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Federal Aviation Administration  
William J. Hughes Technical Center  
Aviation Research Division  
Atlantic City International Airport  
New Jersey 08405

# **Runway Incursion Mitigation Fiscal Year 2018 Annual Summary Report**

February 2019

Final Report

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16. Abstract On the Federal Aviation Administration (FAA) website, a runway incursion is defined 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." These occurrences, which include wrong runway landings and takeoffs, remain a top airport safety concern for the FAA. Research has shown that airport geometry can contribute to runway incursions. The FAA has provided airports with guidance on recommended taxiway layouts in both Advisory Circular 150/5300-13 and Engineering Brief Number 75. Airport layouts that do not conform to these recommendations can lead to pilot confusion and ultimately, runway incursions. The FAA launched the Runway Incursion Mitigation (RIM) program in fiscal year 2015 (FY15) in an effort to mitigate the nonstandard geometry factors present at airport locations that have experienced a high number of runway incursions.  The FAA maintains a RIM program database that is updated on an annual basis, which includes all towered airports. During each annual update, all runway incursions and surface incidents (pilot deviation (PD) and vehicle/pedestrian deviation (V/PD)) from the previous calendar year, including wrong surface landings and takeoffs, are georeferenced in the geographic information system database. The layout of each airport is also reviewed annually to determine if locations with previously identified nonstandard geometry characteristics have been changed and/or mitigated. Locations with new nonstandard geometry characteristics are identified as well. If a location has three or more runway incursions in a single calendar year or an average of one runway incursion per year since the program began, it is considered for inclusion in the RIM inventory.  Since the RIM program was initiated in FY15, a total of 4767 runway incursions (PD and V/PD) and 219 nonstandard geometry locations have been added to the database. At the end of FY18, there were 135 locations in the RIM inventory at 79 airports and 33 locations mitigated since the program's inception. Airports utilized a variety of mitigation strategies to eliminate the problematic geometry characteristics or reduce their effect at these locations. Mitigation strategies include modifications to airport geometry, changes to lighting, markings, or signage, or changes to procedures or operations.					
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## LIST OF ACRONYMS

AC	Advisory Circular
ARP	Office of Airports
CY	Calendar year
EB	Engineering Brief
FAA	Federal Aviation Administration
FY	Fiscal year
GIS	Geographic information system
HQ	Headquarters
ILS	Instrument landing system
PD	Pilot deviation
PTG	Problematic taxiway geometry
RIM	Runway incursion mitigation
V/PD	Vehicle/pedestrian deviation

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

ABQ	Albuquerque International Sunport Airport, Albuquerque, New Mexico
ACT	Waco Regional Airport, Waco, Texas
ADS	Addison Airport, Dallas, Texas
APA	Centennial Airport, Denver, Colorado
ATL	Hartsfield–Jackson Atlanta International Airport, Atlanta, Georgia
AZO	Kalamazoo/Battle Creek International, Kalamazoo, Michigan
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
CCR	Buchanan Field Airport, Concord, California
CLE	Cleveland Hopkins International Airport, Cleveland, Ohio
CLT	Charlotte/Douglas International Airport, Charlotte, North Carolina
CMA	Camarillo Airport, Camarillo, California
CNO	Chino Airport, Chino, California
CRP	Corpus Christi International Airport, Corpus Christi, Texas
CRQ	Mc Clellan-Palomar Airport, Carlsbad, California
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
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
FTY	Fulton County Airport-Brown Field, Atlanta, Georgia
FXE	Fort Lauderdale Executive Airport, Fort Lauderdale, Florida
GLS	Scholes International Airport, Galveston, Texas
HIO	Portland-Hillsboro Airport, Portland, Oregon
HLN	Helena Regional Airport, Helena, Montana
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, Alameda County, California
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
LAS	McCarran International Airport, Las Vegas, Nevada
LAX	Los Angeles International Airport, Los Angeles, California
LFT	Lafayette Regional Airport, Lafayette, Louisiana
LGB	Long Beach Airport/Daughtry Field, Long Beach, California
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
MHT	Manchester-Boston Regional Airport, Manchester, New Hampshire
MIA	Miami International Airport, Miami, Florida
MIC	Crystal Airport, Minneapolis, Minnesota
MLI	Quad City Airport, Moline, Illinois
MLU	Monroe Regional Airport, Monroe, Louisiana
MRI	Merrill Field, Anchorage, Alaska
MSY	Louis Armstrong New Orleans International Airport, New Orleans, Louisiana
MYF	Montgomery-Gibbs Executive Airport, San Diego, California
NEW	Lakefront Airport, New Orleans, Louisiana
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, 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
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
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. Schultz-Sonoma County Airport, Santa Rosa, California

