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Runway Incursion Mitigation Fiscal Year 2023 Annual Summary Report

May 2024

Final Report

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16. Abstract In fiscal year (FY) 2012, the Federal Aviation Administration (FAA) Office of Airports (ARP) initiated a research study to identify and geographically locate areas at airports with nonstandard taxiway geometry. This research was advanced because an earlier study (Legarreta, 2012) had shown nonstandard taxiway geometries to be associated with a higher prevalence of runway incursions. The FAA defines a runway incursion (RI) as “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” (FAA, 2015). These occurrences include wrong runway landings and takeoffs. This research effort developed a geographic information system (GIS) database of approximately 520 airports with civilian air traffic control towers. For each airport, the location of nonstandard geometries, runway incursions, airfield hotspot areas, airport diagrams, and other airport-related information is identified. This research study identified 140 airfield locations with high incidences of RIs using data from October 1, 2007, to September 30, 2013. As a result, a 15- to 20-year improvement program, known as the Runway Incursion Mitigation (RIM) program, launched in FY2015. The goal of the program was to mitigate airfield locations with high incidences of RIs. A subset of the 140 locations identified was then validated for inclusion in the RIM program and prioritized for mitigation. The RIM program is updated annually using the GIS airport database to identify construction-related changes to airfield layout and their impacts on taxiway geometries, the airfield location of new RIs, and the status of airfield locations prioritized for mitigation. This report summarizes the status of the RIM program through FY2023. In 2023, the program georeferenced 1,330 RIs; added 62 nonstandard geometry locations; prioritized 16 locations for mitigation; and identified 13 locations as mitigated. Since the program’s initiation, 16,521 RIs have been georeferenced at airports along with more than 6,695 nonstandard geometry locations. In addition, 230 airfield locations were prioritized for mitigation, and 100 of these locations have been mitigated. For mitigated locations and incursion data through calendar year 2022, the incursion rate has been reduced by 69 percent.					
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LIST OF ACRONYMS

AC	Advisory Circular
ARP	Office of Airports
ATIS	Automated Traffic Information System
CY	Calendar year
EB	Engineering Brief
FAA	Federal Aviation Administration
FY	Fiscal year
GIS	Geographic information system
HQ	Headquarters
HS	Hot Spot
ILS	Instrument Landing System
NOTAM	Notice to Air Missions
NPIAS	National Plan of Integrated Airport Systems
PD	Pilot deviation
PTG	Problematic taxiway geometry
RDM	RIM Data Management
REIL	Runway end identifier light
RI	Runway incursion
RIM	Runway incursion mitigation
RWY	Runway
TWY	Taxiway
V/PD	Vehicle/pedestrian deviation

LIST OF FEDERAL AVIATION ADMINISTRATION LOCATION IDENTIFIER AIRPORT
CODES USED IN THIS REPORT

ABQ	Albuquerque International Sunport, Albuquerque, New Mexico
ACT	Waco Regional Airport, Waco, Texas
ADS	Addison Airport, Dallas, Texas
APA	Centennial Airport, Denver, Colorado
APC	Napa County Airport, Napa, California
ARR	Aurora Municipal Airport, Chicago/Aurora, Illinois
ASE	Aspen-Pitkin County Airport/Sardy Field, Aspen, Colorado
ATL	Hartsfield-Jackson Atlanta International Airport, Atlanta, Georgia
AZO	Kalamazoo/Battle Creek International, Kalamazoo, Michigan
BET	Bethel Airport, Bethel, Alaska
BFI	Boeing Field/King County International Airport, Seattle, Washington
BJC	Rocky Mountain Metropolitan Airport, Denver, Colorado
BOI	Boise Air Terminal/Gowen Field Airport, Boise, Idaho
BOS	General Edward Lawrence Logan International Airport, Boston, Massachusetts
BTV	Burlington International Airport, Burlington, Vermont
BUR	Bob Hope Airport, Burbank, California
CAK	Akron-Canton Regional Airport, Akron, Ohio
CCR	Buchanan Field Airport, Concord, California
CHD	Chandler Municipal Airport, Chandler, Arizona
CLE	Cleveland Hopkins International Airport, Cleveland, Ohio
CLL	Easterwood Field Airport, College Station, Texas
CLT	Charlotte/Douglas International Airport, Charlotte, North Carolina
CMA	Camarillo Airport, Camarillo, California
CMI	University of Illinois-Willard Airport, Champaign-Urbana, Illinois
CNO	Chino Airport, Chino, California
CRG	Jacksonville Executive at Craig Airport, Jacksonville, Florida
CRP	Corpus Christi International Airport, Corpus Christi, Texas
CRQ	McClellan-Palomar Airport, Carlsbad, California
CSG	Columbus Airport, Columbus, Georgia
CXO	Conroe-North Houston Regional Airport, Houston, Texas
DAB	Daytona Beach International Airport, Daytona Beach, Florida
DAL	Dallas Love Field Airport, Dallas, Texas
DCA	Ronald Reagan Washington National Airport, Washington, DC
DEN	Denver International Airport, Denver, Colorado
DSM	Des Moines International Airport, Des Moines, Iowa
DVT	Phoenix Deer Valley Airport, Phoenix, Arizona
DWH	David Wayne Hooks Memorial Airport, Houston, Texas
EWR	Newark Liberty International Airport, Newark, New Jersey
FAI	Fairbanks International Airport, Fairbanks, Alaska
FAT	Fresno Yosemite International Airport, Fresno, California
FCM	Flying Cloud Airport, Minneapolis, Minnesota
FDK	Frederick Municipal Airport, Frederick, Maryland
FFZ	Falcon Field Airport, Mesa, Arizona
FRG	Republic Airport, Farmingdale, New York

FTY	Fulton County Airport-Brown Field, Atlanta, Georgia
FWA	Fort Wayne International Airport, Fort Wayne, Indiana
FXE	Fort Lauderdale Executive Airport, Fort Lauderdale, Florida
GCN	Grand Canyon National Park Airport, Grand Canyon, Arizona
GLS	Scholes International Airport, Galveston, Texas
HIO	Portland-Hillsboro Airport, Portland, Oregon
HLN	Helena Regional Airport, Helena, Montana
HND	Henderson Executive Airport, Las Vegas, Nevada
HNL	Daniel K. Inouye International Airport, Honolulu, Hawaii
HOU	William P. Hobby Airport, Houston, Texas
HUF	Terre Haute Regional Airport, Terre Haute, Indiana
HWD	Hayward Executive Airport, Hayward, California
IAG	Niagara Falls International Airport, Niagara Falls, New York
IDA	Idaho Falls Regional Airport, Idaho Falls, Idaho
ISM	Kissimmee Gateway Airport, Orlando, Florida
IWA	Phoenix-Mesa Gateway Airport, Phoenix, Arizona
JLN	Joplin Regional Airport, Joplin, Missouri
JNU	Juneau International Airport, Juneau, Alaska
LAF	Purdue University Airport, Lafayette, Indiana
LAS	Harry Reid International Airport, Las Vegas, Nevada
LAX	Los Angeles International Airport, Los Angeles, California
LGB	Long Beach Airport/Daugherty Field, Long Beach, California
LIT	Adams Field Airport, Little Rock, Arizona
LOU	Bowman Field Airport, Louisville, Kentucky
LVK	Livermore Municipal Airport, Livermore, California
MAF	Midland International Air and Space Port, Midland, Texas
MDW	Chicago Midway International Airport, Chicago, Illinois
MEM	Memphis International Airport, Memphis, Tennessee
MFE	McAllen Miller International Airport, McAllen, Texas
MHT	Manchester-Boston Regional Airport, Manchester, New Hampshire
MIA	Miami International Airport, Miami, Florida
MIC	Crystal Airport, Minneapolis, Minnesota
MKC	Charles B. Wheeler Downtown Airport, Kansas City, Missouri
MLI	Quad City Airport, Moline, Illinois
MLU	Monroe Regional Airport, Monroe, Louisiana
MQY	Smyrna Airport, Smyrna, Tennessee
MRI	Merrill Field Airport, Anchorage, Alaska
MYF	Montgomery-Gibbs Executive Airport, San Diego, California
NEW	Lakefront Airport, New Orleans, Louisiana
OAK	Albert J. Ellis Airport, Jacksonville, North Carolina
OPF	Miami-Opa Locka Executive Airport, Miami, Florida
ORD	Chicago O'Hare International Airport, Chicago, Illinois
ORL	Orlando Executive Airport, Orlando, Florida
PAO	Palo Alto Airport, Palo Alto, California
PBI	Palm Beach International Airport, West Palm Beach, Florida
PDK	DeKalb-Peachtree Airport, Atlanta, Georgia

PHL	Philadelphia International Airport, Philadelphia, Pennsylvania
PHX	Phoenix Sky Harbor International Airport, Phoenix, Arizona
PIE	St. Pete-Clearwater International Airport, St. Petersburg-Clearwater, Florida
PNS	Pensacola International Airport, Pensacola, Florida
POC	Brackett Field, LaVerne, California
PRC	Ernest A. Love Field Airport, Prescott, Arizona
PSP	Palm Springs International Airport, Palm Springs, California
PWM	Portland International Jetport, Portland, Maine
RHV	Reid-Hillview Airport of Santa Clara County, San Jose, California
RNO	Reno/Tahoe International Airport, Reno, Nevada
SAT	San Antonio International Airport, San Antonio, Texas
SBA	Santa Barbara Municipal Airport, Santa Barbara, California
SDL	Scottsdale Airport, Scottsdale, Arizona
SDM	Brown Field Municipal Airport, San Diego, California
SEA	Seattle-Tacoma International Airport, Seattle, Washington
SFB	Orlando Sanford International Airport, Orlando, Florida
SFO	San Francisco International Airport, San Francisco, California
SJC	Norman Y. Mineta San Jose International Airport, San Jose, California
SLC	Salt Lake City International Airport, Salt Lake City, Utah
SMO	Santa Monica Municipal Airport, Santa Monica, California
SNA	John Wayne-Orange County Airport, Santa Ana, California
SPI	Abraham Lincoln Capital Airport, Springfield, Illinois
SRQ	Sarasota/Bradenton International Airport, Sarasota/Bradenton, Florida
STS	Charles M. Schulz-Sonoma County Airport, Santa Rosa, California
TEB	Teterboro Airport, Teterboro, New Jersey
TIW	Tacoma Narrows Airport, Tacoma, Washington
TMB	Miami Executive Airport, Miami, Florida
TOA	Zamperini Field, Torrance, California
TUL	Tulsa International Airport, Tulsa, Oklahoma
TUS	Tucson International Airport, Tucson, Arizona
TYR	Tyler Pounds Regional Airport, Tyler, Texas
UAO	Aurora State Airport, Aurora, Oregon
UES	Waukesha County Airport, Waukesha, Wisconsin
VGT	North Las Vegas Airport, Las Vegas, Nevada
VNY	Van Nuys Airport, Van Nuys, California

EXECUTIVE SUMMARY

In fiscal year (FY) 2012, the Federal Aviation Administration (FAA) Office of Airports (ARP) initiated a research study to identify and geographically locate areas at airports with nonstandard taxiway geometry. This research was advanced because an earlier study (Legarreta, 2012) had shown nonstandard taxiway geometries to be associated with a higher prevalence of runway incursions. The FAA defines a runway incursion (RI) as “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” (FAA, 2015). These occurrences include wrong runway landings and takeoffs. This research effort developed a geographic information system (GIS) database of approximately 520 airports with civilian air traffic control towers. For each airport, the location of nonstandard geometries, RIs, airfield hotspot areas, airport diagrams, and other airport-related information is identified. This research study identified 140 airfield locations with high incidences of RIs using data from October 1, 2007, to September 30, 2013. As a result, a 15- to 20-year improvement program, known as the Runway Incursion Mitigation (RIM) program, launched in FY2015. The goal of the program is to mitigate airfield locations with high incidences of runway incursions. A subset of the 140 locations identified was then validated for inclusion in the RIM program and prioritized for mitigation.

The RIM program is updated annually using the GIS airport database to identify construction-related changes to airfield layout and their impacts on taxiway geometries, the airfield location of new RIs, and the status of airfield locations prioritized for mitigation.

This report summarizes the status of the RIM program through FY2023. In FY2023, the program:

- Georeferenced 1,330 runway incursions
- Added 62 nonstandard geometry locations
- Prioritized 16 locations for mitigation
- Identified 13 locations as mitigated

Since program initiation, 16,521 RIs have been georeferenced at airports along with more than 6,695 nonstandard geometry locations. In addition, 230 airfield locations were prioritized for mitigation and 100 of these locations implemented mitigations. For mitigated locations and incursion data through calendar year (CY) 2022, the incursion rate was reduced by 69 percent.

1. INTRODUCTION

The Federal Aviation Administration (FAA) defines a runway incursion (RI) as “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” (FAA, 2015). These occurrences, including wrong runway landings and takeoffs, are a top airport safety concern for the FAA.

The FAA conducted an initial study of RIs from 1997 to 2003 resulting from a pilot deviation (PD) or vehicle/pedestrian deviation (V/PD). These incursions were then plotted on airport diagrams (Legarreta, 2012). Analysis of these incursions found that certain taxiway locations experienced far more RIs than other locations (Legarreta, 2012). Through additional research, the FAA identified taxiway geometry configurations associated with a higher incidence of RIs (Legarreta, 2012). This led the FAA Airport Engineering Division to publish Engineering Brief (EB) 75, *Incorporation of Runway Incursion Prevention into Taxiway and Apron Design*, in November 2007 (FAA, 2007). Subsequently, the updated Advisory Circular (AC) 150/5300-13, *Airport Design*, incorporated many of the airport layout recommendations from EB 75 (FAA, 2022a & b). Both documents provide guidance for airports to design taxiways in a manner to reduce confusion and increase situational awareness. Airport layouts not conforming to these recommendations could lead to confusion and, ultimately, RIs.

