1
			2011				1		1	1.429858301	0
Double Eagle II, Albuquerque, NM	AEG	ASW	2012				1		1	1.47273236	0
			2013				1		1	1.532754974	1
			2007				1		1	0.964906356	0
			2009				1		1	1.468515038	0
Four Corners Regional, Farmington, NM	FMN	ASW	2010						0	0	1
			2013				1		1	2.715472764	0
			2014				1		1	2.846488856	1
			2011				1		1	8.797395971	0
Lea CO Regional, Hobbs, NM	HOB	ASW	2012						0	0	1
			2013				1		1	11.26506703	0

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Airport, City	**Code**	**Region**	**Fiscal Year**	**A**	**B**	**C**	**D**	**E**	**Total RIs**	**Annual RI Rate**	**Other Events, Non-RIs**
Roswell Intl Air Center, NM	ROW	ASW	2005			1			1	1.621165943	1
			2008				1		1	1.808808899	0
			2012						0	0	1
			2014			1			1	2.097095523	1
Santa Fe Muni, NM	SAF	ASW	2014						0	0	1
NEW YORK											
Albany Intl, NY	ALB	AEA	2004				1		1	0.742351919	1
			2007						0	0	1
			2008			1			1	1.060299216	0
			2009			1			1	1.068661501	0
			2010			1	1		2	2.10059762	0
			2012			1			1	1.293092301	0
			2013			2			2	2.699273895	0
			2014			1			1	1.382341964	0
Buffalo Niagara Intl, NY	BUF	AEA	2004	1					1	0.708546488	0
			2005						0	0	1
			2007				1		1	0.727452606	1
			2008			1			1	0.72190699	0
			2009				2		2	1.508159141	0
			2010			1	2		3	2.289726759	0
			2012			2			2	1.604209446	0
			2013			2	1		3	2.41021933	0
			2014			1	1		2	1.664115024	0
Dutchess CO Airport, Poughkeepsie, NY	POU	AEA	2004						0	0	1
			2005						0	0	1
			2006				1		1	0.879136336	0
			2007						0	0	1
			2008				2		2	2.320024128	1

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Airport, City	**Code**	**Region**	**Fiscal Year**	**A**	**B**	**C**	**D**	**E**	**Total RIs**	**Annual RI Rate**	**Other Events, Non-RIs**
			2009				2		2	3.518401238	0
			2010			1			1	1.467739095	0
			2011				3		3	4.218934578	0
			2012			2			2	2.311310397	0
			2013				2		2	2.504257237	0
Elmira/Corning Regional, NY	ELM	AEA	2004				1		1	1.995171685	1
			2006				1		1	2.582244487	1
			2008				1		1	2.663683341	0
			2012				1		1	3.71830148	0
			2014			1	1		2	9.084302326	2
Francis S. Gabreski Airport, Westhampton Beach, NY	FOK	AEA	2011				1		1	1.807435791	0
			2012				1		1	1.636072118	0
Greater Binghamton/Edwin A. Link Field, NY	BGM	AEA	2004				1		1	2.774155963	1
			2006						0	0	2
			2008				1		1	4.386734515	1
			2009				1		1	4.600239212	1
			2011				1		1	4.819973972	0
			2012				3		3	13.30908123	0
Greater Rochester Intl, NY	ROC	AEA	2004						0	0	1
			2005						0	0	1
			2006				1		1	0.725968624	1
			2007		1				1	0.836638054	7
			2009				2		2	1.865689046	0
			2011				1		1	0.95640697	0
			2012			1			1	1.067452312	0
			2013			1			1	1.092132279	0
			2014			2	1		3	3.374843913	3
Ithaca Tompkins Regional, Ithaca, NY	ITH	AEA	2005						0	0	1

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Runway Incursion Data for 2004 through 2014 by Airport (Sorted by State)

				SEVERITY							
Airport, City	**Code**	**Region**	**Fiscal Year**	**A**	**B**	**C**	**D**	**E**	**Total RIs**	**Annual RI Rate**	**Other Events, Non-RIs**
			2006						0	0	1
			2007						0	0	1
			2010				1		1	2.190676481	0
John F Kennedy Intl, New York, NY	JFK	AEA	2004				1		1	0.313904724	0
			2005	1		1	2		4	1.111089507	1
			2006			1	3		4	1.062990138	3
			2007				2		2	0.441249796	1
			2008			9	2		11	2.428465144	0
			2009			2	6		8	1.854582209	0
			2010			6	2		8	1.984648742	0
			2011			2	1		3	0.726251574	1
			2012			4	2	1	7	1.699553018	1
			2013			1	4		5	1.223214657	1
			2014			13	1		14	3.289319111	2
La Guardia Airport, New York, NY	LGA	AEA	2004				1		1	0.250891291	1
			2005						0	0	1
			2006				2		2	0.49330584	0
			2007			2	3		5	1.245609227	0
			2008			2	1		3	0.768190757	0
			2009			2	2		4	1.114221647	0
			2010			2	1		3	0.822702193	0
			2012	1		6	1		8	2.124726773	0
			2013			5	1		6	1.615334913	0
			2014			12			12	3.239959501	1
Long Island MacArthur Airport, Islip, NY	ISP	AEA	2004				1		1	0.561968238	0
			2005				1		1	0.567147419	1
			2006	1					1	0.542605374	3
			2007				1		1	0.53917657	1

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			2008				1		1	0.547936198	0
			2010			1	2		3	1.932566319	0
			2011			2	1		3	2.281021898	0
			2012				1		1	0.645190428	0
			2013				1		1	0.896193865	1
Niagara Falls Intl, NY	IAG	AEA	2005				1		1	2.1165365	0
			2006						0	0	5
			2007						0	0	6
			2008				1		1	3.091859135	0
			2009				2		2	5.322687957	0
			2010			1			1	2.761973154	0
			2011				1		1	3.529577862	0
			2012				2		2	7.906388362	0
Oneida CO Airport, Utica, NY	UCA	AEA	2005						0	0	1
			2006						0	0	2
Republic Airport, Farmingdale, NY	FRG	AEA	2004				1		1	0.501177768	0
			2005				1		1	0.490410032	2
			2006			1			1	0.520218284	0
			2007				1		1	0.52429862	1
			2009			2	1		3	1.751845277	0
			2010			3	1		4	2.07851594	0
			2011			2			2	1.102687802	0
			2012			5			5	2.313144211	0
			2013			2	2		4	1.887175229	0
			2014			3			3	1.543090811	0
Rome/Griffiss Intl, Rome, NY	RME	AEA	2010				1		1	1.9132165	0
Stewart Intl, Newburgh, NY	SWF	AEA	2004	1					1	0.966360974	0
			2008			2			2	2.349044526	0

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			2009			1	1		2	4.419889503	0
			2010				1		1	2.221037669	0
Syracuse Hancock Intl, NY	SYR	AEA	2004						0	0	3
			2005				2		2	1.605639004	1
			2006				1		1	0.859409242	0
			2008		1	1			2	1.90077932	1
			2009						0	0	1
			2012			1			1	1.462437298	0
			2013			1	1		2	3.036698501	1
			2014				1		1	1.62927481	0
Westchester CO Airport, White Plains, NY	HPN	AEA	2004		1				1	0.519853193	1
			2005			2			2	1.023923984	1
			2006			1			1	0.524128244	0
			2007				1		1	0.49365164	0
			2008			1	4		5	2.664023955	0
			2009			1			1	0.583056382	0
			2010				1		1	0.542658375	0
			2011			2	2		4	2.068915578	0
			2012	1		5	3		9	4.700868094	0
			2013				2		2	1.1622231	0
			2014			1			1	0.654116354	3
NORTH CAROLINA											
Asheville Regional, NC	AVL	ASO	2004						0	0	1
			2006						0	0	1
			2008						0	0	1
			2010			2			2	2.922438483	0
			2012				1		1	1.61631835	0
			2013				2		2	3.237450831	0