TEB	Teterboro Airport, Teterboro, New Jersey
TMB	Miami Executive Airport, Miami, Florida
TUL	Tulsa International Airport, Tulsa, Oklahoma
TUS	Tucson International Airport, Tucson, Arizona
UAO	Aurora State Airport, Aurora, Oregon
VGT	North Las Vegas Airport, Las Vegas, Nevada
VNY	Van Nuys Airport, Van Nuys, California

## EXECUTIVE SUMMARY

On their official website, the Federal Aviation Administration (FAA) defines a runway incursion 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.” These occurrences, which include wrong runway landings and takeoffs, remain a top airport safety concern for the FAA. Research has shown that airport geometry can contribute to runway incursions. As a result, the FAA has provided airports with guidance on recommended taxiway layouts in Advisory Circular 150/5300-13, “Airport Design” and Engineering Brief Number 75, “Incorporation of Runway Incursion Prevention into Taxiway and Apron Design.” Airport layouts that do not conform to these recommendations can lead to pilot confusion and ultimately, runway incursions.

In fiscal year (FY) 2012, the FAA Office of Airports initiated a research study to identify and geographically locate areas at airports with nonstandard geometry. This effort involved developing a geographic information system (GIS) database that included a graphical interface of airport locations with nonstandard geometry, also known as problematic taxiway geometry (PTG) locations, all pilot deviation (PD) and vehicle/pedestrian deviation (V/PD) runway incursions, including wrong runway events, surface incidents, airport diagrams and information, and hot spots. The initial study and field verification process identified 140 locations with a high incidence of runway incursions using data from October 1, 2007 to September 30, 2013 after studying 5376 runway incursion reports. As a result, the Runway Incursion Mitigation (RIM) program was launched in FY15 in an effort to mitigate the nonstandard geometry factors present at these locations and ultimately reduce the number of runway incursions.

Updated on an annual basis, the RIM program database only includes towered airports. During each annual update, all runway incursions and surface incidents (PD and V/PD) from the previous calendar year, including wrong surface landings and takeoffs, are georeferenced in the GIS database. The layout of each airport is also reviewed annually to determine if locations with previously identified nonstandard geometry characteristics have been changed and/or mitigated. Locations with new nonstandard geometry characteristics are identified as well. If a location has three or more runway incursions in a single calendar year or an average of one runway incursion per year over the course of the program, it is considered for inclusion in the RIM inventory. The FAA staff then performs a series of validations to determine which locations ultimately go into the inventory.

Since the RIM program was initiated in FY15, an additional 4767 runway incursions (PD and V/PD) and 219 PTG locations have been added to the database. At the end of FY18, there were 135 locations in the RIM inventory at 79 airports and 33 locations that have been mitigated through the program. Airports utilized a variety of mitigation strategies to eliminate the problematic geometry characteristics or reduce their effect at these locations. Mitigation strategies include modifications to airport geometry, changes to lighting, markings, or signage, or changes to procedures or operations.

## 1. INTRODUCTION.

The Federal Aviation Administration (FAA) defines a runway incursion 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” [1]. These occurrences, which include wrong runway landings and takeoffs, remain a top airport safety concern for the FAA. Several studies in recent years have found that confusing airport geometry can contribute to these incursions.

The FAA conducted an initial study in which runway incursions from 1997 to 2003 that resulted from a pilot deviation (PD) or a vehicle/pedestrian deviation (V/PD) were analyzed by plotting them on airport diagrams [2]. Analysis of these incursions found that certain taxiway locations experienced far more runway incursions than other locations [2]. Through additional research, the FAA identified taxiway geometry configurations that could be associated with a higher incidence of runway incursions [2]. This led the FAA Airport Engineering Division to publish Engineering Brief (EB) 75, “Incorporation or Runway Incursion Prevention into Taxiway and Apron Design,” in November 2007 [3]. Subsequently, the FAA revised Advisory Circular (AC) 150/5300-13, “Airport Design” [4], in September 2012 to incorporate the airport layout recommendations from EB 75. Both documents provide airports with guidance for how to design taxiways in a manner that will reduce confusion and increase situational awareness. Airport layouts not conforming to these recommendations can lead to confusion and ultimately, runway incursions.