In fiscal year (FY) 2012, the FAA Office of Airports (ARP) initiated a research study to identify and geographically locate areas at airports with nonstandard geometry and a high incidence of RIs. This effort, detailed in the FAA report *Problematic Taxiway Geometry Study Overview* (Vitagliano, Canter, & Aland, 2018) (“PTG Report”), developed a geographic information system (GIS) database including

- 6,098 airport locations with nonstandard geometry, also known as problematic taxiway geometry (PTG) locations
- All PD and V/PD deviation RIs, including wrong runway events and surface incidents
- Airport diagrams and information
- Hot spots

The initial study and field validation process identified 140 locations with a high incidence of RIs using data from October 1, 2007, to September 30, 2013, after reviewing 5,099 RI reports. As a result, a 15- to 20-year improvement program, known as the Runway Incursion Mitigation (RIM) program, launched in FY2015. The goal of the program is to mitigate airfield locations with high incidents of RIs. A subset of the 140 locations identified was then validated for inclusion in the RIM program and prioritized for mitigation. The FAA maintains a RIM program website, accessed at https://www.faa.gov/airports/special_programs/rim/ (FAA, 2023).

2. ANNUAL DATABASE UPDATES

The FAA maintains the RIM database including all data relevant to the program from airports

with civilian air traffic control towers (towered airports) and provides a history of database updates. The following data are maintained for each airport:

- Hub Category
- General Aviation Asset Category
- Annual Operations
- Enplanements
- Title 14 Code of Federal Regulations Part 139 status (Airport Certification, 2004), herein referred to as Part 139

The current FAA airport diagram can be displayed within the database along with Form 5010 Airport Master Record data. Additionally, hot spots and their descriptions are updated every 28 days, when applicable.

The database includes all RIs and surface incidents categorized as V/PDs or PDs by the FAA Office of Runway Safety for each airport. This includes wrong runway landings and takeoffs. On an annual basis, the database incorporates new data. This update typically occurs during the second quarter of the FY and involves analysis of all RIs from the previous calendar year (CY). Reviewing the narrative in the incursion report determines the RI location. Each incursion is then georeferenced in the database.

In addition to analyzing RIs, an annual review of the layout of each airport determines if locations with previously identified nonstandard geometry characteristics have changes and/or mitigations. Locations with new nonstandard geometry characteristics are identified as well. In the PTG Report, the FAA identified 19 nonstandard taxiway geometry characteristics that lead to pilot confusion. Locations having at least one of the following 19 nonstandard geometry characteristics are categorized as PTG locations (FAA, 2013):

- Y-shaped taxiways crossing a runway
- Wrong runway events
- Wide expanses of taxi pavements entering or along a runway
- Convergence of numerous taxiway types entering a runway
- High-speed exit crossing a taxiway
- Two runway thresholds in close proximity
- Short taxiways (stubs) between runways
- Direct taxiing access to runways from ramp areas
- An aligned taxiway entering runway ends
- Nonstandard markings and/or signage placement
- Greater than three-path taxiway intersection
- Taxiway connection to V-shaped runways
- Taxiway intersects runway at other than a right angle
- Short taxi distance from ramp/apron area to a runway
- High-speed exits leading directly onto another runway
- Taxiway coinciding with the intersection of two runways
- Use of a runway as a taxiway

- Unexpected holding position marking on parallel/entrance taxiway
- Miscellaneous (e.g., nonsequential taxiway designation schemes, absence of full-length parallel taxiway, taxiway intersection along the middle third of a runway)

Once all RIs from the previous CY are georeferenced, a review of annual and cumulative RI counts for each PTG location determines which locations meet RIM program criteria. The criteria are

- (1) three or more RIs in a single CY, or
- (2) an average of one or more RIs per year during the most recent 10 years.

The analysis is limited to the most recent 10-year period to consider changes in an airport operating environment over long periods of time (e.g., operational procedures, activity profiles, fleet mix, airfield redesign).

A review of the unique characteristics of each location further narrows the locations considered for field validation. For certain locations, interpretation of incursion narratives is necessary to confirm RIM status. All RIs are georeferenced regardless of narrative description, but not all narratives provide evidence of a potential issue with taxiway geometry. For example, a lost airport vehicle may cross the same runway hold bar multiple times, generating multiple RIs for one incident. Such a location, which might technically meet RIM criteria, is not a RIM location based on the serial nature of the specific incursion incident. Short-term construction projects can cause temporary airfield hot spots that no longer apply after construction is finished. Aircraft and vehicles operating on an airfield without tower clearance provide another example of an event not related to taxiway geometry. The FAA continues to monitor these locations.

The purpose of field validation, which occurs after each annual database update, is to obtain feedback from FAA field personnel regarding locations considered for classification as RIM locations. Information obtained from the field, such as extenuating circumstances surrounding RIs (e.g., construction activity, air shows, other special events) and whether mitigations are underway, is evaluated. ARP personnel use this information to make a final determination regarding which locations to add to the RIM inventory. After final determinations, the FAA publishes the updated RIM inventory on the FAA website (FAA, 2023). Figure 1 provides a summary of the annual database update process, which typically begins in January and ends in September.

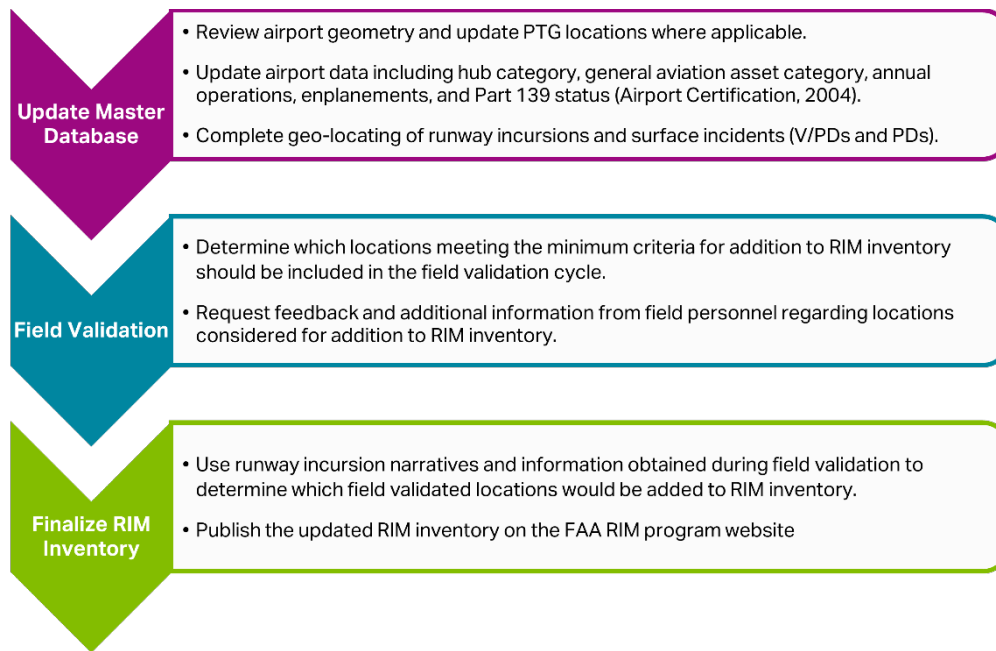


Figure 1. The RIM Database Update Process

Statistical analysis of incursion incidents at mitigated RIM locations assessed incursion rates before and after mitigation. For locations where at least one year of post-mitigation incursion data are available, analysis of incursion data through CY2022 indicates an average incursion rate before mitigation of 0.85 and an average incursion rate after mitigation of 0.26, a 69 percent reduction in incursions after mitigation (Baksh, 2024).

The FAA maintains a GIS-based module, referred to as the RIM Data Management (RDM) tool; accessed through the FAA’s Airport Data and Information Portal, also known as ADIP. This tool facilitates field and FAA headquarters (HQ) personnel in sharing information related to potential or active RIM locations, monitoring the progress of mitigation for RIM locations, and tracking the success metrics of the program. Additionally, non-FAA users, such as state aviation officials, airport sponsors, and industry consultants, have limited, read-only access to the RDM tool. The RDM tool undergoes a major update annually that reflects the previous year’s data and updates RIM Location details. Hot Spot (HS) polygons and related PTG locations, RI, and surface incident data are updated on an intermittent basis throughout the year.

2.1 The FY2015–FY2023 Program Summary

The RIM database has undergone eight annual updates since the completion of the PTG study. These updates added a total of 11,422 RIs and 594 PTG locations to the database. Nine field validation cycles coincided with these annual database updates. These cycles were completed in July 2015, December 2016, and every year in July from 2017 through 2023. These validation cycles added 141 new RIM locations. Figure 2 provides a breakdown of RIs added with each update, and Figure 3 shows the number of PTG locations added with each update. As shown, the number of PTG locations decreased by 54 in FY2019 due to the mitigation of nonstandard geometry characteristics, through other projects. The number of PTG locations increased by 263

in FY2021 due to the establishment of new numerical criteria for identifying Geocode 14 “Short taxi distance from ramp/apron area to a runway.” Analysis of data from Section 7.4 of the report *Data Gap Assessment and Exploratory Data Analysis for Runway Incursion Mitigation Program* (Baldwin and Harris, 2020) established this criterion (800 feet from non-movement area marking to runway hold line). This identified new PTG locations added to the RIM database. Figure 4 shows the counts of locations that entered the RIM inventory after each validation cycle, and the counts of RIM locations mitigated per fiscal year. This figure represents additions since the initial FY2012 study and does not take into consideration differences in yearly values that result from adjustments made to individual RIM locations (because of reevaluation of runway incursion reports) to account for changes in RIM location status. Section 2.2 provides an in-depth discussion of the most recent database update and validation cycle, which took place in 2023.

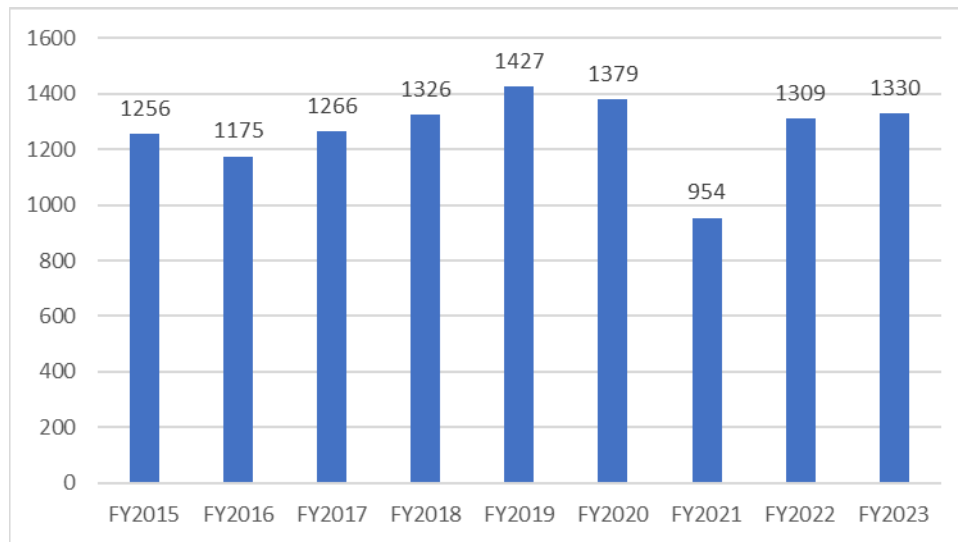


Figure 2. The RIs Added to RIM Database With Each Update

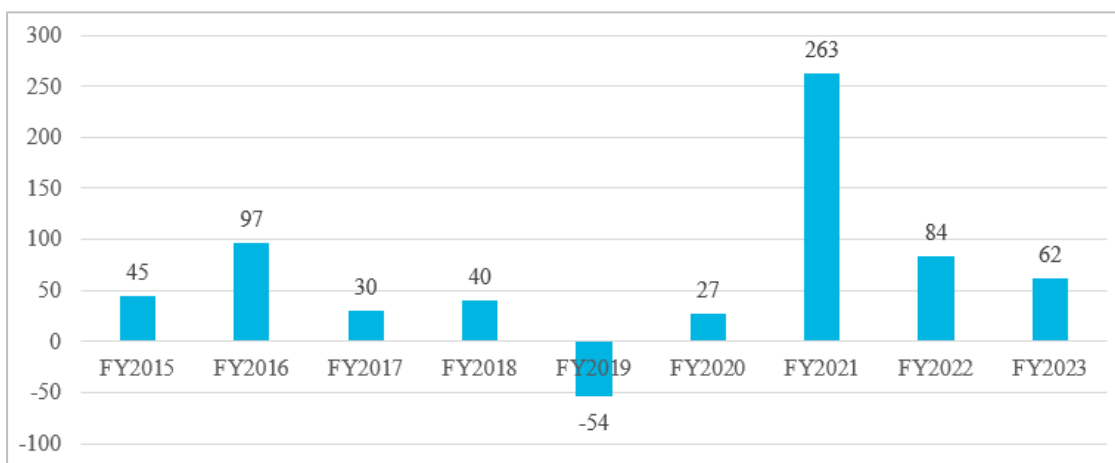


Figure 3. The PTG Locations Added to RIM Database With Each Update

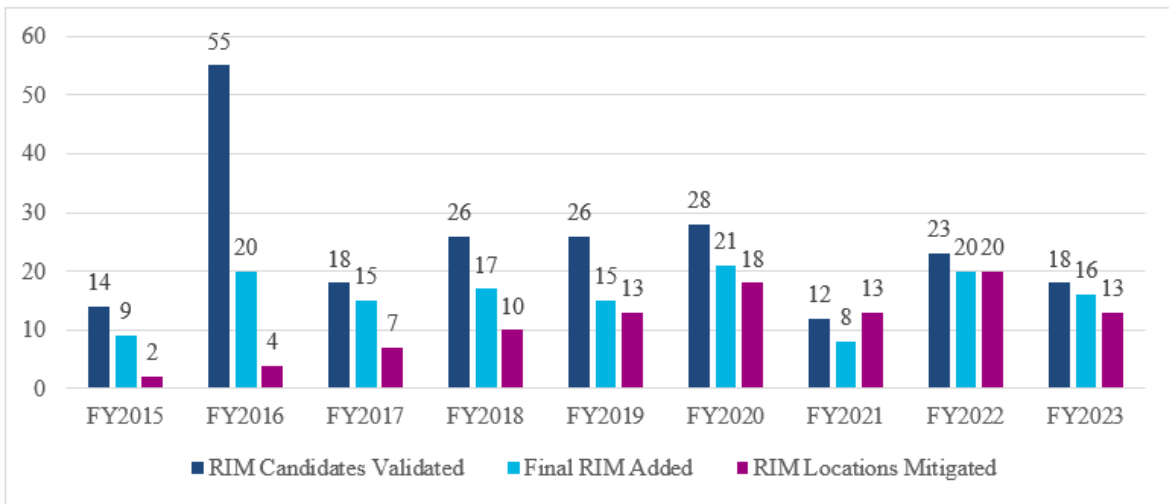


Figure 4. The RIM Locations Validated/Added/Mitigated Per FY

2.2 The FY2023 Program Update

The FY2023 RIM database update was completed in September 2023. This update analyzed and georeferenced 1,330 RIs from CY2022. This increased the overall number of RIs in the database to 16,521. These incursions occurred at 526 towered airports between FY2008 and the end of CY2022.