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			2014			1			1	1.452074288	0
Charlotte/Douglas Intl, NC	CLT	ASO	2004				1		1	0.21812915	3
			2005				4		4	0.77178657	2
			2006			1	1		2	0.394188091	7
			2007				3		3	0.573847475	5
			2008			3	4		7	1.294960568	1
			2009	1		3	3		7	1.357928654	0
			2010			4	3		7	1.355063388	2
			2011			5	6		11	2.021999353	3
			2012		1	4	5		10	1.818403333	1
			2013			9	5		14	2.520292858	1
			2014	1		7	6		14	2.560004681	2
Coastal Carolina Regional, New Bern, NC	EWN	ASO	2011						0	0	3
			2013				1		1	3.076071242	0
			2014			1			1	3.278903535	2
Concord Regional, NC	JQF	ASO	2005						0	0	1
			2010						0	0	1
			2011						0	0	1
Fayetteville Regional/Grannis Field, NC	FAY	ASO	2013			1	2		3	6.661929295	0
			2014				2		2	5.301805265	0
Hickory Regional, NC	HKY	ASO	2004						0	0	2
			2009			1			1	3.249918752	0
			2013				2		2	6.539366989	0
			2014						0	0	1
Piedmont Triad Intl, Greensboro, NC	GSO	ASO	2004						0	0	1
			2005				1		1	0.746090486	0
			2006						0	0	3
			2007				1		1	0.914452929	2

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			2008				2		2	1.97951205	0
			2009				3		3	3.604902668	1
			2010			3	3		6	6.86176965	1
			2011			1	2		3	3.317079643	0
			2012						0	0	1
			2013			2	3		5	6.043391551	0
			2014			1			1	1.282199228	0
Raleigh-Durham Intl, NC	RDU	ASO	2005						0	0	2
			2006				1		1	0.411685275	4
			2007				1		1	0.397232087	20
			2008			3	2		5	2.096717379	6
			2010				3		3	1.604218024	0
			2011			1			1	0.522277758	0
			2012			3			3	1.56732442	0
			2014				2		2	1.0854051	2
Smith Reynolds Airport, Winston Salem, NC	INT	ASO	2007						0	0	1
Wilmington Intl, NC	ILM	ASO	2004			1	1		2	2.417970356	0
			2005						0	0	2
			2006						0	0	2
			2007				1		1	1.171330514	0
			2008			2	1		3	4.141186864	0
			2011			1	1		2	3.602175714	0
			2012				1		1	1.897353192	1
			2014				2		2	4.331535746	0
NORTH DAKOTA											
Bismarck Muni, ND	BIS	AGL	2006						0	0	1
			2008				2		2	4.186289901	0

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			2011				1		1	2.089820484	0
			2012			1	1		2	3.920799843	0
Grand Forks Intl, ND	GFK	AGL	2004	1	1				2	0.748629073	2
			2005	1					1	0.393369366	1
			2006			1			1	0.439052875	3
			2007						0	0	3
			2008			1	1		2	0.868734254	4
			2009			3	2		5	1.512497769	3
			2010			3	1		4	1.167450318	2
			2011				1		1	0.28968462	2
			2012		1	2			3	0.806425599	0
			2013			1	1		2	0.585567517	1
			2014			2	1		3	0.925366137	1
Hector Intl, Fargo, ND	FAR	AGL	2004						0	0	6
			2005				1		1	1.262530616	3
			2006						0	0	2
			2007						0	0	2
			2009				2		2	2.434511637	0
			2010				1		1	1.282890095	0
			2011						0	0	1
			2012				2		2	2.472890933	0
			2013				2		2	2.511584684	0
			2014			1	1		2	2.606916149	0
Minot Intl, ND	MOT	AGL	2008				1		1	2.835029626	0
			2009				1		1	2.67044089	0
OHIO											
Akron-Canton Regional, Akron, OH	CAK	AGL	2004						0	0	1
			2005			1	1		2	1.858217969	2

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			2006				1		1	0.932392239	1
			2007						0	0	2
			2008				2		2	1.90218942	0
			2009				2		2	2.388858365	0
			2011				1		1	1.436575205	0
			2012			1	1		2	2.790022878	1
Bolton Field, Columbus, OH	TZR	AGL	2005						0	0	1
			2006						0	0	1
			2007						0	0	1
			2009				2		2	8.045699574	0
			2010				2		2	8.457374831	1
			2011				1		1	5.47645126	0
			2013				1		1	4.68735352	0
Burke Lakefront Airport, Cleveland, OH	BKL	AGL	2005						0	0	1
			2007						0	0	2
			2010				2		2	3.623976227	0
			2011				1		1	1.859773108	0
			2012				1		1	1.625804773	0
			2013						0	0	1
Cincinnati Muni-Lunken Field, OH	LUK	AGL	2005				1		1	1.148501206	1
			2006						0	0	1
			2007				1		1	1.375194246	0
			2008			2	3		5	7.09320471	1
			2009				1		1	1.630417061	0
			2011			1	2		3	4.768186659	1
Cleveland-Hopkins Intl, OH	CLE	AGL	2004			3	2		5	1.891167115	2
			2005				2		2	0.76426598	2
			2006	1			3		4	1.594851818	2

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			2007			1	6		7	2.837477402	6
			2008		1	5	8		14	5.707204122	1
			2009			5	3		8	3.930489297	0
			2010			1	3		4	2.066959141	1
			2011				3		3	1.573333054	2
			2012			1	1		2	1.090798028	0
			2013			4	1		5	2.771572535	2
			2014		1				1	0.677956909	0
Cuyahoga CO Airport, Cleveland, OH	CGF	AGL	2011				1		1	2.803161967	0
			2013				1		1	3.389945422	0
James M Cox Dayton Intl, OH	DAY	AGL	2004						0	0	1
			2005						0	0	2
			2006						0	0	2
			2007						0	0	1
			2009			1			1	1.489447266	0
			2011				2		2	2.992309764	0
			2012				3		3	4.662004662	0
			2013			1	4		5	8.218007298	0
			2014			1	1		2	3.641461683	0
Mansfield Lahm Regional, OH	MFD	AGL	2004				1		1	2.734855736	0
			2005				2		2	6.004924038	1
			2006			1	1		2	5.603967609	1
			2009				2		2	8.753501401	0
			2012			1	2		3	16.36661211	1
			2013				3		3	18.27151471	4
Ohio State University Airport, Columbus, OH	OSU	AGL	2004				2		2	2.00382731	1
			2005						0	0	1
			2007						0	0	5

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Airport, City	Code	Region	Fiscal Year	SEVERITY					Total RIs	Annual RI Rate	Other Events, Non-RIs
				A	B	C	D	E			
			2008			2	2		4	5.739539689	1
			2010				1		1	1.441358336	0
			2011			1			1	1.426492825	0
			2013				5		5	6.850910486	0
			2014			2	2		4	5.626353841	0
Port Columbus Intl, Columbus, OH	CMH	AGL	2004				1		1	0.436062357	0
			2006						0	0	3
			2007						0	0	3
			2008						0	0	2
			2009				3		3	2.037406789	0
			2010				1		1	0.723939971	1
			2011			1	1		2	1.471410494	1
			2012			1			1	0.756092213	0
			2013			1	1		2	1.57267323	0
			2014			1			1	0.799552251	1
Toledo Express Airport, OH	TOL	AGL	2006						0	0	1
			2007						0	0	3
			2009				2		2	3.192746081	0
			2010				3		3	4.494449355	0
			2012				1		1	3.069461923	0
			2014			1			1	3.306987665	0
Youngstown-Warren Regional, Youngstown, OH	YNG	AGL	2005						0	0	1
			2006				1		1	1.34461013	1
			2008			1	3		4	6.514764084	1
			2009				2		2	3.548679004	0
			2010				2		2	4.347353549	0
			2013						0	0	1
			2014						0	0	1