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 runway incursions. This effort, detailed in the FAA report “Problematic Taxiway Geometry Study Overview” [5], involved developing a geographic information system (GIS) database that included airport locations with nonstandard geometry, also known as problematic taxiway geometry (PTG) locations, all PD and V/PD deviation runway incursions, including wrong runway events, surface incidents, airport diagrams and information, and hot spots. The initial study and field validation process identified 140 locations with a high incidence of runway incursions 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, was launched in FY15 in an effort to mitigate the nonstandard geometry factors present at these locations and ultimately reduce the number of runway incursions. The FAA maintains a RIM program website, which can be accessed at [https://www.faa.gov/airports/special\\_programs/rim/](https://www.faa.gov/airports/special_programs/rim/) [6].

## 2. ANNUAL DATABASE UPDATES.

The FAA maintains the RIM database including all data relevant to the program from 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, and Title 14 Code of Federal Regulations Part 139 status [7], herein referred to as Part 139. The current FAA airport diagram can be displayed within the database. Additionally, hot spots and their descriptions are updated every 28 days, when applicable.

All runway incursions and surface incidents that are categorized as V/PDs or PDs by the FAA Office of Runway Safety are included for each airport in the database. This includes wrong runway landings and takeoffs. On an annual basis, the database is updated to incorporate new data. The update process typically occurs during the second quarter of the fiscal year and involves analysis of all runway incursions from the previous calendar year (CY). The location of each runway incursion is determined by reviewing the narrative in the incursion report. Each incursion is then georeferenced in the database.

In addition to analyzing runway incursions, the layout of each airport is reviewed annually to determine if locations with previously identified nonstandard geometry characteristics were changed and/or mitigated. Locations with new nonstandard geometry characteristics are identified as well. The FAA identified 19 nonstandard taxiway geometry characteristics that can lead to pilot confusion. Locations that have at least one of the nonstandard geometry characteristics below are designated as PTG locations. [8]

- 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-node 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 (i.e., non-sequential taxiway designation schemes, absence of full-length parallel taxiway, taxiway intersection along the middle third of a runway, etc.)

Once all runway incursions from the previous CY are georeferenced, annual and cumulative runway incursion counts for each PTG location are reviewed to determine which locations meet the criteria to be considered as a potential new RIM location. The criteria are: (1) three or more runway incursions in a single CY, or (2) an average of one or more runway incursions per year since FY08.

Locations that meet at least one of these criteria are further reviewed to determine inclusion for the field validation. The purpose of field validation, which occurs after each annual database update and typically lasts approximately two months, is to obtain feedback from FAA field personnel regarding locations that are being considered for classification as RIM locations. Information obtained from the field, such as extenuating circumstances surrounding runway incursions (i.e., construction activity, air shows, other special events, etc.) and whether mitigations are underway, is considered. ARP personnel use this information to make a final determination regarding which locations to add to the RIM inventory. Once a final determination is made, the updated RIM inventory is published on the FAA website [6]. Figure 1 provides a summary of the annual database update process, which typically begins in January and is completed in September.