Analysis of RI counts identified 32 PTG locations meeting the minimum criteria for entry into the RIM inventory. Of these locations, 18 were ultimately included in the field validation/review cycle based on assessment of individual location characteristics and history. Based on information obtained during field validation, 16 locations were added to the RIM inventory in FY2023. Table 1 lists these 16 locations and provides relevant details such as location, peak year RI counts, and cumulative RI counts during the past 10 years. Due to CY2022 RI counts, two mitigated locations (indicated by an asterisk in Table 1) returned to the RIM inventory in FY2023 for additional mitigation action.

Table 1. The FY2023 New RIM Locations: Summary Data

Airport Name	Airport Identifier	Location Description	Peak CY Annual RI	Cumulative ¹ RI Count
Aurora Municipal Airport, IL	ARR	Intersection of Runway 15/33 and Runway 9/27	3	7
Aurora Municipal Airport, IL	ARR	Taxiway A at intersection with Runway 15/33 (east of runway)	4	5
Burlington International Airport, VT	BTV	Taxiway A at approach end of Runway 19	3	7
Easterwood Field Airport, TX	CLL	Holding position on Taxiway B for approach end of Runway 11	3	3

Airport Name	Airport Identifier	Location Description	Peak CY Annual RI	Cumulative ¹ RI Count
Ronald Reagan Washington National Airport, VA	DCA	Taxiway J at approach end of Runway 1	3	8
Ronald Reagan Washington National Airport, VA	DCA	Taxiway M and Taxiway G at the intersection with Runway 1/19 and Taxiway J	3	6
David Wayne Hooks Memorial Airport, TX*	DWH	Taxiway E at intersection with Runway 17R/35L	6	26
Falcon Field Airport, AZ	FFZ	Taxiway D5 at intersection with Runway 4R/22L	3	7
Fort Wayne International Airport, IN	FWA	Taxiway C2 at intersection with Runway 5/23	3	5
Portland-Hillsboro Airport, OR	HIO	Intersection of Runway 2/20 and Runway 13R/31L	4	12
Palm Beach International Airport, FL*	PBI	Holding position on parallel Taxiway L for approach end of Runway 10L	5	10
Dekalb-Peachtree Airport, GA	PDK	Taxiway G between Runway 3R/21L and 3L/21R	4	8
Portland International Jetport, ME	PWM	Holding position on parallel Taxiway C for approach end of Runway 18	3	9
Scottsdale Airport, AZ	SDL	Taxiway A16 at approach end of Runway 21	3	5
John Wayne/Orange County Airport, CA	SNA	Taxiway K between Runway 2R/20L and 2L/20R	4	11
Waukesha County Airport, WI	UES	Taxiway C3 at intersection with Taxiway C	3	4

* RIM locations were mitigated previously but then returned to RIM inventory in FY2023 for additional mitigation.

¹ Incursion count to date from the previous 10 calendar years of available RI data (CY2013–CY2023).

2.3 The RIM Inventory

At the end of FY2023, the RIM inventory consisted of 130 active RIM locations at 85 airports across all FAA regions. Several airports have more than one active RIM location. Airports with the most RIM locations are:

- Montgomery-Gibbs Executive Airport (MYF), San Diego, California – 5 RIM locations
- Chino Airport (CNO), Chino, California – 5 RIM locations

The FAA categorizes airports with the greatest impact on system performance (having 1 percent of passenger enplanements or 0.75 percent or more of the total nonmilitary itinerant operations) as core airports. Table 2 lists the Core 30 airports with current RIM locations.

Table 2. Core 30 Airports With RIM Locations

Airport Name	Airport Identifier	Number of RIM Locations
Hartsfield-Jackson Atlanta International Airport, Atlanta, GA	ATL	1
General Edward Lawrence Logan International Airport, Boston, MA	BOS	4
Ronald Reagan Washington National Airport, Arlington, VA	DCA	3
Denver International Airport, Denver, CO	DEN	1
Newark Liberty International Airport, Newark, NJ	EWB	1
Daniel K. Inouye International Airport, Honolulu, HI	HNL	3
Harry Reid International Airport, Las Vegas, NV	LAS	1
Los Angeles International Airport, Los Angeles, CA	LAX	1
Memphis International Airport, Memphis, TN	MEM	1
Miami International Airport, Miami, FL	MIA	2
Seattle-Tacoma International Airport, Seattle, WA	SEA	1
San Francisco International Airport, San Francisco, CA	SFO	1
Salt Lake City International Airport, Salt Lake City, UT	SLC	2

The complete RIM inventory as of the end of FY2023 is in Appendix A.

3. MITIGATION ANALYSIS

Once a PTG location is added to the RIM inventory, relevant stakeholders (e.g., FAA personnel, local airport sponsor) coordinate to determine the most appropriate mitigation strategies for the location, as is typical for proper airport planning and design. Upon selecting mitigation strategies, the project progresses through the typical phases of planning, environmental assessment, design, and construction. The 130 active RIM locations are in various stages of mitigation. Figure 5 provides a breakdown of RIM locations by mitigation milestone. As shown, 110 (85 percent) active RIM locations have initiated mitigation activities and are in the planning, design, or construction phases. Note that 6 of the 20 RIM locations with no project identified entered the RIM inventory in the fourth quarter of FY2023.

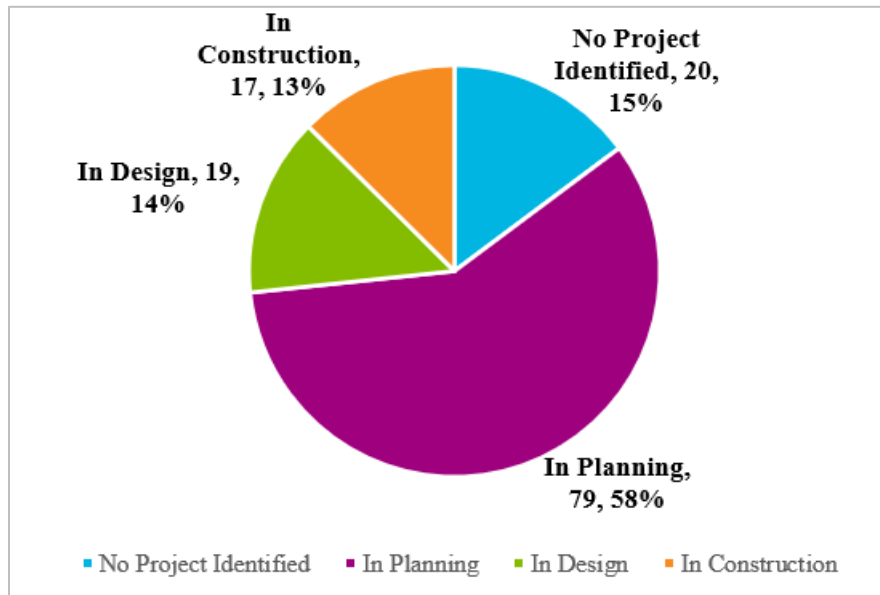


Figure 5. Status of Active RIM Locations

Airports use a variety of mitigation strategies to eliminate nonstandard geometry configurations and reduce the likelihood of pilot confusion and, ultimately, RIs. AC 150/5300-13 (FAA, 2022a) and EB 75 (FAA, 2007) provide airports with airport geometry strategies to reduce the risk of RIs. In addition to geometry improvements, airports often use a combination of mitigation strategies for RIM locations. Mitigation strategies include changes to airfield lighting, signage, markings, and/or operational procedures. Prior to 2020, pilot education was an acceptable means of mitigation; yet it has since been found not to be successful as the sole mitigation technique. Table 3 provides examples of mitigation strategies.

Table 3. Mitigation Strategy Examples (FAA, 2022a)

Mitigation Type	Mitigation Strategy Examples
Airport Geometry Changes	<ul style="list-style-type: none"> • Reconfigure taxiway to intersect runway at 90-degree angle • Relocate taxiway to eliminate direct access • Narrow the taxiway pavement entrance • Close a taxiway or runway
Lighting	<ul style="list-style-type: none"> • Install runway end identifier lights (REILs) • Install elevated or in-pavement runway guard lights
Signage	<ul style="list-style-type: none"> • Relocate signs to meet FAA standards • Adjust hold position signs to align with incoming taxiway centerline
Markings	<ul style="list-style-type: none"> • Relocate markings to meet FAA standards • Install enhanced centerline markings • Collocate instrument landing system (ILS) and hold position markings • Install runway holding position markings at runway/runway intersections

Mitigation Type	Mitigation Strategy Examples
Procedures/Operational	<ul style="list-style-type: none"> • Notify pilots of problems with correct runway selection through Automated Traffic Information System (ATIS), Notices to Air Missions (NOTAMs), and airport diagram notations • Discontinue use of runways as taxiways

FAA personnel developed procedures to confirm mitigation of RIM locations and successful mitigation techniques.

By the end of FY2023, the RIM program mitigated 100 locations. Airports used a variety of mitigation strategies to eliminate the problematic geometry characteristics or reduce their effects at these locations. Refer to Appendix B for the location descriptions of each mitigated RIM location by FY.

The RIM-mitigated locations experienced a total of 1,364 RIs prior to mitigation, compared to 101 RIs after mitigation. Because some of these locations were mitigated relatively recently, within the past 5 years, significant post-mitigation RI trending data do not yet exist. Monitoring of these locations over time determines if mitigation efforts are successful. Appendix C provides summary data for all RIM-mitigated locations.

4. CONCLUSION

The goal of the RIM program is to identify locations at towered airports with nonstandard geometry characteristics and a high occurrence of RIs, mitigate the nonstandard geometry characteristics present at these locations, and ultimately reduce the number of RIs at these locations. This program continues to be one of the most successful safety programs in the FAA.

At the end of FY2023:

- 130 active RIM locations
- 85 airports with at least 1 RIM location
- 110 locations initiated mitigation activities (planning, design, or construction phases)
- 100 mitigated locations since the June 2015 inception
- For mitigated locations and incursion data through CY2022, the incursion rate has been reduced by 69 percent
- Mitigations eliminated hot spots from the airport diagrams at 32 of these locations

The FAA continues to monitor these locations to ensure the mitigations successfully reduce the number of RIs.

FAA HQ personnel continue to monitor the progress of the program by visiting as many airports with RIM locations as feasible. Personnel from FAA HQ, the regions, and the Airports District Offices are available to provide advisory and financial assistance to airport sponsors with mitigation strategies, as the ultimate goal is to reduce RIs as much as possible and eliminate RIM locations across all airports.

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APPENDIX A—RUNWAY INCURSION MITIGATION INVENTORY

The FAA Runway Incursion Mitigation (RIM) program personnel developed this preliminary inventory of airport locations where runway incursions (RIs) have occurred and are now working with airports on mitigation strategies. The RI data collected from fiscal year (FY) 2008 to calendar year (CY) 2022 indicate airport locations where three or more peak annual RIs have occurred in a given CY or where cumulative incursion counts averaged one or more RIs per year of data analyzed. Cumulative RI counts reflect total RIs to date since FY2008 for each location validated prior to 2020. For locations validated in 2020 and later, cumulative RI counts reflect total RIs beginning 10 calendar years prior to their validation year. Table A-1 shows this information, which is subject to change as the FAA works with the airport sponsors. Bold and italic rows in Table A-1 indicate new RIM locations that were added to the inventory in FY2023. The RIM program inventory will be updated as projects proceed, and additional RI data are collected.