NOTE: *In 2007, the FAA changed the way we counted total runway incursions to align with our international partners. At that point, we started including – under Category "D" – runway incursion events that did not involve another vehicle/aircraft. Prior to late 2007, those events were not included in this data set.*

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				SEVERITY							
Airport, City	**Code**	**Region**	**Fiscal Year**	**A**	**B**	**C**	**D**	**E**	**Total RIs**	**Annual RI Rate**	**Other Events, Non-RIs**
OKLAHOMA											
Ardmore Muni, OK	ADM	ASW	2004						0	0	1
			2006						0	0	1
			2013						0	0	1
			2014				4		4	19.88664612	0
Enid Woodring Regional, Enid, OK	WDG	ASW	2005						0	0	1
			2006		1				1	3.288608261	0
			2007						0	0	1
			2013			1			1	2.559508574	0
Lawton-Fort Sill Regional, OK	LAW	ASW	2013			1			1	4.558924094	0
			2014				1		1	3.86115294	0
Richard Lloyd Jones Jr Airport, Tulsa, OK	RVS	ASW	2004				1		1	0.347327144	0
			2005			1	2		3	0.888612432	1
			2006				1		1	0.394905716	4
			2007				1		1	0.371444809	3
			2008				1		1	0.293635739	1
			2010				2		2	0.961885295	0
			2012			1	1		2	1.138569615	0
			2013				1		1	0.709592268	2
			2014			3	2		5	3.851041707	0
Stillwater Regional, OK	SWO	ASW	2004			1			1	1.671374371	2
			2009			2	1		3	5.279552294	0
			2010				1		1	1.906650397	0
			2011				4		4	6.639885794	0
			2012				4		4	6.918021446	0
Tulsa Intl, OK	TUL	ASW	2004						0	0	4
			2005				1		1	0.630473296	2
			2006						0	0	1

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Airport, City	**Code**	**Region**	**Fiscal Year**	**A**	**B**	**C**	**D**	**E**	**Total RIs**	**Annual RI Rate**	**Other Events, Non-RIs**
			2007				2		2	1.472710671	4
			2008			2	2		4	2.957529871	0
			2009			1	1		2	1.698715771	0
			2010						0	0	1
			2011				2		2	1.84984785	1
			2012				4		4	3.948745286	1
			2013			1	8		9	9.384286534	0
			2014			1	2		3	3.111613579	0
University of Oklahoma Westheimer Airport, Norman, OK	OUN	ASW	2005				1		1	0.979931013	0
			2007						0	0	2
Wiley Post Airport, Oklahoma City, OK	PWA	ASW	2006						0	0	1
			2008				1		1	1.346003715	0
			2009						0	0	1
			2014			1			1	1.74437874	0
Will Rogers World Airport, Oklahoma City, OK	OKC	ASW	2004						0	0	5
			2005			1			1	0.882628113	1
			2006						0	0	4
			2008				1		1	0.752134181	0
			2012				2		2	1.608661031	0
			2013			1			1	0.912050929	1
			2014			1	3		4	3.251213109	0
OREGON											
Eastern Oregon Regional at Pendleton, OR	PDT	ANM	2009						0	0	1
			2010				1		1	7.61730652	0
			2011				1		1	8.182636445	0
			2014				1		1	7.973845786	0
Mahlon Sweet Field Airport, Eugene, OR	EUG	ANM	2004				2		2	2.161344356	8
			2005						0	0	3

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Airport, City	**Code**	**Region**	**Fiscal Year**	**A**	**B**	**C**	**D**	**E**	**Total RIs**	**Annual RI Rate**	**Other Events, Non-RIs**
			2006				1		1	1.088091922	1
			2007						0	0	3
			2008			1	3		4	5.036895258	1
			2009				2		2	2.705261734	0
			2010			1	1		2	2.848597066	1
			2011			1			1	1.435214421	1
			2012				2		2	3.418920305	1
			2013				1		1	1.717652313	1
			2014				1		1	1.568160078	0
McNary Field, Salem, OR	SLE	ANM	2004						0	0	2
			2005				2		2	4.114549045	0
			2006						0	0	1
			2008				1		1	1.50579732	0
			2009			1			1	1.945260373	1
			2010			2			2	5.03626108	0
			2012				1		1	3.182787485	0
			2013				2		2	5.950432894	2
			2014				1		1	2.953424496	0
Portland-Hillsboro Airport, Portland, OR	HIO	ANM	2004		1				1	0.548570425	0
			2005				1		1	0.456527198	0
			2007						0	0	1
			2008			2	1		3	1.150973148	0
			2009			3			3	1.302202024	0
			2010				1		1	0.450687975	0
			2011			1	3		4	1.881980973	0
			2012			5	1		6	2.918557649	1
			2013			3	5		8	3.810104397	1
			2014			2	8		10	4.486075223	2

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Runway Incursion Data for 2004 through 2014 by Airport (Sorted by State)

				SEVERITY							
Airport, City	**Code**	**Region**	**Fiscal Year**	**A**	**B**	**C**	**D**	**E**	**Total RIs**	**Annual RI Rate**	**Other Events, Non-RIs**
Portland Intl, OR	PDX	ANM	2005				1		1	0.383847689	0
			2006				1		1	0.382494014	0
			2007						0	0	2
			2008			4	1		5	1.907137653	0
			2009			1	1		2	0.875193089	0
			2010			1			1	0.447421287	1
			2011			1	3		4	1.81098726	1
			2012			4	1		5	2.304604138	1
			2013			1			1	0.480595939	2
			2014			1	3		4	1.833667978	0
Portland-Troutdale Airport, Portland, OR	TTD	ANM	2004						0	0	1
			2005						0	0	3
			2006						0	0	3
			2008			1			1	1.065178258	1
			2009			2	1		3	3.950643296	2
			2012				2		2	2.184455415	0
			2013			1	1		2	1.819852774	2
			2014				2		2	2.013470115	1
Roberts Field, Redmond, OR	RDM	ANM	2004				1		1	1.7826583	0
			2007			1	1		2	2.106682397	0
			2009			1	3		4	7.180555057	0
			2010				2		2	3.849262866	0
			2011				1		1	2.150075253	0
			2012				4		4	8.613820876	0
			2013			1	4		5	11.59931332	0
			2014	1		1	2		4	9.156461028	1
Rogue Valley Intl-Medford Airport, Medford, OR	MFR	ANM	2011			1			1	2.302980056	0
			2012						0	0	1

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Airport, City	**Code**	**Region**	**Fiscal Year**	**A**	**B**	**C**	**D**	**E**	**Total RIs**	**Annual RI Rate**	**Other Events, Non-RIs**
			2013			1			1	2.489357995	0
			2014				1		1	2.52825323	0
			2010				3		3	14.2612664	0
Southwest Oregon Rgnl, North Bend, OR	OTH	ANM	2013						0	0	1
			2014						0	0	1
PENNSYLVANIA											
			2004				1		1	1.086554969	2
			2007						0	0	1
Allegheny CO Airport, Pittsburgh, PA	AGC	AEA	2011				1		1	1.549810923	0
			2013				2		2	3.210375935	0
			2004						0	0	3
			2009				1		1	3.826432999	0
Capital City Airport, Harrisburg, PA	CXY	AEA	2010				1		1	3.682427456	0
			2013						0	0	1
			2014				2		2	8.862498338	0
			2005						0	0	1
			2009						0	0	1
Erie Intl/Tom Ridge Field, PA	ERI	AEA	2011			1			1	3.704389702	0
			2012				1		1	3.896356906	0
			2014				1		1	5.093984005	0
			2004						0	0	8
			2005						0	0	4
			2007				1		1	1.390453149	0
Harrisburg Intl, PA	MDT	AEA	2008				1		1	1.473448459	0
			2012			1			1	1.620010368	3
			2013				1		1	1.843148097	0
			2014						0	0	2
Lancaster Airport, PA	LNS	AEA	2004						0	0	1