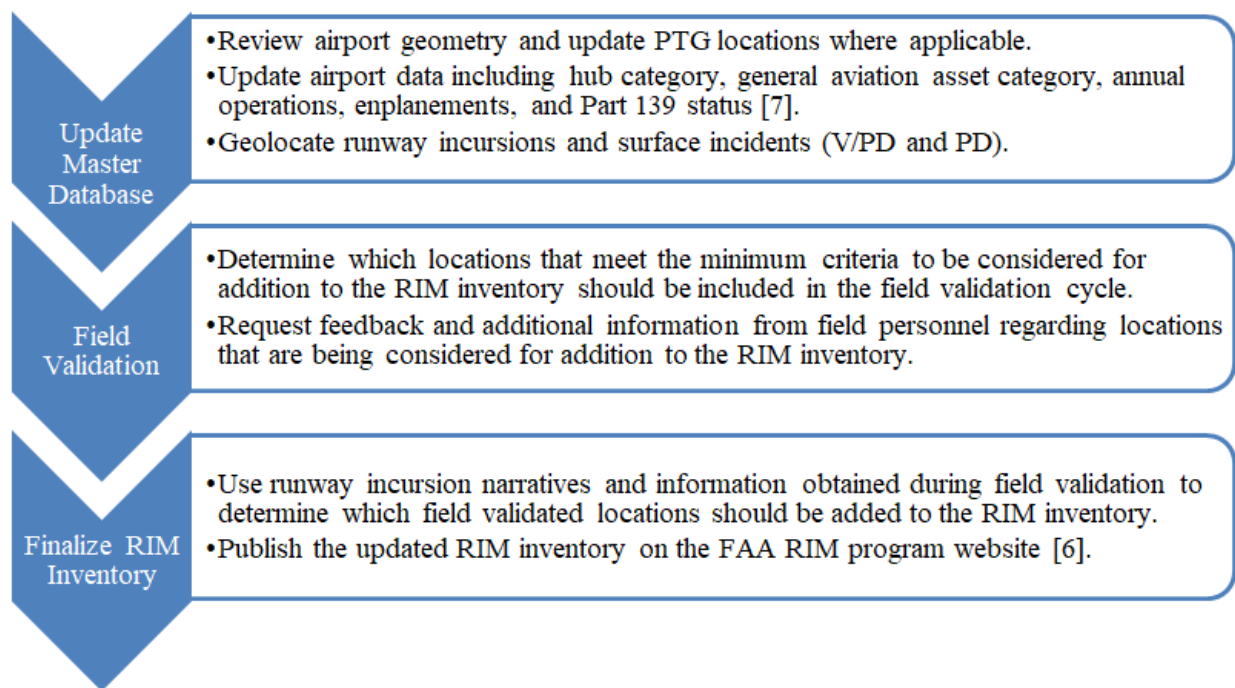


Figure 1. The RIM Database Update Process

The FAA maintains a website, referred to as the RIM Data Management (RDM) tool [9] that allows field and FAA headquarters (HQ) personnel to share information related to potential or active RIM locations, monitor the progress of mitigation for RIM locations, and assess the success of the program overall. Additionally, non-FAA users, such as the Airline Pilots Association, airport sponsors, and industry consultants are provided limited access to the tool. Runway incursion and GIS data are updated in the tool on an annual basis. FAA users may update information (mitigation progress, etc.) related to specific RIM locations at any time.

## 2.1 THE CY14–CY17 PROGRAM SUMMARY.

The RIM database has undergone four annual updates since the initial FY12 study [5]. With these updates, a total of 4767 runway incursions (PD and V/PD) and 219 PTG locations were added to the database. Also, four field validation cycles coincided with these annual database updates. These cycles were completed in July 2015, December 2016, July 2017, and July 2018. A total of 61 new RIM locations were added after these validation cycles. Figure 2 provides a breakdown of runway incursions that were added with each update, while figure 3 shows the number of PTG locations that were added with each update. Figure 4 shows the counts of locations that became RIM after each validation cycle. The most recent database update and validation cycle, which took place in 2018, will be covered in depth in section 2.2.