Table A-1. The RIM Program Inventory of Airport Locations as of September 2023

Airport Identifier	Airport Name	Location	Location Identifier	Year Added to RIM	Region	NPIAS ¹ Hub Classification	Asset Category	Part 139 ²	Cumulative RI	Peak CY Annual RI
ABQ	Albuquerque International Sunport, NM	Taxiway E at intersection with Runway 3/21	ABQ-HS3	2022	ASW	Medium	NA	Y	13	4
APA	Centennial Airport, CO	Approach end of Runway 35R	APA-07	2019	ANM	Reliever	National	N	14	4
ARR	Aurora Municipal Airport, IL	Holding position on Taxiway A3 at intersection with Runway 9/27	ARR-03	2020	AGL	Reliever	National	N	6	3
ARR	<i>Aurora Municipal Airport, IL</i>	<i>Intersection of Runway 15/33 and Runway 9/27</i>	<i>ARR-15</i>	<i>2023</i>	<i>AGL</i>	<i>Reliever</i>	<i>National</i>	<i>N</i>	<i>7</i>	<i>3</i>
ARR	<i>Aurora Municipal Airport, IL</i>	<i>Taxiway A at intersection with Runway 15/33 (east of runway)</i>	<i>ARR-17</i>	<i>2023</i>	<i>AGL</i>	<i>Reliever</i>	<i>National</i>	<i>N</i>	<i>5</i>	<i>4</i>
ASE	Aspen-Pitkin County/Sardy Field Airport, CO	Taxiway A9 at approach end of Runway 33	ASE-HS3	2019	ANM	Non-Hub Primary	NA	Y	20	4
ATL	Hartsfield-Jackson Atlanta International Airport, GA	Runway 8L/26R and Taxiways C and D intersections	ATL-HS1	2015	ASO	Large	NA	Y	17	4
AZO	Kalamazoo/Battle Creek International Airport, MI	Taxiway C at intersection with Runway 17/35 (west of runway)	AZO-02	2015	AGL	Non-Hub Primary	NA	Y	6	3
BET	Bethel Airport, AK	Intersection of Runway 12/30 and Runway 1R/19L	BET-HS1	2021	AAL	Non-Hub Primary	NA	Y	8	5

Bold and italic rows are new RIM locations that were added to the inventory in FY2023.

¹ NPIAS = National Plan of Integrated Airport Systems

² Airport Certification, Title 14 Code of Federal Regulations Part 139 (14 C.F.R § 139).

Airport Identifier	Airport Name	Location	Location Identifier	Year Added to RIM	Region	NPIAS ¹ Hub Classification	Asset Category	Part 139 ²	Cumulative RI	Peak CY Annual RI
BFI	Boeing Field/King County International Airport, WA	Holding position on Taxiway Z parallel to approach end of Runway 14R	BFI-HS1	2020	ANM	Non-Hub Primary	NA	Y	8	3
BJC	Rocky Mountain Metropolitan Airport, CO	Approach end of Runway 30R	BJC-02	2021	ANM	Reliever	National	Y	16	4
BJC	Rocky Mountain Metropolitan Airport, CO	Runway 3 at intersection with Runway 12R/30L (south of runway)	BJC-HS3	2020	ANM	Reliever	National	Y	14	5
BOI	Boise Air Terminal/Gowen Field, ID	Taxiway J between Runway 10R approach end and 10L approach hold	BOI-01	2018	ANM	Small	NA	Y	25	9
BOI	Boise Air Terminal/Gowen Field, ID	Approach hold on Taxiway J/A at approach end of Runway 10L and Taxiway W at approach end of Runway 10L	BOI-HS1	2019	ANM	Small	NA	Y	16	3
BOS	General Edward Lawrence Logan International Airport, MA	Intersection of Runways 4R/22L and 14/32	BOS-47	2015	ANE	Large	NA	Y	9	3
BOS	General Edward Lawrence Logan International Airport, MA	Intersection of Runways 15L/33R and 4L/22R	BOS-HS1	2015	ANE	Large	NA	Y	15	3
BOS	General Edward Lawrence Logan International Airport, MA	Intersection of Runway 4L approach end and Taxiways E and K	BOS-HS3	2015	ANE	Large	NA	Y	31	5
BOS	General Edward Lawrence Logan International Airport, MA	Intersections of Taxiways C and D, and Runways 15R/33L and 9/27	BOS-HS4	2022	ANE	Large	NA	Y	19	4

Airport Identifier	Airport Name	Location	Location Identifier	Year Added to RIM	Region	NPIAS ¹ Hub Classification	Asset Category	Part 139 ²	Cumulative RI	Peak CY Annual RI
BTV	<i>Burlington International Airport, VT</i>	<i>Taxiway A at approach end of Runway 19</i>	<i>BTV-06</i>	<i>2023</i>	<i>ANE</i>	<i>Small</i>	<i>NA</i>	<i>Y</i>	<i>7</i>	<i>3</i>
BUR	Bob Hope Airport, CA	Holding positions for Runways 8/26 and 15/33 at northwest corner of air carrier ramp (non-movement area)	BUR-HS1	2019	AWP	Medium	NA	Y	12	4
CAK	Akron-Canton Regional Airport, OH	Taxiways H and J at intersection with Runway 1/19 (west of runway)	CAK-HS1	2020	AGL	Non-Hub Primary	NA	Y	16	4
CCR	Buchanan Field Airport, CA	Taxiway B at approach end of Runway 32R	CCR-HS4	2016	AWP	Non-Hub Primary	NA	Y	20	4
CHD	Chandler Municipal Airport, AZ	Approach end of Runway 22L	CHD-12	2021	AWP	Reliever	Regional	N	9	4
CLL	<i>Easterwood Field Airport, TX</i>	<i>Holding position on Taxiway B for approach end of Runway 11</i>	<i>CLL-HS1</i>	<i>2023</i>	<i>ASW</i>	<i>Non-Hub Primary</i>	<i>NA</i>	<i>Y</i>	<i>3</i>	<i>3</i>
CMA	Camarillo Airport, CA	Taxiway A at approach end of Runway 26	CMA-01	2015	AWP	Reliever	National	N	16	5
CMI	University Of Illinois/Willard Airport, IL	Complex intersection of Taxiways A, A2, B, C, D, D1, and E	CMI-HS1	2022	AGL	Non-Hub Primary	NA	Y	17	3
CNO	Chino Airport, CA	Taxiway P between Runway 26R approach end and 26L	CNO-05	2015	AWP	Reliever	Regional	N	15	4
CNO	Chino Airport, CA	Taxiway P at approach end of Runway 26R (north of runway)	CNO-10	2017	AWP	Reliever	Regional	N	29	8
CNO	Chino Airport, CA	Runway 26L approach end	CNO-19	2015	AWP	Reliever	Regional	N	21	6
CNO	Chino Airport, CA	Taxiway L between Runways 3/21 and 8R/26L	CNO-HS2	2018	AWP	Reliever	Regional	N	8	5

Airport Identifier	Airport Name	Location	Location Identifier	Year Added to RIM	Region	NPIAS ¹ Hub Classification	Asset Category	Part 139 ²	Cumulative RI	Peak CY Annual RI
CNO	Chino Airport, CA	Intersections of Taxiways D, K, and L and Runways 8L/26R and 3/21	CNO-HS4	2016	AWP	Reliever	Regional	N	27	5
CRG	Jacksonville Executive At Craig Airport, FL	Intersections of Taxiways C, E, and F entering Runways 5/23 and 14/32	CRG-HS1	2020	ASO	Reliever	Regional	N	15	4
CRQ	McClellan-Palomar Airport, CA	Taxiway A1 at approach end of Runway 24	CRQ-03	2022	AWP	Non-Primary Commercial	National	Y	16	5
DAL	Dallas Love Field Airport, TX	Holding position on Taxiway A parallel to approach end of Runway 13L	DAL-HS1	2019	ASW	Medium	NA	Y	41	12
DCA	Ronald Reagan Washington National Airport, VA	Taxiway J at approach end of Runway 1	DCA-27	2023	AEA	Large	NA	Y	8	3
DCA	Ronald Reagan Washington National Airport, VA	Taxiway J at Runway 19 approach end	DCA-HS2	2015	AEA	Large	NA	Y	28	4
DCA	Ronald Reagan Washington National Airport, VA	Taxiway M and Taxiway G at the intersection with Runway 1/19 and Taxiway J	DCA-HS3	2023	AEA	Large	NA	Y	6	3
DEN	Denver International Airport, CO	Holding positions on Taxiway ED for Runway 17R approach area	DEN-HS1	2017	ANM	Large	NA	Y	31	4
DVT	Phoenix Deer Valley Airport, AZ	Approach end of Runway 7R	DVT-07	2018	AWP	Reliever	National	N	20	3
DVT	Phoenix Deer Valley Airport, AZ	Taxiway B5 between Taxiway B and Runway 7R/25L	DVT-HS1	2015	AWP	Reliever	National	N	12	3
DVT	Phoenix Deer Valley Airport, AZ	Taxiway B9 between Runways 7L/25R and 7R/25L	DVT-HS2	2016	AWP	Reliever	National	N	46	7

Airport Identifier	Airport Name	Location	Location Identifier	Year Added to RIM	Region	NPIAS ¹ Hub Classification	Asset Category	Part 139 ²	Cumulative RI	Peak CY Annual RI
DWH	David Wayne Hooks Memorial Airport, TX	Intersection of Taxiway C and Runway 17R/35L	DWH-HS1	2015	ASW	Reliever	Regional	N	28	5
DWH	David Wayne Hooks Memorial Airport, TX	Taxiway E at intersection with Runway 17R/35L	DWH-HS3	2023	ASW	Reliever	Regional	N	26	6
DWH	David Wayne Hooks Memorial Airport, TX	Intersection of Taxiway G and Runway 17L/35R	DWH-HS4	2018	ASW	Reliever	Regional	N	23	5
DWH	David Wayne Hooks Memorial Airport, TX	Taxiway K at Runway 17L approach end	DWH-HS6	2021	ASW	Reliever	Regional	N	13	6
EWR	Newark Liberty International Airport, NJ	Taxiway Z at approach end of Runway 22R (west of runway)	EWR-34	2022	AEA	Large	NA	Y	7	3
FAI	Fairbanks International Airport, AK	Intersection of Taxiway U and Runway 2 ski strip	FAI-11	2015	AAL	Small	NA	Y	9	3
FAT	Fresno Yosemite International Airport, CA	Runway 29R approach end	FAT-21	2016	AWP	Small	NA	Y	15	3
FCM	Flying Cloud Airport, MN	Approach ends of Runways 28L and 28R	FCM-HS1	2015	AGL	Reliever	National	N	24	4
FCM	Flying Cloud Airport, MN	Taxiway G at approach end of Runway 10L (north of runway)	FCM-HS3	2022	AGL	Reliever	National	N	11	4
FFZ	Falcon Field Airport, AZ	Taxiway B at intersection with Runway 4R/22L	FFZ-01	2019	AWP	Reliever	Regional	N	18	3
FFZ	Falcon Field Airport, AZ	Approach end of Runway 22L	FFZ-13	2018	AWP	Reliever	Regional	N	17	3
FFZ	Falcon Field Airport, AZ	Taxiway D5 at intersection with Runway 4R/22L	FFZ-19	2023	AWP	Reliever	Regional	N	7	3

Airport Identifier	Airport Name	Location	Location Identifier	Year Added to RIM	Region	NPIAS ¹ Hub Classification	Asset Category	Part 139 ²	Cumulative RI	Peak CY Annual RI
FRG	Republic Airport, NY	Taxiway A at intersection with Runway 1/19 (west of runway)	FRG-HS1	2022	AEA	Reliever	National	Y	11	3
<i>FWA</i>	<i>Fort Wayne International Airport, IN</i>	<i>Taxiway C2 at intersection with Runway 5/23</i>	<i>FWA-19</i>	<i>2023</i>	<i>AGL</i>	<i>Small</i>	<i>NA</i>	<i>Y</i>	<i>5</i>	<i>3</i>
GCN	Grand Canyon National Park Airport, AZ	Taxiways A and B at approach end of Runway 21	GCN-HS1	2020	AWP	Non-Hub Primary	NA	Y	25	5
GLS	Scholes International Airport At Galveston, TX	Taxiway E at intersection with Runway 18/36 (east of runway)	GLS-04	2015	ASW	Reliever	Regional	N	13	4
HIO	Portland-Hillsboro Airport, OR	Intersection of Runway 2/20 and Runway 13R/31L	HIO-16	2023	ANM	Reliever	National	N	12	4
HIO	Portland-Hillsboro Airport, OR	Intersection of Taxiways A and A6, and Runway 13R/31L	HIO-HS1	2018	ANM	Reliever	National	N	7	3
HLN	Helena Regional Airport, MT	Intersection of Taxiway C and approach end of Runway 35	HLN-01	2018	ANM	Non-Hub Primary	NA	Y	10	3
HND	Henderson Executive Airport, NV	Taxiway E at intersection with Runway 17R/35L (west of runway)	HND-HS2	2020	AWP	Reliever	National	N	5	3
HNL	Daniel K. Inouye International Airport, HI	Approach ends of Runways 4L and 4R	HNL-HS1	2015	AWP	Large	NA	Y	27	4
HNL	Daniel K. Inouye International Airport, HI	Taxiway E between Runways 4L/22R and 8L/26R	HNL-HS3	2016	AWP	Large	NA	Y	12	3
HNL	Daniel K. Inouye International Airport, HI	Intersection of Runway 8L approach and Taxiways A, J, and T	HNL-HS4	2015	AWP	Large	NA	Y	20	4