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Airport, City	**Code**	**Region**	**Fiscal Year**	**A**	**B**	**C**	**D**	**E**	**Total RIs**	**Annual RI Rate**	**Other Events, Non-RIs**
			2005						0	0	1
			2009			1			1	1.103277838	0
			2013			1			1	1.290505749	0
			2014				5		5	6.019020104	1
Lehigh Valley Intl, Allentown, PA	ABE	AEA	2004						0	0	1
			2005						0	0	1
			2007						0	0	1
			2008	1			1		2	1.631920362	0
			2009				2		2	1.924779613	0
			2010			1			1	1.028055638	1
			2013			1			1	0.907095299	1
			2014			1	2		3	2.94010996	0
Northeast Philadelphia Airport, PA	PNE	AEA	2004			1			1	0.897392178	1
			2005				1		1	0.923343983	2
			2006			1	2		3	2.905287623	1
			2007						0	0	2
			2008			2	1		3	3.35124387	2
			2009			1	1		2	2.809225497	0
			2010			1			1	1.234537419	0
			2011				2		2	3.164857423	0
			2012				1		1	1.390801241	1
			2013		1		2		3	4.377772589	0
			2014			1	2		3	4.087527591	0
Philadelphia Intl, PA	PHL	AEA	2004			2	5		7	1.536567002	6
			2005	1		2	6		9	1.682356196	5
			2006			3	4		7	1.346780617	0
			2007			1	3		4	0.79282022	3
			2008			9	5		14	2.812820837	1

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Runway Incursion Data for 2004 through 2014 by Airport (Sorted by State)

				SEVERITY							
Airport, City	**Code**	**Region**	**Fiscal Year**	**A**	**B**	**C**	**D**	**E**	**Total RIs**	**Annual RI Rate**	**Other Events, Non-RIs**
			2009			2	8		10	2.101343599	0
			2010			6	6		12	2.609501194	1
			2011			5	5		10	2.212041914	0
			2012			9	3		12	2.680605817	0
			2013			3	3		6	1.378784188	0
			2014		1	3	5		9	2.141750572	1
Pittsburgh Intl, PA	PIT	AEA	2004			1			1	0.281316901	2
			2005				1		1	0.359143801	2
			2007						0	0	1
			2008			3			3	1.689569723	0
			2009			1			1	0.665801125	0
			2010			1			1	0.698343529	0
			2011				7		7	4.641078852	1
			2012			1	3		4	2.845496646	4
			2013			1	1		2	1.440818385	2
Reading Regional/Carl A Spaatz Field, PA	RDG	AEA	2004						0	0	1
			2007						0	0	1
			2008	1			2		3	3.287383024	0
			2009				1		1	1.088435374	2
			2011				2		2	2.468800533	1
			2012			1	1		2	2.303377904	0
			2013				1		1	1.4211005	0
University Park, PA	UNV	AEA	2012			1			1	2.505261048	0
Wilkes-Barre/Scranton Intl, PA	AVP	AEA	2004						0	0	1
			2007						0	0	1
			2008				2		2	2.842847396	0
			2010				1		1	1.584158416	0
			2013				1		1	2.626947225	0

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Airport, City	**Code**	**Region**	**Fiscal Year**	**A**	**B**	**C**	**D**	**E**	**Total RIs**	**Annual RI Rate**	**Other Events, Non-RIs**
Williamsport Regional, PA	IPT	AEA	2009				2		2	9.139514692	0
			2010				1		1	4.616165813	0
			2013				1		1	4.831384675	0
PUERTO RICO											
Aguadilla/Rafael Hernandez Airport, PR	BQN	ASO	2008				2		2	3.661796477	0
			2009				2		2	3.213315981	0
			2010				1		1	1.478918024	0
			2011						0	0	1
Fernando Luis Ribas Dominicci Airport, San Juan, PR	SIG	ASO	2004			2	1		3	2.398292416	6
			2005						0	0	3
			2006						0	0	1
			2007						0	0	1
			2008						0	0	1
			2009			1			1	1.02406554	0
			2010			1			1	1.016249835	0
			2011						0	0	3
			2012						0	0	1
			2013			1			1	0.876270592	7
			2014			2	3		5	4.883814063	8
Luis Munoz Marin Intl, San Juan, PR	SJU	ASO	2004						0	0	8
			2005						0	0	8
			2006				1		1	0.505466622	9
			2007						0	0	6
			2008			1	1		2	1.093487734	4
			2009			2	3		5	2.922814319	0
			2010				2		2	1.190270727	0
			2011			2	2		4	2.47494122	3
			2012			1			1	0.624149596	2

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Airport, City	**Code**	**Region**	**Fiscal Year**	**A**	**B**	**C**	**D**	**E**	**Total RIs**	**Annual RI Rate**	**Other Events, Non-RIs**
			2013			8	1		9	5.943104678	2
			2014			5	3		8	5.388439104	3
RHODE ISLAND											
Theodore Francis Green State Airport, Providence, RI	PVD	ANE	2004			1			1	0.850643937	0
			2005			1			1	0.810898476	0
			2006			2	1		3	2.803188159	1
			2008			2	1		3	3.18342919	0
			2009			1	1		2	2.372000901	0
			2010				4		4	4.986971537	0
			2011				1		1	1.258083184	0
			2013				1		1	1.378473754	0
SOUTH CAROLINA											
Charleston AFB/Intl, SC	CHS	ASO	2004						0	0	3
			2005	1		1	1		3	2.39243989	3
			2006			1	1		2	1.811692664	5
			2007				2		2	1.790333987	0
			2008			2	3		5	4.452875222	0
			2009				2		2	1.980099995	0
			2010	1		1	5		7	6.902876527	0
			2011				1		1	0.981392793	0
			2012			2	4		6	5.566998831	1
			2013			1	4		5	4.796669193	0
			2014			1	1		2	1.887486906	0
Columbia Metro, SC	CAE	ASO	2004			2			2	1.734906315	0
			2005						0	0	1
			2006						0	0	5
			2007				2		2	2.065838266	3
			2008			1	2		3	3.255173012	1

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Runway Incursion Data for 2004 through 2014 by Airport (Sorted by State)

Airport, City	Code	Region	Fiscal Year	SEVERITY					Total RIs	Annual RI Rate	Other Events, Non-RIs
				A	B	C	D	E			
			2009			1	1		2	2.777700619	0
			2010			2	1		3	4.977600796	0
			2012			1	2		3	5.650355972	0
			2013			1	2		3	5.671506352	1
			2014			1	6		7	13.42874134	0
Donaldson Center Airport, Greenville, SC	GYH	ASO	2007			1			1	2.187226597	2
			2008				1		1	2.575925401	0
			2013						0	0	1
Florence Regional, SC	FLO	ASO	2006						0	0	2
			2008				1		1	3.561126741	0
			2009				1		1	4.667444574	0
			2010				2		2	9.466559379	0
			2011			1	1		2	11.75640724	0
			2013				1		1	5.255965521	0
			2014				1		1	6.686726847	0
Grand Strand Airport, North Myrtle Beach, SC	CRE	ASO	2014				3		3	7.015246469	2
Greenville Downtown Airport, SC	GMU	ASO	2014				1		1	2.093933874	0
Greenville Spartanburg Intl, Greer, SC	GSP	ASO	2009			1			1	2.021590587	0
			2012				1		1	2.006621852	0
			2013						0	0	1
			2014						0	0	1
Myrtle Beach Intl, SC	MYR	ASO	2004						0	0	1
			2007						0	0	1
			2010				1		1	0.994995174	0
			2013				1		1	0.702903695	1
			2014				1		1	0.661401907	0