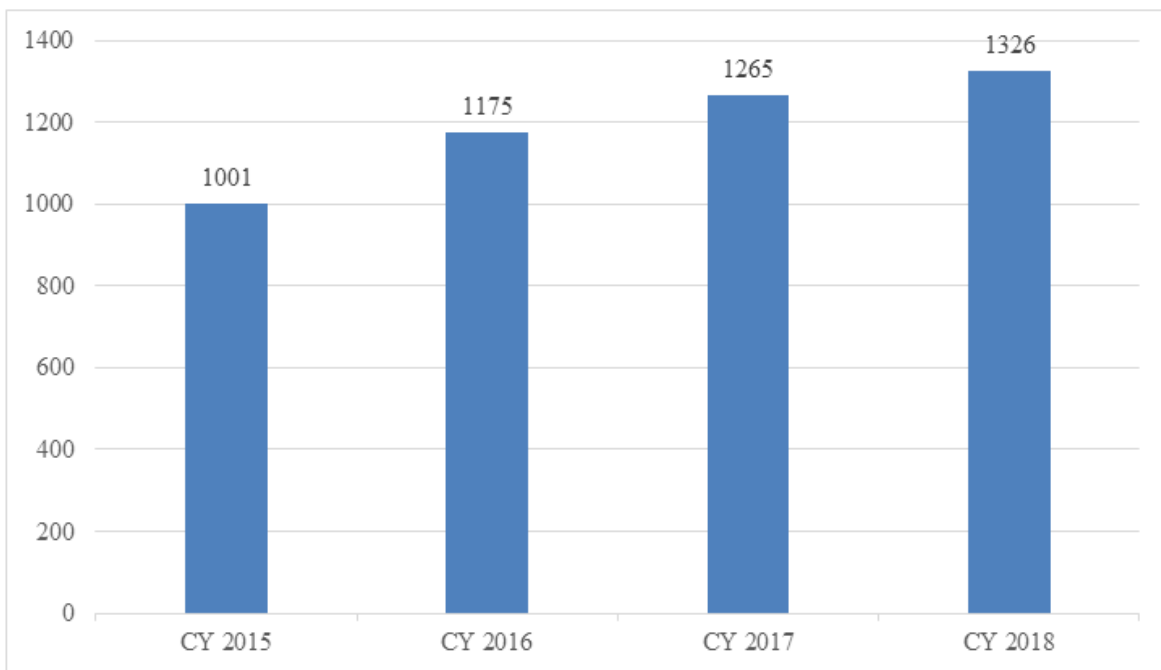


Figure 2. Runway Incursions Added to RIM Database Per CY

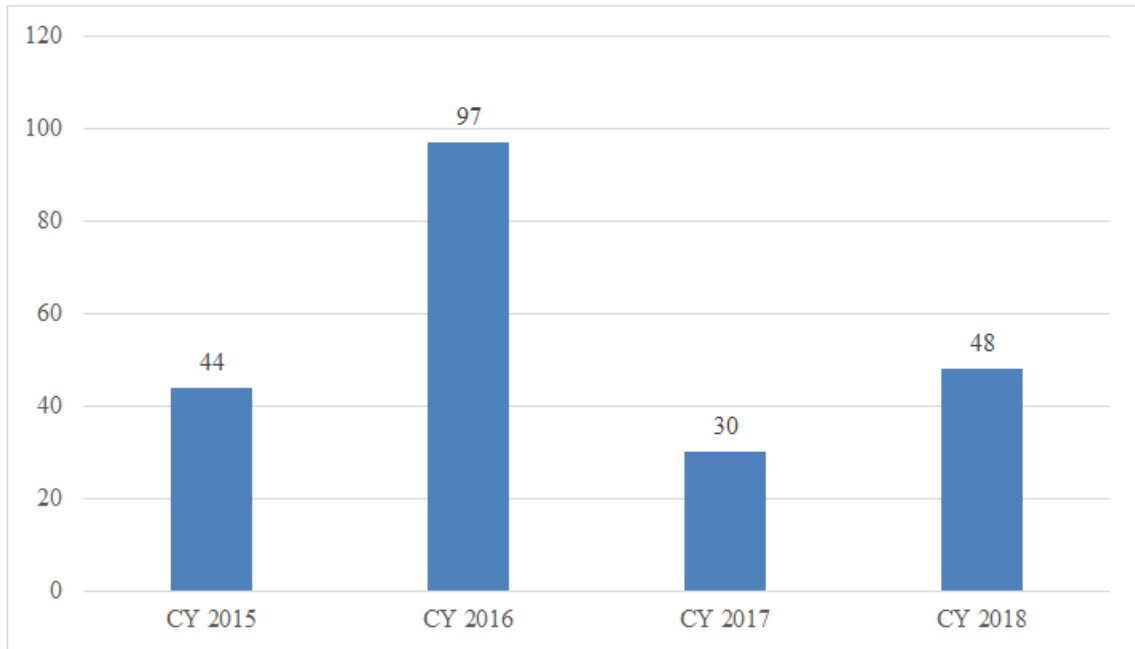


Figure 3. The PTG Locations Added to RIM Database Per CY

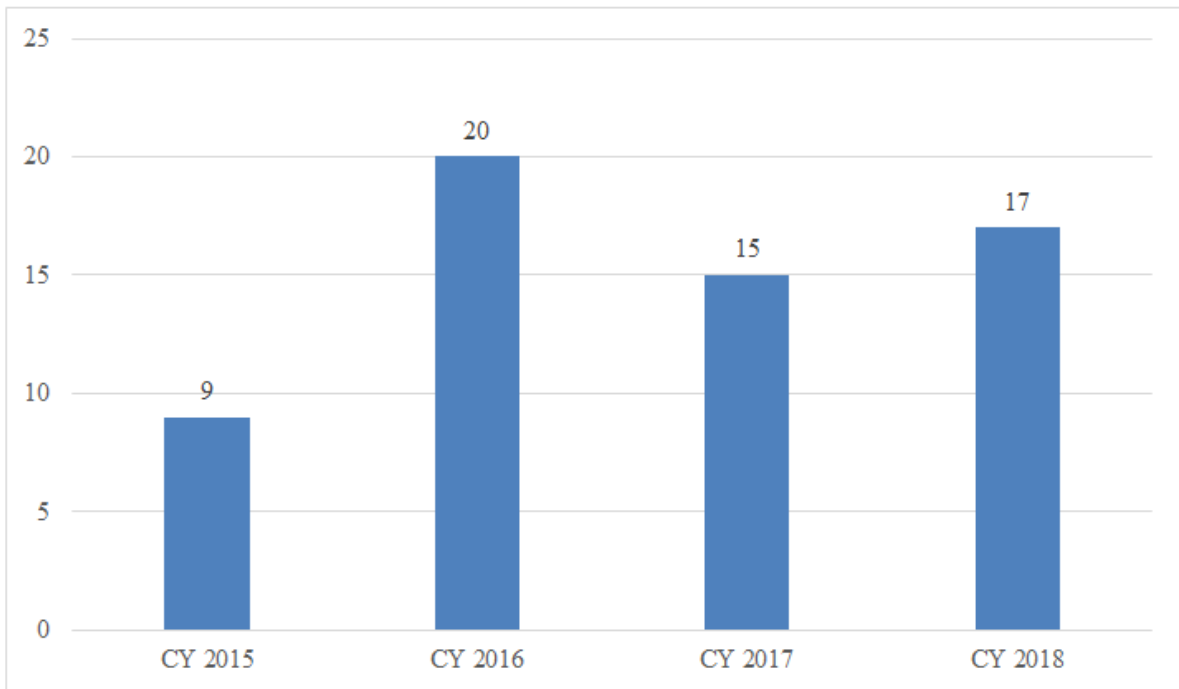


Figure 4. The RIM Locations Added Per Validation Cycle



## 2.2 THE CY18 PROGRAM UPDATE.

The CY18 RIM database update was completed in April 2018. With this update, 1326 runway incursions (PD and V/PD) from CY17 were analyzed and georeferenced. This increased the overall number of runway incursions (PD and V/PD) in the database to 10,143. These incursions occurred at 518 airports between FY08 and the end of CY17. Additionally, 48 new PTG locations were added to the database. Analysis of runway incursion (PD and V/PD) counts identified 32 PTG locations that met the minimum criteria to be considered for validation. Of these locations, 26 were included in the field validation cycle. Based on information obtained during field validation, 17 PTG locations were added to the RIM inventory in FY18. Table 1 lists these 17 locations and provides relevant details such as location, peak year runway incursion counts, and cumulative runway incursion counts.

Table 1. The FY18 New RIM Locations: Summary Data

Airport Name and Identifier	Location Description	Peak Year Runway Incursion Count	Cumulative Runway Incursion Count