Airport Identifier	Airport Name	Location	Location Identifier	Year Added to RIM	Region	NPIAS ¹ Hub Classification	Asset Category	Part 139 ²	Cumulative RI	Peak CY Annual RI
HWD	Hayward Executive Airport, CA	Holding position on Taxiway Z1 parallel to approach end of Runway 28L	HWD-04	2020	AWP	Reliever	National	N	21	7
HWD	Hayward Executive Airport, CA	Approach end of Runway 28L	HWD-24	2021	AWP	Reliever	National	N	12	2
HWD	Hayward Executive Airport, CA	Holding position on Taxiway A1 parallel to approach end of Runway 28L	HWD-HS5	2016	AWP	Reliever	National	N	49	13
IAG	Niagara Falls International Airport, NY	Approach hold on Taxiway D for Runway 28R and Taxiway D1 at approach end of Runway 28R	IAG-HS2	2022	AEA	Non-Hub Primary	NA	Y	14	7
IWA	Phoenix-Mesa Gateway Airport, AZ	Approach end of Runway 12C	IWA-04	2015	AWP	Small	NA	Y	14	3
JLN	Joplin Regional Airport, MO	Holding position on Taxiway E parallel to approach end of Runway 13	JLN-HS1	2018	ACE	Non-Hub Primary	NA	Y	10	3
LAF	Purdue University Airport, IN	Intersection of Taxiways B, B3, and C and Runways 10/28 and 5/23	LAF-HS1	2019	AGL	General Aviation	Regional	Y	29	6
LAS	Harry Reid International Airport, NV	Intersection of Runways 8L/26R and 1R/19L	LAS-15	2022	AWP	Large	NA	Y	13	4
LAX	Los Angeles International Airport, CA	Taxiway AA between Runways 6L/24R and 6R/24L	LAX-HS1	2016	AWP	Large	NA	Y	30	6
LIT	Bill And Hillary Clinton National Airport/Adams Field, AR	Taxiway K at intersection with Runway 18/36 (west of runway)	LIT-12	2022	ASW	Small	NA	Y	4	3

Airport Identifier	Airport Name	Location	Location Identifier	Year Added to RIM	Region	NPIAS ¹ Hub Classification	Asset Category	Part 139 ²	Cumulative RI	Peak CY Annual RI
LOU	Bowman Field Airport, KY	Taxiway A1 at intersection with Runway 6/24	LOU-02	2022	ASO	Reliever	Regional	N	8	3
LVK	Livermore Municipal Airport, CA	Intersection of Runway 25R approach end and Taxiway B	LVK-HS1	2015	AWP	Reliever	Regional	N	45	6
LVK	Livermore Municipal Airport, CA	Intersection of Runway 25L approach end and Taxiway C	LVK-HS2	2015	AWP	Reliever	Regional	N	22	4
MEM	Memphis International Airport, TN	Intersection of Runway 27 approach end and Taxiway V2	MEM-01	2015	ASO	Small	NA	Y	3	3
MFE	McAllen Miller International Airport, TX	Taxiway A at approach end of Runway 14	MFE-HS1	2020	ASW	Non-Hub Primary	NA	Y	15	4
MIA	Miami International Airport, FL	Taxiway L1 between approach ends of Runways 8L and 8R	MIA-24	2020	ASO	Large	NA	Y	5	3
MIA	Miami International Airport, FL	Intersection of Taxiways N, M, M1, Q1, Q, and P between Runways 8R/26L and 12/30	MIA-HS4	2016	ASO	Large	NA	Y	14	3
MKC	Charles B. Wheeler Downtown Airport, MO	Taxiway G at intersection with Runway 3/21 (south of runway)	MKC-HS1	2022	ACE	Reliever	National	Y	15	4
MQY	Smyrna Airport, TN	Intersection of Runway 19 approach end and Taxiways C, B, and D	MQY-HS3	2022	ASO	Reliever	National	Y	23	8
MRI	Merrill Field Airport, AK	Taxiway K at approach end of Runway 25 (north of runway)	MRI-24	2020	AAL	Non-Hub Primary	NA	N	14	3
MRI	Merrill Field Airport, AK	Taxiway K at approach end of Runway 25 (south of runway)	MRI-25	2015	AAL	Non-Hub Primary	NA	N	16	3

Airport Identifier	Airport Name	Location	Location Identifier	Year Added to RIM	Region	NPIAS ¹ Hub Classification	Asset Category	Part 139 ²	Cumulative RI	Peak CY Annual RI
MRI	Merrill Field Airport, AK	Taxiway G at intersection with Runway 5/23	MRI-26	2015	AAL	Non-Hub Primary	NA	N	13	5
MYF	Montgomery-Gibbs Executive Airport, CA	Taxiway A at approach end of Runway 28R	MYF-01	2018	AWP	Reliever	Regional	N	21	4
MYF	Montgomery-Gibbs Executive Airport, CA	Taxiway H at intersection with Runway 5/23 (north of runway)	MYF-13	2018	AWP	Reliever	Regional	N	8	4
MYF	Montgomery-Gibbs Executive Airport, CA	Approach end of Runway 28R	MYF-15	2017	AWP	Reliever	Regional	N	17	5
MYF	Montgomery-Gibbs Executive Airport, CA	Taxiway F between Runways 10L/28R and 10R/28L	MYF-22	2017	AWP	Reliever	Regional	N	15	9
MYF	Montgomery-Gibbs Executive Airport, CA	Taxiway B at approach end of Runway 28L	MYF-HS3	2015	AWP	Reliever	Regional	N	23	5
OAK	Metropolitan Oakland International Airport, CA	Taxiway C at intersection with Runway 15/33	OAK-HS3	2022	AWP	Medium	NA	Y	6	3
OPF	Miami-Opa Locka Executive Airport, FL	Taxiway T8 at approach end of Runway 30	OPF-03	2019	ASO	Reliever	Regional	N	6	4
OPF	Miami-Opa Locka Executive Airport, FL	Taxiways T1 and T2 at approach end of Runway 12	OPF-20	2020	ASO	Reliever	Regional	N	13	3
PBI	Palm Beach International Airport, FL	LAHSO on Runway 14/32 north of Runway 10L/28R	PBI-24	2022	ASO	Medium	NA	Y	10	3
PBI	Palm Beach International Airport, FL	Holding position on parallel Taxiway L for approach end of Runway 10L	PBI-HS1	2023	ASO	Medium	NA	Y	10	5

Airport Identifier	Airport Name	Location	Location Identifier	Year Added to RIM	Region	NPIAS ¹ Hub Classification	Asset Category	Part 139 ²	Cumulative RI	Peak CY Annual RI
PDK	Dekalb-Peachtree Airport, GA	Taxiway G between Runway 3R/21L and 3L/21R	PDK-16	2023	ASO	Reliever	National	N	8	4
PIE	St Pete-Clearwater International Airport, FL	Taxiway A at approach end of Runway 4 (north of runway)	PIE-HS1	2018	ASO	Small	NA	Y	16	4
PNS	Pensacola International Airport, FL	Intersections of Runways 8/26 and 17/35 and Taxiways A, B, and D	PNS-HS1	2018	ASO	Small	NA	Y	30	6
POC	Brackett Field Airport, CA	Taxiway E at intersection with Runway 8L/26R (north of runway)	POC-02	2015	AWP	Reliever	Regional	N	10	2
PSP	Palm Springs International Airport, CA	Taxiway B at approach end of Runway 31R (east of runway)	PSP-HS3	2015	AWP	Small	NA	Y	19	4
PWM	Portland International Jetport, ME	<i>Holding position on parallel Taxiway C for approach end of Runway 18</i>	PWM-HS2	2023	ANE	Small	NA	Y	9	3
RHV	Reid-Hillview Airport Of Santa Clara County, CA	Taxiway E between approach ends of Runways 13L and 13R	RHV-01	2015	AWP	Reliever	Regional	N	21	4
RHV	Reid-Hillview Airport Of Santa Clara County, CA	Taxiway A at approach end of Runway 31R	RHV-HS2	2015	AWP	Reliever	Regional	N	20	3
RNO	Reno/Tahoe International Airport, NV	Approach end of Runway 34L	RNO-18	2022	AWP	Small	NA	Y	18	5
SAT	San Antonio International Airport, TX	Taxiway K at intersection with Runway 13R/31L	SAT-05	2015	ASW	Medium	NA	Y	14	6
SAT	San Antonio International Airport, TX	Intersection of Runways 4/22 and 13R/31L	SAT-HS1	2015	ASW	Medium	NA	Y	41	10

Airport Identifier	Airport Name	Location	Location Identifier	Year Added to RIM	Region	NPIAS ¹ Hub Classification	Asset Category	Part 139 ²	Cumulative RI	Peak CY Annual RI
SBA	Santa Barbara Municipal Airport, CA	Taxiway C between approach ends of Runways 15R and 15L	SBA-17	2022	AWP	Non-Hub Primary	NA	Y	6	3
SDL	Scottsdale Airport, AZ	Taxiway A16 at approach end of Runway 21	SDL-01	2023	AWP	Reliever	National	N	5	3
SDM	Brown Field Municipal Airport, CA	Taxiway B between Runways 8L/26R and 8R/26L	SDM-04	2018	AWP	Reliever	Regional	N	4	4
SEA	Seattle-Tacoma International Airport, WA	Taxiway C at approach end of Runway 16L (east of runway)	SEA-02	2015	ANM	Large	NA	Y	6	3
SFO	San Francisco International Airport, CA	Taxiway T between Runways 10L/28R and 10R/28L	SFO-HS3	2015	AWP	Large	NA	Y	20	4
SLC	Salt Lake City International Airport, UT	Intersection of approach ends of Runways 35 and 32, and Taxiways K1 and M	SLC-HS1	2015	ANM	Large	NA	Y	51	11
SLC	Salt Lake City International Airport, UT	Taxiway Q between Runways 34R/16L and 14/32	SLC-HS2	2016	ANM	Large	NA	Y	12	3
SNA	John Wayne/Orange County Airport, CA	Taxiway L between approach ends of Runways 20L and 20R	SNA-03	2015	AWP	Medium	NA	Y	6	2
SNA	John Wayne/Orange County Airport, CA	Taxiway K between Runways 2R/20L and 2L/20R	SNA-05	2023	AWP	Medium	NA	Y	11	4
SNA	John Wayne/Orange County Airport, CA	Taxiway L at approach end of Runway 20L (east of runway)	SNA-HS1	2015	AWP	Medium	NA	Y	19	3
STS	Charles M. Schulz - Sonoma County Airport, CA	Holding position on Taxiway A for the approach area of Runway 20	STS-08	2016	AWP	Non-Hub Primary	NA	Y	18	7

Airport Identifier	Airport Name	Location	Location Identifier	Year Added to RIM	Region	NPIAS ¹ Hub Classification	Asset Category	Part 139 ²	Cumulative RI	Peak CY Annual RI
STS	Charles M. Schulz - Sonoma County Airport, CA	Intersection of Taxiways H and A3 and the north run-up area	STS-HS3	2017	AWP	Non-Hub Primary	NA	Y	8	4
STS	Charles M. Schulz - Sonoma County Airport, CA	Intersection of Runways 14/32 and 2/20	STS-HS4	2019	AWP	Non-Hub Primary	NA	Y	32	6
TIW	Tacoma Narrows Airport, WA	Taxiway A4 at approach end of Runway 35	TIW-02	2021	ANM	General Aviation	Regional	N	6	5
TMB	Miami Executive Airport, FL	Taxiways E and H at intersections with Runway 13/31	TMB-14	2015	ASO	Reliever	Regional	N	15	3
TOA	Zamperini Field Airport, CA	Holding position on Taxiway H for approach area of Runway 29L	TOA-HS1	2020	AWP	Reliever	Regional	N	16	5
TUS	Tucson International Airport, AZ	Runway 29R approach end	TUS-HS1	2015	AWP	Small	NA	Y	20	4
TUS	Tucson International Airport, AZ	Taxiway D at intersections with approach ends of Runways 11L and 11R	TUS-HS2	2015	AWP	Small	NA	Y	52	8
UAO	Aurora State Airport, OR	Taxiway A1 at approach end of Runway 17	UAO-HS1	2018	ANM	General Aviation	National	N	10	5
UES	Waukesha County Airport, WI	Taxiway C3 at intersection with Taxiway C	UES-19	2023	AGL	Reliever	National	N	4	3
VGT	North Las Vegas Airport, NV	Intersection of Runway 7 approach end and Taxiways F and G	VGT-HS1	2016	AWP	Reliever	National	N	68	12
VGT	North Las Vegas Airport, NV	Intersection of Runway 12R approach end and Taxiway G	VGT-HS2	2015	AWP	Reliever	National	N	27	6

Airport Identifier	Airport Name	Location	Location Identifier	Year Added to RIM	Region	NPIAS ¹ Hub Classification	Asset Category	Part 139 ²	Cumulative RI	Peak CY Annual RI
VNY	Van Nuys Airport, CA	Taxiway C at intersection with Runway 16R/34L (west of runway)	VNY-11	2022	AWP	Reliever	National	N	19	4

**APPENDIX B—LOCATION DESCRIPTIONS OF RUNWAY INCURSION MITIGATION
MITIGATED LOCATIONS**

Table B-1 lists the RIM-Mitigated locations by fiscal year and their location descriptions.