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Airport, City	**Code**	**Region**	**Fiscal Year**	**A**	**B**	**C**	**D**	**E**	**Total RIs**	**Annual RI Rate**	**Other Events, Non-RIs**
SOUTH DAKOTA											
Joe Foss Field, Sioux Falls, SD	FSD	AGL	2005				1		1	1.102596615	4
			2006				1		1	1.136311986	3
			2007						0	0	2
			2008			2	1		3	4.467343717	1
			2009				2		2	3.230443701	1
			2011				1		1	1.52723052	0
			2012				1		1	1.504053424	0
			2013				1		1	1.505502612	0
			2014				1		1	1.465179997	0
Rapid City Regional, SD	RAP	AGL	2004						0	0	2
			2005						0	0	1
			2008			1	2		3	6.968317384	0
			2013						0	0	1
TENNESSEE											
Lovell Field, Chattanooga, TN	CHA	ASO	2006						0	0	1
			2007			1			1	1.271439651	0
			2008				1		1	1.339423244	0
			2009			1			1	1.721437056	0
			2010				1		1	1.813960238	0
			2011				1		1	1.902225604	1
			2013			1			1	1.801412307	0
			2014						0	0	1
McGhee Tyson Airport, Knoxville, TN	TYS	ASO	2004						0	0	3
			2005			1	1		2	1.453763066	2
			2006				1		1	0.760051684	1
			2007				2		2	1.537822751	3
			2008				6		6	4.787132189	0

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			2009			1	4		5	4.70300522	0
			2010			1	1		2	1.853568119	0
			2012				2		2	1.885742841	0
			2013			1			1	0.981026939	1
			2014				1		1	0.989217529	1
McKellar-Sipes Regional, Jackson, TN	MKL	ASO	2011				1		1	5.304476979	0
			2004			1	3		4	1.046309666	1
			2005				1		1	0.2525884	3
			2006				2		2	0.512142908	3
			2008			3			3	0.811998084	2
Memphis Intl, TN	MEM	ASO	2010			1	2		3	0.891986394	2
			2011			1	6		7	2.178757735	0
			2012			3	2		5	1.769911504	0
			2013				2		2	0.831704579	0
			2014			1	1		2	0.907428665	0
			2004	1		1	1		3	1.275011475	5
			2005						0	0	3
			2006			1	1		2	0.942134122	2
			2007			1	2		3	1.402091921	5
			2008			1			1	0.503038352	0
Nashville Intl, TN	BNA	ASO	2009			1	6		7	3.99755578	1
			2010				2		2	1.145698475	0
			2011						0	0	1
			2012				2		2	1.146026725	2
			2013			1	2		3	1.720587982	1
			2014				1		1	0.567736661	0
Smyrna Airport, TN	MQY	ASO	2004			1	1		2	2.435282371	0
			2006						0	0	2

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			2011			1	1		2	3.327676284	0
			2012			1	6		7	10.57082452	0
			2013			1	2		3	4.345684735	0
			2014			1			1	1.494723626	0
Tri-Cities Regional TN/VA Airport, Bristol/Johnson/Kingsport, TN	TRI	ASO	2004						0	0	1
			2005						0	0	2
			2009				1		1	1.848121385	0
			2013			1			1	2.052460901	0
			2014			1	1		2	4.255319149	0
TEXAS											
Abilene Regional, TX	ABI	ASW	2008			1			1	1.141317994	0
			2009				1		1	1.47462176	0
			2012				1		1	1.590356081	1
Addison Airport, Dallas, TX	ADS	ASW	2004						0	0	1
			2005			1	1		2	1.503149097	4
			2006			1	2		3	2.240176825	0
			2007				3		3	2.275606259	1
			2008			5	6		11	7.452826993	5
			2009			6	5		11	9.65683133	1
			2010			3	6		9	9.50821404	5
			2011			3	10		13	13.80394156	12
			2012			4	7		11	11.4561853	3
			2013		1	4	11		16	16.69553603	5
			2014			5	2		7	7.448710309	7
Amarillo Intl, TX	AMA	ASW	2005						0	0	5
			2007						0	0	1
			2008			1	1		2	2.419901268	0
			2010						0	0	1

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			2011				1		1	1.298735032	0
			2012				1		1	1.560403208	0
			2013			1			1	1.622323167	0
Arlington Municipal Airport, TX	GKY	ASW	2008				1		1	0.743660296	0
			2009			1	1		2	2.404742152	0
			2011				1		1	1.284736051	1
			2012				2		2	2.82985497	1
			2014			1	1		2	2.697198959	0
Austin-Bergstrom Intl, TX	AUS	ASW	2007				1		1	0.480820087	0
			2008			1			1	0.459231705	0
			2009			1			1	0.564576229	0
			2010				2		2	1.148323161	0
			2011			2	1		3	1.665408358	0
			2012			4	2		6	3.540240736	1
			2013			1	1		2	1.128254309	0
			2014						0	0	1
Brownsville/South Padre Island Intl, TX	BRO	ASW	2004						0	0	1
			2008						0	0	2
			2014						0	0	1
Collin CO Regional at McKinney Airport, TX	TKI	ASW	2004						0	0	1
			2005						0	0	6
			2006						0	0	1
			2009			1			1	1.068775717	0
			2010			1	1		2	2.534179749	2
			2011			1			1	1.204833793	0
			2012			1			1	1.204412969	0
			2013				1		1	1.131618554	1
			2014						0	0	2

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Corpus Cristi Intl, TX	CRP	ASW	2005						0	0	1
			2007						0	0	1
			2009			1	5		6	5.94082934	1
			2010				2		2	2.055519584	0
			2011			3	2		5	4.858850396	1
			2012			1	2		3	3.249144392	0
			2013			1	1		2	2.729630135	0
			2014				2		2	2.679061793	1
Dallas Executive Airport, Dallas, TX	RBD	ASW	2007	1					1	0.694044405	0
			2014			1			1	1.964983985	0
Dallas/Fort Worth Intl, TX	DFW	ASW	2004			2	5		7	0.857514213	2
			2005			2	2		4	0.540198172	4
			2006			2	2		4	0.567804357	1
			2007				8		8	1.160491642	5
			2008	1		7	5		13	1.943986278	0
			2009			14	3		17	2.671074463	0
			2010			9	4		13	2.000418549	1
			2011			2	2		4	0.614790633	2
			2012			7	4		11	1.701611581	2
			2013			3			3	0.443130808	2
			2014			12	3		15	2.226080762	4
Dallas Love Field, TX	DAL	ASW	2004			1	1		2	0.789135187	0
			2005				1		1	0.423910233	4
			2007			1			1	0.404311579	1
			2008			5	4		9	3.89024327	0
			2009			2	11		13	7.34558728	1
			2010			2	4		6	3.563516716	8
			2011			6	3		9	5.054589567	2