Boise Air Terminal/ Gowen Field Airport (BOI)	Hold short bar on Taxiway J, north of Runway 10R approach end	3	8
Burlington International Airport (BTV)	Intersection of Taxiway C and Runway 1/19	3	8
Chino Airport (CNO)	Taxiway L between Runways 3/21 and 8R/26L	5	6
Phoenix Deer Valley Airport (DVT)	Approach end of Runway 7R	3	9
David Wayne Hooks Memorial Airport (DWH)	Intersection of Taxiway G and Runway 17L/35R	3	3
Falcon Field Airport (FFZ)	Approach end of Runway 22L	3	16
Portland-Hillsboro Airport (HIO)	Intersection of Taxiways A, A6, and Runway 13R/31L	3	4
Helena Regional Airport (HLN)	Intersection of Taxiway C and approach end of Runway 35	3	10
William P. Hobby Airport (HOU)	Hold short bar on Taxiway G at approach end of Runway 4	3	7
Joplin Regional Airport (JLN)	Instrument landing system (ILS) hold line and hold short bar on Taxiway E at approach end of Runway 13	3	10
Montgomery-Gibbs Executive Airport (MYF)	Taxiway A at approach end of Runway 28R	3	10
Montgomery-Gibbs Executive Airport (MYF)	Taxiway H hold short bar between approach ends of Runway 5 and Runway 10R	4	6
St. Petersburg-Clearwater International Airport (PIE)	Hold short bar on Taxiway A, north of approach end of Runway 4	3	4
Pensacola International Airport (PNS)	Intersections of Runway 8/26, 17/35, and Taxiways A, B, and D	13	5