Table B-1. The RIM-Mitigated Locations By Year

FY	Airport Identifier	Airport Name	Location Description
2015	CLT	Charlotte/Douglas International Airport, Charlotte, NC	Hold short bar on Taxiway D at intersection with Runway 5/23 (south of runway)
	FDK	Frederick Municipal Airport, Frederick, MD	Intersection of Taxiway A and Runway 12/30
2016	APA	Centennial Airport, Denver, CO	Taxiway A1 hold short bar at approach end of Runway 17L
	CRP	Corpus Christi International Airport, Corpus Christi, TX	Hold short bars on taxiways at approach ends of Runway 31 and Runway 36
	MDW	Chicago Midway International Airport, Chicago, IL	Hold short bar on Taxiways E1, E2, and E3 at approach end of Runway 31C
	RNO	Reno/Tahoe International Airport, Reno, NV	Hold short bar on Taxiway J, east of Runway 16L/34R
2017	ACT	Waco Regional Airport, Waco, TX	Approach end of Runway 32
	DWH	David Wayne Hooks Memorial Airport, Houston, TX	Intersection of Taxiway D, Taxiway E, and approach end of Runway 17L
	FXE	Fort Lauderdale Executive Airport, Fort Lauderdale, FL	Intersection of Runway 27 and Taxiway C
	FXE	Fort Lauderdale Executive Airport, Fort Lauderdale, FL	Taxiways E, J, L, and P at the approach end of Runway 9
	FXE	Fort Lauderdale Executive Airport, Fort Lauderdale, FL	Intersection of Runway 13/31 and Taxiway A
	PHL	Philadelphia International Airport, Philadelphia, PA	Hold short bar on Taxiway D (north side of runway) at intersection with Runway 9L/22R
	PHL	Philadelphia International Airport, Philadelphia, PA	Intersection of Taxiway D and the approach end of Runway 8
2018	ABQ	Albuquerque International Sunport, Albuquerque, NM	Approach ends of Runway 8 and Runway 12
	DAB	Daytona Beach International Airport, Daytona, FL	Intersection of Runway 7L/25R and Taxiway P5
	HUF	Terre Haute Regional Airport, Terre Haute, IN	Hold short bar for Taxiway D at approach end of Runway 14 and former Runway 18
	ISM	Kissimmee Gateway Airport, Orlando, FL	Intersection of Runway 15/33 and Taxiway B
	MLU	Monroe Regional Airport, Monroe, LA	Hold bar on Taxiway A between Runway 14 and Runway 18
	PRC	Ernest A. Love Field Airport, Prescott, AZ	Hold short bar at intersection of Runway 3R/21L and Taxiways C2 and E
	SEA	Seattle-Tacoma International Airport, Seattle, WA	Hold short bars on Taxiway F at intersection with Runway 16C/34C
	SEA	Seattle-Tacoma International Airport, Seattle, WA	Hold short bar on Taxiway Q for Runway 16L/34R
	SMO	Santa Monica Municipal Airport, Santa Monica, CA	Taxiway B at approach end of Runway 21

FY	Airport Identifier	Airport Name	Location Description
	TUL	Tulsa International Airport, Tulsa, OK	Intersection of Runway 8/26 and Taxiways C, J, and K
2019	DVT	Phoenix Deer Valley Airport, Phoenix, AZ	Hold short bar at intersection of Taxiway A4 and approach end of Runway 7L
	FTY	Fulton County Airport-Brown Field, Atlanta, GA	Intersection of Runway 8/26 and Taxiway K
	LGB	Long Beach Airport/Daugherty Field, Long Beach, CA	Intersection of approach end of Runway 26L and Taxiways D and F
	LOU	Bowman Field Airport, Louisville, KY	Hold short bar on Taxiway J at the intersection with Runway 6/24
	MAF	Midland International Air and Space Port, Midland, TX	Hold short bar on Taxiway A at approach end of Runway 10
	MHT	Manchester-Boston Regional Airport, Manchester, NH	Hold short bars on Taxiways P and U at intersection with approach end of Runway 35
	MIA	Miami International Airport, Miami, FL	Intersection of Runway 8R/26L and Taxiway M5
	MIA	Miami International Airport, Miami, FL	Taxiway T8 between Runway 12/30 and Runway 9/27
	SFB	Orlando Sanford International Airport, Orlando, FL	Hold short bar on Runway 18/36 south of Runway 9R
	SFB	Orlando Sanford International Airport, Orlando, FL	Taxiway R under approach path for Runway 9R
	SRQ	Sarasota/Bradenton International Airport, Sarasota/Bradenton, FL	Intersections of Runways 4/22 and 14/32 and Taxiways A, B, C, and D
	TMB	Miami Executive Airport, Miami, FL	Hold short bar on Taxiway A at approach end of Runway 9L
	VNY	Van Nuys Airport, Van Nuys, CA	Taxiway C and approach end of Runway 16L
2020	ADS	Addison Airport, Dallas, TX	Intersection of Taxiway G and Runway 15
	ADS	Addison Airport, Dallas, TX	Intersection of Taxiway C and Runway 33
	ATL	Hartsfield-Jackson Atlanta International Airport, Atlanta, GA	Hold bar on Taxiway D at intersection with Runway 9L/27R (south of runway)
	ATL	Hartsfield-Jackson Atlanta International Airport, Atlanta, GA	Intersection of Taxiway C and D at Runway 8R/26L
	CXO	Conroe-North Houston Regional Airport, Houston, TX	Intersection of Taxiway J and Runway 14/32 (eastbound)
	DAL	Dallas Love Field Airport, Dallas, TX	Intersection of Taxiways B5 and B6 and Runway 13L/31R
	FCM	Flying Cloud Airport, Minneapolis, MN	Hold bar on Taxiway C at approach end of Runway 28R from north FBO Ramp
	IWA	Phoenix-Mesa Gateway Airport, Phoenix, AZ	Intersection of Taxiways V and K and Runway 12R/30L
	JNU	Juneau International Airport, Juneau, AK	Intersection of Taxiway D and Runway 8/26
	LGB	Long Beach Airport/Daugherty Field, Long Beach, CA	Intersection of Taxiway J-D and Runways 8R/26L and 12/30
	MIC	Crystal Airport, Minneapolis, MN	Hold bars on Taxiway E4 between approach ends of Runways 14L and 14R
	ORD	Chicago O'Hare International Airport, Chicago, IL	The north portion of Taxiway T (Former Runway 14R/32L) within the approach area of Runway 9R/27L

FY	Airport Identifier	Airport Name	Location Description
	ORL	Orlando Executive Airport, Orlando, FL	Intersection of Taxiway E4 and Runway 7/25
	PAO	Palo Alto Airport, Palo Alto, CA	Intersection of Runway 31 and Taxiway A
	PDK	DeKalb-Peachtree Airport, Atlanta, GA	Intersection of Runway 21R and Taxiway G
	PDK	DeKalb-Peachtree Airport, Atlanta, GA	Intersection of Runway 3L and Taxiway A
	RNO	Reno/Tahoe International Airport, Reno, NV	Intersection of Taxiway C and Taxiway L
	TEB	Teterboro Airport, Teterboro, NJ	Taxiway B between Runway 19 and Runway 24
2021	CLE	Cleveland Hopkins International Airport, Cleveland, OH	Intersection of Taxiway R, Taxiway A, and Taxiway L
	DSM	Des Moines International Airport, Des Moines, IA	Intersection of Taxiway P and Runway 13/31
	HNL	Honolulu International Airport, Honolulu, HI	TWY E between Runway 4L/22R and Runway 4R/22L
	HNL	Honolulu International Airport, Honolulu, HI	Taxiway D between Runway 4L/22R and Runway 4R/22L
	HNL	Honolulu International Airport, Honolulu, HI	Taxiway F between Runway 4L/22R and Runway 4R/22L
	HNL	Honolulu International Airport, Honolulu, HI	Intersection of Taxiway F and Runway 4R/22L
	IDA	Idaho Falls Regional Airport, Idaho Falls, ID	Approach ends of Runway 17 and Runway 21
	LAX	Los Angeles International Airport, Los Angeles, CA	Intersection of Taxiway F and Runway 7L/25R and Runway 7R/25L
	LGB	Long Beach Airport/Daugherty Field, Long Beach, CA	Intersection of Taxiways B, D, and K between Runway 8L/26R and Runway 12/30
	MRI	Merrill Field Airport, Anchorage, AK	Intersection of Taxiway C and Runway 7/25
	PHX	Phoenix Sky Harbor International Airport, Phoenix, AZ	Landing threshold of Runway 25R
	SNA	John Wayne Airport/Orange County Airport, Santa Ana, CA	Taxiway H between Runway 2L/20R and Runway 22 approach
	TEB	Teterboro Airport, Teterboro, NY	Intersection of Taxiway L and Runway 6/24
2022	ABQ	Albuquerque International Sunport, Albuquerque, NM	Intersection of Taxiways G, F, and C near Runway 12/30 and Runway 3/21
	APC	Napa County Airport, Napa, CA	Approach end of Runway 19R
	BOI	Boise Air Terminal, Boise, IN	Intersection of Taxiways F and B3, and Runway 10R/28L
	BTV	Burlington International Airport, Burlington, VT	Intersection of Taxiway C and Runway 1/19
	CLE	Cleveland Hopkins International Airport, Cleveland, OH	Intersection of Taxiways S, L, and J, entering Runway 6R/24L
	CSG	Columbus Airport, Columbus, GA	Intersection of Taxiways A, C, and D
	DAL	Dallas Love Field, Dallas, TX	Holding position on Taxiway C parallel to the approach end of Runway 13R
	DAL	Dallas Love Field, Dallas, TX	Holding position on Taxiway L for the approach end of Runway 13R
	FAI	Fairbanks International Airport, Fairbanks, AK	Intersection of Taxiway T and Runway 2R/20L
	HOU	William P. Hobby Airport, Houston, TX	Holding positions on Taxiway E between Runways 17/35 and 13R/31L
	HOU	William P. Hobby Airport, Houston, TX	Holding position on Taxiway G at the approach end of Runway 4

FY	Airport Identifier	Airport Name	Location Description
	HOU	William P. Hobby Airport, Houston, TX	Holding position on Taxiway G at the approach end of Runway 13R
	MHT	Manchester-Boston Regional Airport, Manchester, NH	Holding position on Taxiway H for the approach end of Runway 17
	MYF	Montgomery-Gibbs Executive Airport, San Diego, CA	Holding position on Runway 5/23 southbound for Runway 10R/28L
	ORD	Chicago O'Hare International Airport, Chicago, IL	Intersection of Taxiways A1 and G when approaching Runways 4L/22R and 9R/27L
	PDK	DeKalb Peachtree Airport, Atlanta, GA	Intersection of Taxiways C and B between Runways 16/34, 3L/21R, and 3R/21L
	SJC	Norman Y. Mineta San Jose International Airport, San Jose, CA	Approach end of Runway 30R
	SJC	Norman Y. Mineta San Jose International Airport, San Jose, CA	Approach end of Runway 30L
	SPI	Abraham Lincoln Capital Airport, Springfield, IL	Intersection of Runways 13/31, 8/36, and 4/22
	TYR	Tyler Pounds Regional Airport, Tyler, TX	Holding position on Taxiway H parallel to approach end of Runway 22
2023	ADS	Addison Airport, Dallas, TX	Taxiway A at approach end of Runway 16
	APA	Centennial Airport, Denver, CO	Taxiway C1 at approach end of Runway 10
	APA	Centennial Airport, Denver, CO	Taxiway B8 at intersection with Runway 17L/35R
	DVT	Phoenix Deer Valley Airport, Phoenix, AZ	Hold short bar at intersection of Taxiway C3 and Runway 7R
	FCM	Flying Cloud Airport, Minneapolis, MN	Approach runway ends of Runways 10L and 10R
	HIO	Portland-Hillsboro Airport, Portland, OR	Taxiway A9 at approach end of Runway 31L
	HIO	Portland-Hillsboro Airport, Portland, OR	Taxiway A8 at intersection with Runway 13R/31L
	LAS	Harry Reid International Airport, Las Vegas, NV	Intersection of Runways 8L/26R and 1L/19R
	MLI	Quad Cities International Airport, IL	Intersection of Runways 13/31, 9/27, and 5/23
	NEW	Lakefront Airport, LA	Hold short bar on Taxiway F at approach end of Runway 36L
	PBI	Palm Beach International Airport, FL	Intersection of Runway 10R and Taxiway S
	PRC	Ernest A. Love Field Airport, Prescott, AZ	Hold bar at Taxiway A1 at the approach end of Runway 3L
	PRC	Ernest A. Love Field Airport, Prescott, AZ	Intersection of Taxiway C4/D4 and Runway 3R/21L

APPENDIX C—RUNWAY INCURSION MITIGATION MITIGATED LOCATIONS

Table C-1 shows the summary of RIM-Mitigated locations, RI pilot deviation (PD) and vehicle/pedestrian deviation (V/PD) totals for years 2007 to 2022, RI totals before and after mitigation, and average RIs per year before and after mitigation. Locations mitigated in FY2023 are highlighted in the Date Complete column. In the RI Totals Per Year column, red represents years with no mitigation in place, yellow represents year of mitigation, and green represents years after mitigation in place.

Table C-1. The RIM-Mitigated Locations Summary

Color Legend

Years Prior to Mitigation	Year Mitigation Was Completed	Years After Mitigation Was Completed
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RIM-Mitigated Locations					Runway Incursion (PD & V/PD) Totals Per Year																Runway Incursion (PD & V/PD) Totals		Average Runway Incursions (PD & V/PD) Per Year									
Region	Airport Name	Identifier	Mitigation Type	Date Complete	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation
AAL	Fairbanks International Airport	FAI-HS1	Taxiway/Runway Geometry Reconfiguration	10/29/2021	0	3	2	4	0	1	3	0	0	4	1	5	0	0	0	0	0	0	0	0	0	0	0	23	0	1.63	N/A ¹	
AAL	Juneau International Airport	JNU-01	Taxiway/Runway Geometry Reconfiguration	08/05/2020	0	0	1	0	0	3	1	2	2	0	0	1	0	1	1	0	0	0	0	0	0	0	11	1	0.86	N/A ¹		
AAL	Merrill Field Airport	MRI-13	Taxiway/Runway Geometry Reconfiguration	10/05/2020	0	2	1	4	0	0	0	4	1	2	0	0	0	1	0	0	0	0	0	0	0	15	0	1.15	N/A ¹			
ACE	Des Moines International Airport	DSM-HS2	Taxiway/Runway Geometry Reconfiguration	10/30/2020	1	0	1	1	0	0	0	1	0	3	2	0	0	1	0	3	0	0	0	0	0	10	3	0.76	N/A ¹			
AEA	Frederick Municipal Airport	FDK-HS3	Signage, Marking, and/or Lighting	07/10/2015	0	0	0	0	0	0	0	1	4	0	0	0	0	1	0	0	0	0	0	0	0	5	1	0.64	0.13			
AEA	Philadelphia International Airport	PHL-01	Signage, Marking, and/or Lighting	07/27/2017	0	0	2	0	2	1	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	6	2	0.61	0.37			

¹ Post-mitigation period is not long enough to provide a meaningful average that reflects the result of mitigation efforts.