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				A	B	C	D	E			
			2012			3	4		7	3.953305811	2
			2013			6	10		16	8.977063602	3
			2014			10	16		26	14.69848323	0
David Wayne Hooks Memorial Airport, Houston, TX	DWH	ASW	2004			1			1	0.458026456	0
			2005		1		1		2	0.963892584	2
			2006				1		1	0.378277777	3
			2007			1			1	0.425972388	1
			2008				4		4	1.861738026	0
			2009				2		2	0.901038898	0
			2010			3			3	1.500652784	0
			2011		1		1		2	1.056747332	0
			2012				7		7	4.258840135	0
			2013			3	8		11	5.998832954	3
			2014			8	8		16	9.427903058	4
Denton Muni, TX	DTO	ASW	2004						0	0	2
			2005						0	0	8
			2006						0	0	1
			2008				1		1	0.79867739	0
			2009						0	0	1
			2010				1		1	0.722579899	0
			2012				1		1	0.640487796	2
			2013				1		1	0.615312671	1
			2014			1	1		2	1.282067719	0
Easterwood Field, College Station, TX	CLL	ASW	2009				1		1	2.051239975	0
			2013			1	1		2	3.972352427	0
East Texas Regional, Longview, TX	GGG	ASW	2004				1		1	1.150615579	2
			2005				1		1	1.075696783	0
			2006						0	0	7

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			2007						0	0	3
			2008				3		3	3.25164479	0
			2009				3		3	3.592341129	0
			2010			1	1		2	2.301231159	0
			2011			2	2		4	5.56924662	0
			2012				1		1	1.417072894	0
			2013				3		3	4.604970298	0
			2014			1	4		5	7.884072597	0
El Paso Intl, TX	ELP	ASW	2004			1			1	0.855966515	2
			2005				1		1	0.898028827	1
			2006				1		1	0.986076598	0
			2007				1		1	0.975400402	0
			2008			2	2		4	4.000120004	0
			2009				1		1	1.027622493	0
			2012			1	2		3	3.134272222	0
			2014			1	3		4	4.107113521	0
Fort Worth Alliance Airport, TX	AFW	ASW	2006						0	0	1
			2008				1		1	1.040084871	0
			2010				1		1	1.150165624	2
			2011				1		1	0.845008535	0
			2013			1			1	0.944697413	0
			2014				1		1	0.920039378	0
Fort Worth Meacham Intl, TX	FTW	ASW	2004			1	1		2	1.388156251	1
			2005						0	0	7
			2006			1	1		2	2.40442414	3
			2007			1			1	0.992733193	2
			2008			1	1		2	1.604827321	1
			2009		1	1	8		10	8.164931619	0

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			2010			1	1		2	2.331899215	0
			2011				1		1	1.339423244	0
			2012			1	3		4	4.725004725	1
			2013				2		2	2.238839386	0
			2014			2	3		5	5.2227503	0
Fort Worth Spinks Airport, TX	FWS	ASW	2011			1			1	1.787310098	0
			2012				2		2	3.317244697	0
			2013			1			1	1.730014013	0
			2014			1			1	1.655409879	0
George Bush Intercontinental/Houston Airport, Houston, TX	IAH	ASW	2004						0	0	1
			2005			2	2		4	0.724829393	1
			2006				2		2	0.334999397	0
			2007						0	0	1
			2008			3	3		6	1.009886792	0
			2009			1	1		2	0.369959304	0
			2010			8	1		9	1.693202919	0
			2011			9			9	1.691344638	0
			2012			4			4	0.77308878	0
			2013			2			2	0.396875006	0
			2014			2	2		4	0.793805145	1
Georgetown Muni, TX	GTU	ASW	2009			1			1	1.570203812	0
			2010						0	0	1
			2012			1	2		3	4.447805008	5
			2013						0	0	1
			2014				1		1	1.368382162	2
Grand Prairie Muni, TX	GPM	ASW	2008			1			1	0.988630746	0
			2009				1		1	1.212400432	0
			2011						0	0	1

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			2012				2		2	3.007925885	0
			2013				2		2	2.911038659	0
			2014				1		1	1.412828483	0
Laredo Intl, TX	LRD	ASW	2005			1			1	1.641039106	3
			2006						0	0	2
			2009				1		1	2.060835875	0
			2010			1			1	1.734454948	0
			2011				1		1	1.479465025	0
			2012				2		2	2.227990241	0
			2013			2	2		4	3.577849534	0
			2014			1			1	0.712976892	0
Lone Star Executive, Houston, TX	CXO	ASW	2010			1	1		2	2.968239834	0
			2011				3		3	5.031952901	4
			2012			3	6		9	15.71942572	4
			2013			1	1		2	3.455902682	1
			2014			1	2		3	5.227846998	0
Lubbock Preston Smith Intl, TX	LBB	ASW	2004			1			1	1.237271569	4
			2005				1		1	1.013048059	1
			2006						0	0	1
			2007			2			2	2.255274523	3
			2008			1	5		6	7.717339576	1
			2009				3		3	3.878073373	0
			2010				4		4	5.005067631	0
			2011				3		3	4.014666916	1
			2012				1		1	1.491913827	1
			2013			1			1	1.319591982	0
McAllen Miller Intl, TX	MFE	ASW	2005						0	0	1
			2011			1			1	1.533319022	0

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			2012				1		1	1.604029322	0
			2013				1		1	1.722059583	1
Midland Intl, TX	MAF	ASW	2005				1		1	1.148712294	0
			2006						0	0	1
			2007				2		2	2.353134964	0
			2008			1	1		2	2.356711916	0
			2009				2		2	3.065932887	1
			2010			1	4		5	7.288204769	0
			2011			1	8		9	12.08475441	0
			2012			2	1		3	4.212654815	0
			2013			2	1		3	4.157255103	2
			2014				3		3	3.964949843	0
New Braunfels Muni, TX	BAZ	ASW	2010				2		2	N/A	0
			2011				6		6	17.86884269	1
			2012				1		1	3.530824094	0
San Angelo Regional/Mathis Field, TX	SJT	ASW	2014			1			1	0.966267598	0
San Antonio Intl, TX	SAT	ASW	2004				1		1	0.419598612	1
			2005				1		1	0.462252464	2
			2006				1		1	0.4652288	2
			2007			1	2		3	1.401856057	3
			2008			2	5		7	3.132439544	0
			2009			3	7		10	5.144006461	0
			2010			5	11		16	8.964188069	0
			2011			5	9		14	7.812369213	2
			2012			2	2		4	2.242378715	0
			2013			3	7		10	5.589808661	1
			2014			3	6		9	5.189892396	0
San Marcos Muni, TX	HYI	ASW	2012			2			2	3.302346317	0

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			2013						0	0	1
			2014						0	0	5
Scholes Intl at Galveston Airport, TX	GLS	ASW	2006			1			1	1.458597704	4
			2012			3	4		7	27.23629431	1
			2013				5		5	14.9383048	0
Southeast Texas Regional, Beaumont, TX	BPT	ASW	2005						0	0	1
			2007						0	0	2
			2009				1		1	3.702058344	0
			2010				3		3	11.65274811	0
			2011				1		1	4.57101065	1
Stinson Muni, San Antonio, TX	SSF	ASW	2007						0	0	1
			2012				1		1	0.8682289	0
			2014			1			1	1.14018585	0
Sugar Land Regional, Houston, TX	SGR	ASW	2004						0	0	1
			2007				1		1	1.155561719	0
			2012				1		1	1.425537071	0
			2013				2		2	2.884130074	3
			2014			1			1	1.3819217	3
TSTC Waco Airport, TX	CNW	ASW	2004						0	0	1
			2005						0	0	2
			2007						0	0	2
			2008			2			2	5.679236711	1
			2010				1		1	2.735603885	0
Tyler Pounds Regional, Tyler, TX	TYR	ASW	2004	1					1	1.24294628	1
			2008				1		1	1.776577601	0
			2011				1		1	2.167128988	0
			2012				1		1	2.389600459	2
			2013				3		3	7.304957631	0