Table 1. The FY18 New RIM Locations: Summary Data (Continued)

Airport Name and Identifier	Location Description	Peak Year Runway Incursion Count	Cumulative Runway Incursion Count
Brown Field Municipal Airport (SDM)	Taxiway B between Runways 8L/26R and 8R/26L	4	4
Teterboro Airport (TEB)	Intersection of Taxiway L and Runway 6/24	3	7
Aurora State Airport (UAO)	Taxiway A1 at Runway 17 end	5	6

### 2.3 THE RIM INVENTORY.

At the end of FY18, there were 135 active RIM locations at 79 airports and every FAA region in various stages of mitigation. Several airports have more than one active RIM location. Among airports with multiple RIM locations, HNL in Honolulu, Hawaii; CNO in Chino, California; and MYF in San Diego, California have the most RIM locations with seven, five, and five RIM locations, respectively. Table 2 lists the Core 30 airports that currently have RIM locations.

Table 2. Core 30 Airports With RIM Locations

Airport Name and Identifier	Number of RIM Locations
Chicago O’Hare International Airport (ORD)	1
Daniel K. Inouye International Airport (HNL)	7
Denver International Airport (DEN)	1
General Edward Lawrence Logan International Airport (BOS)	3
Hartsfield–Jackson Atlanta International Airport (ATL)	3
Los Angeles International Airport (LAX)	3
McCarran International Airport (LAS)	1
Memphis International Airport (MEM)	1
Miami International Airport (MIA)	3
Phoenix Sky Harbor International Airport (PHX)	1
Ronald Reagan Washington National Airport (DCA)	1
Salt Lake City International Airport (SLC)	2
San Francisco International Airport (SFO)	1
Seattle-Tacoma International Airport (SEA)	1

The complete RIM inventory as of the end of FY18 is provided in appendix A and can be found at [https://www.faa.gov/airports/special\\_programs/rim/](https://www.faa.gov/airports/special_programs/rim/) [6].

### 3. MITIGATION ANALYSIS.

Once a PTG location is added to the RIM inventory, relevant stakeholders (FAA personnel, local airport authority, etc.) coordinate to determine the most appropriate mitigation strategies for the location. When mitigation strategies have been selected, the project advances to the planning (and possibly environmental) and design phase, during which details of the project are determined, such as funding sources, project timeline, and construction specifics. If the

mitigation is a capital improvement, the project then advances to the construction phase, during which the mitigation strategies are implemented. The 135 active RIM locations are in various stages of mitigation. Figure 5 below provides a breakdown of RIM locations by mitigation milestone. As shown, 112 (83%) active RIM locations have initiated mitigation activities and are in the planning, design, or construction phases. Note that of the 23 (17%) RIM locations that do not yet have a project identified, 10 (43%) were recently added to the RIM inventory in the fourth quarter of FY18.

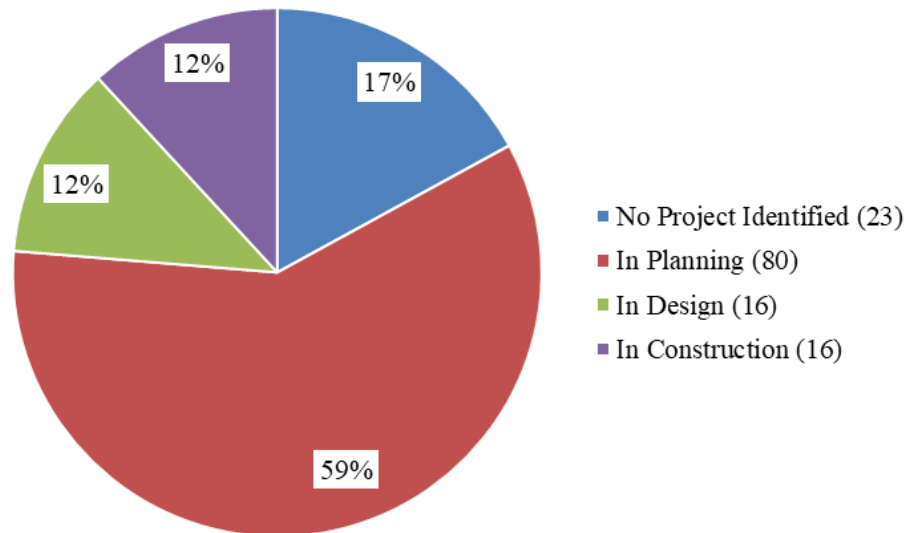


Figure 5. Status of Active RIM Locations

Airports can utilize a variety of mitigation strategies to eliminate nonstandard geometry configurations and reduce the likelihood of pilot confusion and ultimately, runway incursions. AC 150/5300-13 [4] and EB 75 [3] provide airports with recommended taxiway layouts. Airports often use a combination of mitigation strategies for RIM locations. Mitigation strategies can include changes to airport geometry, lights, signs, markings, and/or operational procedures. Table 3 provides some examples of mitigation strategies.