RIM-Mitigated Locations					Runway Incursion (PD & V/PD) Totals Per Year														Runway Incursion (PD & V/PD) Totals		Average Runway Incursions (PD & V/PD) Per Year											
Region	Airport Name	Identifier	Mitigation Type	Date Complete	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation
	nal Airport		Lighting; Operational/Procedural																													
AEA	Philadelphia International Airport	PHL-HS1	Signage, Marking, and/or Lighting; Taxiway/Runway Geometry Reconfiguration	08/24/2017	1	2	1	1	0	1	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	8	0	0.81	0	
AEA	Teterboro Airport	TEB-HS1-2019	Taxiway/Runway Geometry Reconfiguration	11/22/2019	0	0	0	0	1	3	1	1	0	0	1	1	0	0	0	0	0	0	0	0	0	0	8	0	0.66	0		
AEA	Teterboro Airport	TEB-HS1-2021	Signage, Marking, and/or Lighting	06/01/2021	0	0	0	0	0	1	1	0	1	0	3	1	0	0	0	0	0	0	0	0	0	0	7	2	0.51	N/A ¹		
AGL	Cleveland Hopkins International Airport	CLE-HS1	Taxiway/Runway Geometry Reconfiguration	11/19/2021	0	0	4	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0	0.42	N/A ¹		
AGL	Cleveland Hopkins International Airport	CLE-HS2	Taxiway/Runway Geometry Reconfiguration	11/02/2020	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0.38	N/A ¹		
AGL	Flying Cloud Airport	FCM-13	Taxiway/Runway Geometry Reconfiguration	05/19/2023	0	0	0	2	0	0	1	1	2	0	2	1	1	3	3	1							17	N/A ²	1.11	N/A ¹		

² Post-mitigation runway incursion data are not yet available for mitigations implemented in CY2023.

RIM-Mitigated Locations					Runway Incursion (PD & V/PD) Totals Per Year														Runway Incursion (PD & V/PD) Totals		Average Runway Incursions (PD & V/PD) Per Year			
Region	Airport Name	Identifier	Mitigation Type	Date Complete	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation
AGL	Flying Cloud Airport	FCM-HS2	Taxiway/Runway Geometry Reconfiguration	08/27/2020	0	0	2	0	1	0	0	1	0	1	6	0	0	0	0	1	11	1	0.85	N/A ¹
AGL	Terre Haute Regional Airport	HUF-HS1	Taxiway/Runway Geometry Reconfiguration	12/10/2017	0	0	0	0	0	0	2	0	1	8	0	0	0	1	0	0	11	1	1.08	0.20
AGL	Chicago Midway International Airport	MDW-03	Signage, Marking, and/or Lighting	05/09/2016	0	0	1	0	0	3	0	1	0	0	0	0	1	0	1	1	5	3	0.58	0.45
AGL	Crystal Airport	MIC-HS6	Taxiway/Runway Geometry Reconfiguration	08/25/2020	0	1	1	4	4	1	2	0	0	1	2	2	1	1	0	0	20	0	1.55	N/A ¹
AGL	Quad Cities International Airport	MLI-20	Taxiway/Runway Geometry Reconfiguration	11/03/2022	0	0	2	0	0	0	8	2	0	0	1	0	0	0	0	1	13	1	0.86	N/A ¹
AGL	Chicago O'Hare International Airport	ORD-73	Taxiway/Runway Geometry Reconfiguration	06/01/2020	0	0	0	0	0	0	1	0	6	0	1	1	1	0	0	0	10	0	0.79	N/A ¹
AGL	Chicago O'Hare International Airport	ORD-HS1	Taxiway/Runway Geometry Reconfiguration	11/01/2021	0	1	0	0	0	0	2	0	0	1	0	1	6	2	0	0	13	0	0.92	N/A ¹

RIM-Mitigated Locations					Runway Incursion (PD & V/PD) Totals Per Year														Runway Incursion (PD & V/PD) Totals		Average Runway Incursions (PD & V/PD) Per Year				
Region	Airport Name	Identifier	Mitigation Type	Date Complete	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation
AGL	Abraham Lincoln Capital Airport	SPI-HS1	Taxiway/Runway Geometry Reconfiguration	09/08/2022	0	2	3	0	0	2	0	0	0	0	0	0	0	0	0	0	1	8	0	0.54	N/A ¹
ANE	Burlington International Airport	BTV-HS2	Signage, Marking, and/or Lighting	10/29/2021	0	1	0	0	1	1	1	0	0	2	3	2	3	0	1	0		15	0	1.06	N/A ¹
ANE	Manchester Boston Regional Airport	MHT-HS1	Taxiway/Runway Geometry Reconfiguration	08/12/2022	2	10	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	15	0	1.01	N/A ¹
ANE	Manchester Boston Regional Airport	MHT-HS2	Taxiway/Runway Geometry Reconfiguration	09/24/2019	2	1	1	0	1	1	0	0	0	0	0	0	0	0	2	0	0	6	2	0.50	0.61
ANM	Centennial Airport	APA-HS1	Taxiway/Runway Geometry Reconfiguration; Other	03/09/2016	0	3	2	2	3	1	2	1	4	0	1	1	2	1	2	1		18	8	2.13	1.17
ANM	Centennial Airport	APA-HS1	Taxiway/Runway Geometry Reconfiguration; Signage, Marking, and/or Lighting	08/30/2023	0	1	3	1	3	2	1	2	1	2	2	4	4	4	2	4		36	N/A ²	2.36	N/A ¹
ANM	Centennial Airport	APA-HS1	Signage, Marking, and/or Lighting	08/30/2023	0	1	0	2	2	0	0	2	4	8	2	2	8	2	1	2		36	N/A ²	2.36	N/A ¹

RIM-Mitigated Locations					Runway Incursion (PD & V/PD) Totals Per Year																Runway Incursion (PD & V/PD) Totals		Average Runway Incursions (PD & V/PD) Per Year	
Region	Airport Name	Identifier	Mitigation Type	Date Complete	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation
ANM	Boise Air Terminal	BOI-08	Taxiway/Runway Geometry Reconfiguration	12/04/2021	0	0	0	0	0	0	0	0	0	0	0	1	3	0	0	0	4	0	0.28	N/A ¹
ANM	Idaho Falls Regional Airport	IDA-HS2	Taxiway/Runway Geometry Reconfiguration	06/21/2021	1	0	1	0	0	4	1	0	0	1	0	1	2	0	2	2	13	2	0.95	N/A ¹
ANM	Portland-Hillsboro Airport	HIO-05	Signage, Marking, and/or Lighting	10/31/2022	0	1	0	0	2	1	0	0	0	3	3	0	1	1	3	0	15	0	0.99	N/A ¹
ANM	Portland-Hillsboro Airport	HIO-HS2	Signage, Marking, and/or Lighting	10/10/2022	0	0	0	1	1	0	2	4	0	2	2	1	1	3	3	4	23	1	1.53	N/A ¹
ANM	Seattle-Tacoma International Airport	SEA-26	Operational/Procedural	08/10/2018	0	1	0	1	0	0	0	4	0	0	0	0	1	0	0	0	6	1	0.55	0.23
ANM	Seattle-Tacoma International Airport	SEA-HS1	Signage, Marking, and/or Lighting	04/29/2018	0	1	2	2	0	1	1	1	0	0	0	1	0	0	0	0	8	1	0.76	0.21
ASO	Hartsfield Jackson Atlanta International Airport	ATL-18	Operational/Procedural	05/29/2020	0	1	0	1	0	3	0	0	0	0	0	2	0	0	2	0	7	2	0.55	N/A ¹

RIM-Mitigated Locations					Runway Incursion (PD & V/PD) Totals Per Year																Runway Incursion (PD & V/PD) Totals		Average Runway Incursions (PD & V/PD) Per Year	
Region	Airport Name	Identifier	Mitigation Type	Date Complete	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation
ASO	Hartsfield Jackson Atlanta International Airport	ATL-HS2	Operational/Procedural	05/29/2020	20	58	49	30	23	32	23	32	23	34	32	20	05	00			38	5	3.00	N/A ¹
ASO	Charlotte/Douglas International Airport	CLT-06	Operational/Procedural; Signage, Marking, and/or Lighting	06/18/2015	00	00	00	04	00	01	00	00	00	00	00	00	00	00	00	00	5	0	0.65	0
ASO	Columbus Airport	CSG-HS1	Signage, Marking, and/or Lighting	08/30/2022	00	00	00	00	00	00	00	00	00	00	00	04	00	00	00	00	4	0	0.27	N/A ¹
ASO	Daytona Beach International Airport	DAB-02	Taxiway/Runway Geometry Reconfiguration	08/04/2018	00	00	01	00	00	00	03	01	00	00	00	00	00	00	00	00	5	0	0.46	0
ASO	Fulton County Airport/Brown Field	FTY-04	Taxiway/Runway Geometry Reconfiguration	09/01/2019	00	00	00	04	00	00	00	00	00	00	00	00	00	00	00	00	4	0	0.34	0
ASO	Fort Lauderdale Executive Airport	FXE-08	Signage, Marking, and/or Lighting	02/16/2017	00	01	00	03	00	00	00	00	00	00	00	00	00	00	00	00	4	1	0.43	0.17
ASO	Fort Lauderdale Executive Airport	FXE-HS1	Signage, Marking, and/or Lighting	02/16/2017	00	00	01	00	00	01	01	02	01	00	00	01	04	00	02	01	6	8	0.64	1.36

RIM-Mitigated Locations					Runway Incursion (PD & V/PD) Totals Per Year																Runway Incursion (PD & V/PD) Totals		Average Runway Incursions (PD & V/PD) Per Year		
Region	Airport Name	Identifier	Mitigation Type	Date Complete	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation
					0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
					0	0	0	1	1	1	1	1	1	1	1	1	1	1	2	2	2				
					7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2					
ASO	Fort Lauderdale Executive Airport	FXE-HS3	Signage, Marking, and/or Lighting	02/16/2017	0	0	1	0	3	0	5	1	1	2	0	0	1	1	0	1	13	3	1.38	0.51	
ASO	Kissimmee Gateway Airport	ISM-02	Signage, Marking, and/or Lighting	07/31/2018	0	0	0	0	0	3	0	0	0	0	0	0	0	1	0	3	1	0.28	0.23		
ASO	Bowman Field Airport	LOU-01	Signage, Marking, and/or Lighting	05/01/2019	0	0	1	0	3	1	0	0	0	0	0	0	0	0	0	5	0	0.43	0		
ASO	Miami International Airport	MIA-HS1	Taxiway/Runway Geometry Reconfiguration; Signage, Marking, and/or Lighting	11/16/2018	0	3	0	0	1	0	0	1	0	0	0	0	0	0	0	5	0	0.45	0		
ASO	Miami International Airport	MIA-HS3	Taxiway/Runway Geometry Reconfiguration	8/16/2019	0	0	0	4	2	0	0	2	0	0	0	1	0	0	1	0	9	1	0.76	0.3	
ASO	Orlando Executive Airport	ORL-01	Taxiway/Runway Geometry Reconfiguration	05/06/2020	0	3	0	0	3	0	1	1	0	1	2	3	2	0	0	3	16	3	1.27	N/A ¹	
ASO	Palm Beach International Airport	PBI-02	Taxiway/Runway Geometry Reconfiguration; Signage, Marking, and/or Lighting	7/26/2023	0	0	3	0	0	0	0	0	0	0	0	0	3	2	0	1	9	NA ²	0.59	N/A	

RIM-Mitigated Locations					Runway Incursion (PD & V/PD) Totals Per Year																Runway Incursion (PD & V/PD) Totals		Average Runway Incursions (PD & V/PD) Per Year	
Region	Airport Name	Identifier	Mitigation Type	Date Complete	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation
					0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
					7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2				
ASO	DeKalb Peachtree Airport	PDK-HS1	Signage, Marking, and/or Lighting	12/31/2019	0	3	4	1	1	0	1	2	1	0	1	1	0	0	3	1	15	4	1.22	1.33
ASO	DeKalb Peachtree Airport	PDK-HS3	Signage, Marking, and/or Lighting	12/31/2019	0	0	4	1	1	0	1	0	0	1	1	0	0	1	0	2	9	3	0.73	1.0
ASO	DeKalb Peachtree Airport	PDK-11	Taxiway/Runway Geometry Reconfiguration	10/01/2021	0	1	0	0	1	0	1	2	3	4	0	0	1	0	0	13	0	0.93	N/A ¹	
ASO	Orlando Sanford International Airport	SFB-05	Taxiway/Runway Geometry Reconfiguration	10/15/2018	0	0	1	0	1	1	1	0	1	0	1	0	0	0	0	6	0	0.54	N/A ¹	
ASO	Orlando Sanford International Airport	SFB-HS2	Taxiway/Runway Geometry Reconfiguration	10/15/2018	0	3	1	0	1	3	0	2	5	2	0	0	0	0	0	17	0	1.54	N/A ¹	
ASO	Sarasota/Bradenton International Airport	SRQ-HS1	Taxiway/Runway Geometric Reconfiguration; Signage, Marking, and/or Lighting; Change(s), Technological Enhancements	08/08/2019	0	0	0	1	2	5	7	2	2	7	5	3	6	0	2	4	39	7	3.29	2.06
ASO	Miami Executive Airport	TMB-04	Taxiway/Runway Geometry Reconfiguration; Signage, Marking, and/or	03/29/2019	0	0	0	1	0	3	2	2	4	3	2	4	0	0	0	21	0	1.83	0	