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			2014				1		1	2.427891619	0
Valley International Airport, Harlingen, TX	HRL	ASW	2006				1		1	1.890323434	1
			2008			1			1	1.791665174	0
			2009						0	0	1
			2010			1	2		3	7.027736132	0
			2011				1		1	1.922485389	0
			2012				6		6	12.59181532	1
			2014			1			1	2.289691807	0
Victoria Regional, TX	VCT	ASW	2010				1		1	2.282740201	0
			2012				2		2	3.521002782	0
			2013			1	6		7	12.91203217	1
			2014				10		10	18.30563081	4
Waco Regional, TX	ACT	ASW	2006			1			1	2.707312451	1
			2007				1		1	2.7335101	0
			2009			1			1	3.221649485	0
			2010				2		2	7.743234349	2
			2011				2		2	6.342360627	1
			2012				1		1	2.985341971	3
			2013				2		2	5.593936173	1
			2014						0	0	2
William P Hobby Airport, Houston, TX	HOU	ASW	2004			2			2	0.812153058	2
			2005						0	0	2
			2006						0	0	7
			2007				4		4	1.666361167	2
			2008			4	5		9	4.024828721	0
			2009			5	4		9	4.404876688	0
			2010	1		7	10		18	8.944366043	0
			2011			2	2		4	1.98600857	0

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			2012			11	3		14	7.09924748	1
			2013			4	3		7	3.455749132	1
			2014			5	6		11	5.328657033	0
UTAH											
Ogden-Hinckley Airport, Ogden, UT	OGD	ANM	2006				2		2	1.669017199	0
			2007						0	0	2
			2009				1		1	1.126367128	0
			2010				1		1	1.283054697	0
			2011			2	2		4	5.871818209	0
			2012				2		2	3.114440102	0
			2013			2			2	2.939576995	0
Provo Muni, UT	PVU	ANM	2006	1		1	2		4	2.412006971	4
			2007				2		2	1.49932905	2
			2008				3		3	2.433780879	0
			2009						0	0	1
			2010			4	5		9	10.83567103	0
			2011				2		2	3.062927853	0
			2012		1		4		5	6.674854488	0
			2013				1		1	1.397194434	0
Salt Lake City Intl, UT	SLC	ANM	2004						0	0	5
			2005			1	1		2	0.447501376	4
			2006			3	1		4	0.938196318	1
			2007				1		1	0.236800167	2
			2008				4		4	0.993976502	0
			2009				5		5	1.336884097	0
			2010			8	4		12	3.271671415	0
			2011			8	5		13	3.563215555	5
			2012			2	3		5	1.515045921	2

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			2013			2	4		6	1.812645012	4
			2014			6	6		12	3.691001646	3
VERMONT											
Burlington Intl, VT	BTV	ANE	2004						0	0	1
			2005				1		1	0.910788287	1
			2006						0	0	3
			2007				1		1	1.03117234	1
			2008			1	1		2	2.100619683	0
			2009			2	1		3	3.955435428	0
			2011			1	3		4	5.194063186	0
			2012			3	1		4	5.196492368	0
			2013			4	4		8	10.83276913	0
			2014				1		1	1.35000135	0
VIRGINIA											
Lynchburg Regional/Preston Glenn Field, VA	LYH	AEA	2008			1			1	1.615326215	0
Manassas Regional/Harry P. Davis Field, VA	HEF	AEA	2004						0	0	1
			2006						0	0	1
			2007						0	0	2
			2008				1		1	0.871383757	0
			2010				1		1	1.072432061	0
			2014				13		13	16.17096441	0
Newport News/Williamsburg Intl, Newport News, VA	PHF	AEA	2004				1		1	0.43457288	0
			2005						0	0	1
			2010				1		1	0.981479482	0
			2011				2		2	1.845989127	0
			2012				1		1	0.950064604	0
			2013			2	1		3	3.122625504	0

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			2014				5		5	6.369913624	2
Norfolk Intl, VA	ORF	AEA	2004						0	0	1
			2005			1			1	0.807852325	1
			2007				1		1	0.735029291	2
			2008				1		1	0.851556646	0
			2010				3		3	3.244330532	0
			2011			3	3		6	6.521172072	0
			2012			2	4		6	6.882391402	1
			2013			1	1		2	2.453054666	0
			2014			1	1		2	2.575726355	0
Richmond Intl, VA	RIC	AEA	2004						0	0	1
			2008				1		1	0.818632066	0
			2009				3		3	2.779244601	0
			2010				3		3	2.92851495	1
			2011				2		2	1.91647981	0
			2012				1		1	1.004934227	0
			2013			1	2		3	3.053714844	0
			2014			1	1		2	2.044070152	1
Roanoke Regional/Woodrum Field, VA	ROA	AEA	2008				1		1	1.452517212	0
			2013				2		2	4.212033781	0
VIRGIN ISLANDS											
Cyril E King Airport, Charlotte Amalie, VI	STT	ASO	2007	1					1	1.179273096	0
			2010			1			1	1.329221608	0
WASHINGTON											
Bellingham Intl, WA	BLI	ANM	2006				1		1	1.330300249	0
			2008			1			1	1.505230677	0
			2013						0	0	1
Boeing Field/King CO Intl, Seattle, WA	BFI	ANM	2004			1			1	0.327760315	0

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Runway Incursion Data for 2004 through 2014 by Airport (Sorted by State)

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Airport, City	**Code**	**Region**	**Fiscal Year**	**A**	**B**	**C**	**D**	**E**	**Total RIs**	**Annual RI Rate**	**Other Events, Non-RIs**
			2005	1			2		3	1.005843953	4
			2006						0	0	1
			2008				1		1	0.328333902	0
			2009				2		2	0.748900988	0
			2010				2		2	0.769488252	0
			2011			1			1	0.415451471	1
			2012			1	1		2	1.007962907	0
			2013			3	3		6	3.308519438	0
			2014			2	1		3	1.657687526	2
Felts Field, Spokane, WA	SFF	ANM	2005						0	0	1
			2006		1				1	1.528047308	1
			2007				2		2	2.763270607	0
			2008			1			1	1.511099022	1
			2009			1			1	1.51643819	0
			2011			1			1	1.718508335	0
Grant CO Intl, Moses Lake, WA	MWH	ANM	2006						0	0	2
			2007						0	0	3
			2009			1	1		2	2.899349096	1
			2010			1	1		2	3.425830764	0
			2011			1			1	1.761152498	0
Olympia Regional, WA	OLM	ANM	2008						0	0	1
			2009				1		1	1.452939296	0
			2010						0	0	1
			2011		1		1		2	4.317789292	0
			2012			1			1	1.609347088	0
Pearson Field, Vancouver, WA	VUO	ANM	2011				3		3		1
Renton Muni, WA	RNT	ANM	2004						0	0	2
			2007				1		1	1.057194207	0

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			2009			1	1		2	2.401594659	0
			2010				1		1	1.24094113	6
			2013				2		2	2.131400863	0
			2014			1	2		3	3.046087301	1
Seattle-Tacoma Intl, WA	SEA	ANM	2004				2		2	0.558812189	3
			2005			1			1	0.288397204	1
			2006				2		2	0.589450603	3
			2007				3		3	0.871201561	10
			2008			5	2		7	1.989229742	1
			2009			4	2		6	1.871730321	2
			2010			6	3		9	2.872480994	7
			2011			7	1		8	2.536622487	2
			2012			2	2		4	1.281776029	1
			2013			3	4		7	2.235700301	0
			2014			5	1		6	1.804712103	3
Snohomish CO (Paine Field), Everett, WA	PAE	ANM	2004						0	0	2
			2005						0	0	3
			2006				1		1	0.703809014	1
			2007				1		1	0.758518159	2
			2008			1	2		3	2.112780207	0
			2009			7	5		12	10.5173668	0
			2010			1	2		3	2.684491691	1
			2011				1		1	0.904150957	2
			2012			2	1		3	2.674535745	0
			2013			1	6		7	6.688260192	1
			2014			1	4		5	4.379280747	2
Spokane Intl, WA	GEG	ANM	2007				1		1	1.003159954	0
			2008			1			1	1.010386776	0