RIM-Mitigated Locations					Runway Incursion (PD & V/PD) Totals Per Year																Runway Incursion (PD & V/PD) Totals		Average Runway Incursions (PD & V/PD) Per Year	
Region	Airport Name	Identifier	Mitigation Type	Date Complete	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation
			Lighting Change(s)																					
ASW	Albuquerque International Sunport	ABQ-HS1	Taxiway/Runway Geometry Reconfiguration	05/11/2018	0	1	0	2	1	2	2	2	1	0	0	2	1	0	1	2	12	5	1.13	1.08
ASW	Albuquerque International Sunport	ABQ-HS2	Taxiway/Runway Geometry Reconfiguration	09/16/2022	0	1	0	2	1	0	0	1	0	0	2	4	1	5	3	1	21	0	1.40	N/A ¹
ASW	Waco Regional Airport	ACT-04	Taxiway/Runway Geometry Reconfiguration; Operational/Procedural	10/10/2016	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0.11	0
ASW	Addison Airport	ADS-HS1	Signage, Marking, and/or Lighting	10/15/2022	0	3	5	4	5	2	3	0	2	2	2	5	1	1	2	1	37	1	2.46	N/A ¹
ASW	Addison Airport	ADS-HS4	Operational/Procedural	11/11/2019	0	0	0	1	1	0	9	0	0	0	0	0	0	0	0	11	0	0.91	0	
ASW	Addison Airport	ADS-HS8	Operational/Procedural	11/11/2019	1	1	0	1	2	1	0	0	1	0	0	0	0	0	0	7	0	0.58	0	
ASW	Corpus Christi International Airport	CRP-HS1	Taxiway/Runway Geometry Reconfiguration	05/26/2016	0	1	6	2	2	2	1	1	0	0	0	0	1	0	0	0	15	1	1.73	0.15

RIM-Mitigated Locations					Runway Incursion (PD & V/PD) Totals Per Year																Runway Incursion (PD & V/PD) Totals		Average Runway Incursions (PD & V/PD) Per Year				
Region	Airport Name	Identifier	Mitigation Type	Date Complete	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation
					0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
					0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2					
					7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2							
ASW	Conroe-North Houston Regional Airport	CXO-02	Signage, Marking, and/or Lighting	09/14/2020	0	0	0	0	4	1	0	0	0	0	0	0	0	0	0	0	0	5	0	0.39	N/A ¹		
ASW	Dallas Love Field	DAL-HS2	Signage, Marking, and/or Lighting	07/01/2022	0	1	6	3	1	0	3	5	3	5	3	0	3	0	2	0	35	0	2.37	N/A ¹			
ASW	Dallas Love Field	DAL-15	Signage, Marking, and/or Lighting	07/01/2022	0	0	0	0	0	1	0	0	0	0	2	7	2	0	0	12	0	0.81	N/A ¹				
ASW	Dallas Love Field Airport	DAL-33	Taxiway/Runway Geometry Reconfiguration	10/31/2019	0	0	1	0	3	0	3	2	0	0	0	1	0	0	0	10	0	0.83	0				
ASW	David Wayne Hooks Memorial Airport	DWH-HS2	Signage, Marking, and/or Lighting; Operational/Procedural; Taxiway/Runway Geometry Reconfiguration	12/31/2016	1	0	1	1	1	1	6	5	1	9	0	0	0	0	0	40	0	4.32	0				
ASW	William P. Hobby Airport	HOU-01	Taxiway/Runway Geometry Reconfiguration	07/01/2022	0	0	1	3	0	0	1	0	0	2	1	3	0	2	1	1	15	0	1.02	N/A ¹			
ASW	William P. Hobby Airport	HOU-15	Taxiway/Runway Geometry Reconfiguration	07/01/2022	1	0	0	0	0	1	1	0	0	1	3	1	0	0	1	0	9	0	0.61	N/A ¹			
ASW	William P. Hobby Airport	HOU-HS2	Taxiway/Runway Geometry Reconfiguration	07/01/2022	0	0	4	2	3	0	1	0	0	3	1	2	2	1	2	1	22	0	1.49	N/A ¹			

RIM-Mitigated Locations					Runway Incursion (PD & V/PD) Totals Per Year																Runway Incursion (PD & V/PD) Totals		Average Runway Incursions (PD & V/PD) Per Year				
Region	Airport Name	Identifier	Mitigation Type	Date Complete	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation
					0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
					0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2				
ASW	Midland International Air and Space Port Airport	MAF-HS2	Taxiway/Runway Geometry Reconfiguration	01/01/2019	0	1	0	0	6	1	1	0	1	2	1	0	0	1	0	0	0	13	1	1.15	0		
ASW	Monroe Regional Airport	MLU-HS1	Taxiway/Runway Geometry Reconfiguration	05/04/2018	1	0	0	4	0	0	0	0	0	1	0	0	1	0	0	0	6	1	0.57	0.21			
ASW	Lakefront Airport	NEW-HS3	Signage, Marking, and/or Lighting	03/17/2023	0	0	0	1	1	1	1	1	2	2	2	2	0	0	1	2	26	N/A ²	1.70	N/A ¹			
ASW	Tulsa International Airport	TUL-HS1	Taxiway/Runway Geometry Reconfiguration	08/01/2018	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	3	0	0.28	0				
ASW	Tyler Pounds Regional Airport	TYR-HS2	Signage, Marking, and/or Lighting	08/04/2022	0	0	0	0	0	0	0	0	0	0	0	0	0	5	1	2	14	1	0.94	N/A ¹			
AWP	Napa County Airport	APC-09	Other	11/23/2021	0	0	0	0	0	0	0	0	1	0	1	4	0	1	0	7	0	0.49	N/A ¹				
AWP	Phoenix Deer Valley Airport	DVT-12	Taxiway/Runway Geometry Reconfiguration	05/07/2019	0	0	0	1	2	3	0	1	2	3	0	1	0	2	1	1	13	4	1.12	1.09			
AWP	Phoenix Deer Valley Airport	DVT-24	Operational/Procedural	06/21/2023	0	0	0	0	0	0	0	0	0	0	0	0	0	2	9	2	13	0	0.85	N/A ¹			

RIM-Mitigated Locations					Runway Incursion (PD & V/PD) Totals Per Year																Runway Incursion (PD & V/PD) Totals		Average Runway Incursions (PD & V/PD) Per Year		
Region	Airport Name	Identifier	Mitigation Type	Date Complete	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation
AWP	Honolulu International Airport	HNL-01	Signage, Marking, and/or Lighting	07/02/2021	0	0	1	1	0	1	2	0	2	3	1	0	0	1	2	2	14	2	1.02	N/A ¹	
AWP	Honolulu International Airport	HNL-02	Signage, Marking, and/or Lighting	07/02/2021	0	0	1	0	1	4	1	2	3	2	2	1	0	0	1	1	17	2	1.24	N/A ¹	
AWP	Honolulu International Airport	HNL-HS6	Signage, Marking, and/or Lighting	07/02/2021	0	0	1	0	0	1	0	4	3	1	2	0	2	0	0	1	14	1	1.02	N/A ¹	
AWP	Honolulu International Airport	HNL-36	Signage, Marking, and/or Lighting	07/02/2021	0	0	0	0	0	1	1	0	1	3	0	4	1	0	2	1	13	1	0.94	N/A ¹	
AWP	Phoenix-Mesa-Gateway Airport	IWA-16	Taxiway/Runway Geometry Reconfiguration	07/16/2020	1	1	3	0	1	1	2	1	0	1	1	3	0	0	0	1	15	1	1.17	N/A ¹	
AWP	Harry Reid International Airport	LAS-HS1	Taxiway/Runway Geometry Reconfiguration	09/01/2023	3	0	1	0	0	1	2	3	1	3	3	3	3	2	3	4	32	N/A ²	2.10	N/A ¹	
AWP	Los Angeles International Airport	LAX-HS3	Signage, Marking, and/or Lighting	08/08/2021	3	1	3	1	2	3	1	3	3	5	2	1	6	2	2	1	38	1	2.74	N/A ¹	

RIM-Mitigated Locations					Runway Incursion (PD & V/PD) Totals Per Year															Runway Incursion (PD & V/PD) Totals		Average Runway Incursions (PD & V/PD) Per Year			
Region	Airport Name	Identifier	Mitigation Type	Date Complete	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	
					0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					0
					0	0	0	1	1	1	1	1	1	1	1	1	1	2	2	2					
					7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2					
AWP	Long Beach Airport (Daugherty Field)	LGB-HS1	Taxiway/Runway Geometry Reconfiguration	12/29/2020	0	1	0	0	0	1	0	0	0	0	0	2	3	0	0	0	0	7	0	0.53	N/A ¹
AWP	Long Beach Airport (Daugherty Field)	LGB-HS3	Taxiway/Runway Geometry Reconfiguration	09/15/2020	0	2	3	2	0	0	1	1	1	1	1	0	0	1	0	0	13	0	1.00	N/A ¹	
AWP	Long Beach Airport (Daugherty Field)	LGB-35	Taxiway/Runway Geometry Reconfiguration	10/11/2018	0	0	1	1	0	1	4	0	0	0	1	0	0	0	0	8	0	0.72	0		
AWP	Montgomery-Gibbs Executive Airport	MYF-HS2	Operational/Procedural	01/07/2022	0	0	0	0	0	0	0	0	0	0	1	0	1	5	3	1	10	1	0.70	N/A ¹	
AWP	Palo Alto Airport	PAO-01	Taxiway/Runway Geometry Reconfiguration	12/31/2019	0	5	0	3	1	2	1	5	4	7	7	4	5	1	2	1	44	4	3.59	1.33	
AWP	Phoenix Sky Harbor International Airport	PHX-02	Technological Enhancements	08/26/2021	0	2	0	1	0	1	1	0	0	0	0	1	0	0	0	6	0	0.43	N/A ¹		
AWP	Ernest A. Love Field Airport	PRC-HS2-2018	Taxiway/Runway Geometry Reconfiguration	08/31/2018	0	0	2	0	0	3	2	1	2	1	0	0	0	0	0	11	0	1.01	0		
AWP	Ernest A. Love Field Airport	PRC-HS2-2023-1	Taxiway/Runway Geometry Reconfiguration	03/17/2023	0	1	4	0	1	1	2	3	1	4	1	0	2	3	1	0	24	N/A ²	1.57	N/A ¹	

RIM-Mitigated Locations					Runway Incursion (PD & V/PD) Totals Per Year														Runway Incursion (PD & V/PD) Totals		Average Runway Incursions (PD & V/PD) Per Year				
Region	Airport Name	Identifier	Mitigation Type	Date Complete	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation
AWP	Ernest A. Love Field Airport	PRC-HS2-2023-2	Taxiway/Runway Geometry Reconfiguration	08/17/2023	0	1	4	1	0	1	0	1	0	0	1	3	0	1	0	2		15	N/A ²	0.98	N/A ¹
AWP	Reno/Tahoe International Airport	RNO-11	Taxiway/Runway Geometry Reconfiguration; Signage, Marking, and/or Lighting	05/31/2016	0	0	0	0	0	0	0	0	5	0	0	0	0	0	1	0		5	1	0.58	0.15
AWP	Reno/Tahoe International Airport	RNO-HS2	Taxiway/Runway Geometry Reconfiguration	07/11/2020	0	0	0	1	0	0	0	2	4	5	3	0	2	0	0	0		17	0	1.33	N/A ¹
AWP	Norman Y. Mineta San Jose International Airport	SJC-28	Signage, Marking, and/or Lighting	09/08/2022	0	0	2	0	0	0	1	0	1	1	0	0	0	0	0	0		5	0	0.33	N/A ¹
AWP	Norman Y. Mineta San Jose International Airport	SJC-29	Signage, Marking, and/or Lighting	06/06/2022	1	2	0	0	0	0	0	0	0	1	0	0	0	0	0	0		4	N/A ²	0.27	N/A ¹
AWP	Santa Monica Municipal Airport	SMO-02	Taxiway/Runway Geometry Reconfiguration	12/22/2017	0	0	0	0	0	3	3	5	3	5	1	1	0	0	0	0		20	1	1.95	0.20
AWP	John Wayne Airport-Orange County	SNA-HS2	Signage, Marking, and/or Lighting	04/03/2021	0	1	1	0	0	1	0	4	0	6	0	1	0	0	2	0		14	2	1.04	N/A ¹

RIM-Mitigated Locations					Runway Incursion (PD & V/PD) Totals Per Year														Runway Incursion (PD & V/PD) Totals		Average Runway Incursions (PD & V/PD) Per Year											
Region	Airport Name	Identifier	Mitigation Type	Date Complete	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation
AWP	Van Nuys Airport	VNY-02	Signage, Marking, and/or Lighting	03/31/2019	0	1	0	0	0	1	2	4	1	0	2	0	0	0	1	1								11	2	0.96	0.53	
																									1364	101	1.07	0.36				