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				A	B	C	D	E			
			2010			1	1		2	2.524328213	0
			2011				1		1	1.306438127	0
			2012			1	2		3	4.401989699	0
			2013				1		1	1.548179341	2
			2014						0	0	1
Tacoma Narrows Airport, WA	TIW	ANM	2008						0	0	1
			2009			1	1		2	3.729186478	0
			2011				1		1	1.823420007	0
			2013				1		1	2.618692225	1
Tri-Cities Airport, Pasco, WA	PSC	ANM	2006				1		1	1.65722051	1
			2008			2	2		4	6.80063926	0
			2009				1		1	2.302078777	0
			2010			1	1		2	4.312017593	1
			2011				1		1	1.913106694	0
			2012			1			1	1.907778011	0
			2013				2		2	4.117852951	0
Walla Walla Regional, WA	ALW	ANM	2009				2		2	6.499415053	0
			2010			1	1		2	7.513712525	2
			2012				1		1	4.102564103	1
			2013				1		1	3.689764593	1
			2014			1	2		3	12.14820814	0
Yakima Air Terminal/McAllister Field, WA	YKM	ANM	2004						0	0	2
			2005						0	0	2
			2007						0	0	3
			2009				2		2	4.073236798	2
			2012						0	0	1
			2013				2		2	5.657548584	0

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WEST VIRGINIA											
Harrison/Marion Regional, Clarksburg, WV	CKB	AEA	2004						0	0	1
			2013			1			1	2.85689798	0
			2014				1		1	3.755445396	0
Mid-Ohio Valley Regional, Parkersburg, WV	PKB	AEA	2007						0	0	1
			2008			1	1		2	5.896226415	0
Tri-State/Milton J. Ferguson Field, Huntington, WV	HTS	AEA	2007						0	0	2
			2010				1		1	5.800127603	0
			2011						0	0	1
			2012				1		1	6.306760848	0
Wheeling Ohio CO Airport, WV	HLG	AEA	2012			1	1		2	4.599710218	0
Yeager Airport, Charleston, WV	CRW	AEA	2007						0	0	2
			2012						0	0	1
			2013			1			1	2.024742352	0
WISCONSIN											
Austin Straubel Intl, Green Bay, WI	GRB	AGL	2004						0	0	1
			2005						0	0	1
			2007						0	0	1
			2008			1			1	1.130940264	0
			2011				2		2	2.782841002	0
			2012			1			1	1.502336133	0
			2013			1			1	1.953735542	0
			2014				1		1	2.375353334	0
Central Wisconsin Airport, Mosinee, WI	CWA	AGL	2007			1			1	4.06570174	0
			2008				1		1	4.49943757	0
Chippewa Valley Regional, Eau Claire, WI	EAU	AGL	2007						0	0	3
			2009				1		1	3.166561115	1
			2012				1		1	3.72675437	0

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			2014				1		1	4.585683496	0
Dane CO Regional-Truax Field, Madison, WI	MSN	AGL	2004		1				1	0.741570201	3
			2005			1			1	0.835854829	1
			2006				1		1	0.880173218	1
			2007				1		1	0.797906294	5
			2008			2	2		4	3.530637103	0
			2009			3	3		6	6.053146627	0
			2010			2	1		3	3.084262039	0
			2011			2	2		4	4.74535252	1
			2012			4	5		9	10.60657844	1
			2013			1	2		3	3.574577604	0
			2014			3	1		4	4.963702922	0
General Mitchell Intl, Milwaukee, WI	MKE	AGL	2004				3		3	1.413194526	0
			2005			1	1		2	0.909095041	3
			2006				3		3	1.457747197	15
			2007			2	8		10	4.991215461	17
			2008	1		6	7		14	7.247277094	1
			2009			5	3		8	4.865469761	0
			2010			3	4		7	3.693405161	2
			2011			3	1		4	2.198128294	2
			2012	1		3	1		5	3.53384362	2
			2013				1		1	0.830033948	0
			2014			2	1		3	2.597874938	1
Kenosha Regional, WI	ENW	AGL	2005						0	0	1
			2010				3		3	5.953325925	0
			2011				2		2	4.14027243	0
			2014				2		2	4.011392354	0
La Crosse Muni, WI	LSE	AGL	2005						0	0	1

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			2010			1			1	3.83494401	1
			2013			1			1	5.034232783	0
			2014				1		1	5.296890725	0
Lawrence J Timmerman Airport, Milwaukee, WI	MWC	AGL	2009				1		1	2.707752295	0
			2011				1		1	3.694945315	0
			2014				1		1	3.147425406	0
Outagamie CO Regional, Appleton, WI	ATW	AGL	2004				1		1	1.926893655	0
			2005						0	0	1
			2006						0	0	4
			2007						0	0	4
			2008				2		2	4.624277457	1
			2009				1		1	2.888170055	2
			2011	1					1	2.836316193	0
			2013						0	0	1
Southern Wisconsin Regional, Janesville, WI	JVL	AGL	2006				3		3	5.458018739	0
			2008			1			1	2.140319336	0
Waukesha CO Airport, WI	UES	AGL	2004				2		2	2.223111467	0
			2007				1		1	1.678274734	4
			2008						0	0	1
			2009			1	1		2	3.259293059	0
			2011			1			1	1.760253477	1
Wittman Regional, Oshkosh, WI	OSH	AGL	2004			1	1		2	1.880423848	1
			2006				1		1	1.091977243	1
			2007						0	0	2
			2008			1	2		3	3.678499172	0
			2009	1		1	1		3	3.280050731	0
			2010				3		3	3.977566525	4
			2011				1		1	1.369187798	0

NOTE: *In 2007, the FAA changed the way we counted total runway incursions to align with our international partners. At that point, we started including – under Category "D" – runway incursion events that did not involve another vehicle/aircraft. Prior to late 2007, those events were not included in this data set.*

N/A: *The FAA does not maintain operations counts for system performance purposes for these airports. Therefore, the runway incursion rate is not available.*

				SEVERITY							
Airport, City	**Code**	**Region**	**Fiscal Year**	**A**	**B**	**C**	**D**	**E**	**Total RIs**	**Annual RI Rate**	**Other Events, Non-RIs**
WYOMING											
Cheyenne Regional/Jerry Olsen Field, WY	CYS	ANM	2005						0	0	1
Jackson Hole Airport, Jackson, WY	JAC	ANM	2004	1					1	3.191217769	3
			2005						0	0	3
			2007						0	0	3
			2008				1		1	3.228618474	1
			2009				1		1	3.431708991	0
			2010				1		1	3.838034926	0
			2011			1			1	3.927112787	0
			2013						0	0	1
			2014				1		1	4.045798438	0
Natrona CO Intl, Casper, WY	CPR	ANM	2006						0	0	1
			2007						0	0	1
			2008			1	2		3	7.713668621	0
			2009			2			2	5.311661753	0
			2011			1			1	2.610080129	0
			2012			1			1	2.591076333	0
			2013				1		1	2.314493357	0
			2014			1	4		5	13.58991085	2

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Notes

U.S. Department of Transportation
Federal Aviation Administration

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Air Traffic Organization
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