Table 3. Mitigation Strategy Examples [9]

Mitigation Type	Mitigation Strategy Examples
Airport Geometry Changes	<ul style="list-style-type: none"> <li>• Reconfigure taxiway to intersect runway at 90-degree angle</li> <li>• Relocate taxiway to eliminate direct access</li> <li>• Narrow the taxiway pavement entrance</li> </ul>
Lighting	<ul style="list-style-type: none"> <li>• Install runway end identifier lights (REILs)</li> <li>• Install elevated or in pavement runway guard lights</li> </ul>
Signage	<ul style="list-style-type: none"> <li>• Relocate signs to meet FAA standards</li> <li>• Install runway holding position signs at runway/runway intersections where operational use as a taxiway cannot be avoided</li> <li>• Adjust hold position signs to align with incoming taxiway centerline</li> </ul>

Table 3. Mitigation Strategy Examples (Continued)

Mitigation Type	Mitigation Strategy Examples
Markings	<ul style="list-style-type: none"> <li>• Relocate markings to meet FAA standards</li> <li>• Install enhanced centerline markings</li> <li>• Collocate ILS and hold position markings</li> <li>• Install runway holding position markings at runway/runway intersections</li> </ul>
Procedures/Operational	<ul style="list-style-type: none"> <li>• Notify pilots of problems with correct runway selection through Automated Traffic Information System (ATIS), Notice to Airman (NOTAMs), and airport diagram notations</li> <li>• Eliminate use of runways as taxiways</li> </ul>

FAA HQ and regional personnel monitor the mitigation progress for each active RIM location. After construction and other non-construction mitigations have been fully implemented, FAA field personnel communicate the status to FAA HQ personnel. Then, HQ personnel review mitigation details and, if necessary, visit the airport to confirm the implemented mitigations are satisfactory. If so, the location is considered mitigated and is removed from the RIM inventory. Location monitoring continues each year to ensure the mitigations were successful.

At the end of FY18, 33 locations had been mitigated through the RIM program. Airports utilized a variety of mitigation strategies to eliminate the problematic geometry characteristics or reduce their effect at these locations. The breakdown of mitigated RIM locations by FY is shown in table 4.

Table 4. Breakdown of RIM Mitigated Locations by FY

Fiscal Year	Mitigated Locations
2015	<ul style="list-style-type: none"> <li>• Charlotte/Douglas International Airport (CLT), North Carolina: Hold bar on Taxiway D at intersection with Runway 5/23 (south of runway)</li> <li>• Frederick Municipal Airport (FDK), Maryland: Intersection of Taxiway A and Runway 12/30</li> </ul>
2016	<ul style="list-style-type: none"> <li>• Centennial Airport (APA), Colorado: Taxiway A1 hold bar at approach end of Runway 17L</li> <li>• Chicago Midway International Airport (MDW), Illinois: Hold bar on Taxiways E1, E2, and E3 at approach end of Runway 31C</li> <li>• Corpus Christi International Airport (CRP), Texas: Hold bars on taxiways at approach ends of Runway 31 and Runway 36</li> <li>• Reno/Tahoe International Airport (RNO), Nevada: Hold bar on Taxiway J, east of Runway 16L/34R</li> <li>• Santa Barbara Municipal Airport (SBA), California: Taxiway C between approach ends of Runway 15R and Runway 15L</li> </ul>

Table 4. Breakdown of RIM Mitigated Locations by FY (Continued)

Fiscal Year	Mitigated Locations
2017	<ul style="list-style-type: none"> <li>• Centennial Airport (APA), Colorado: Approach end of Runway 35R</li> <li>• Centennial Airport (APA), Colorado: Hold bar on Taxiway B8 at intersection with Runway 17L/35R</li> <li>• Dallas Love Field Airport (DAL), Texas: Hold bar on Taxiway A at approach end of Runway 13L</li> <li>• Dallas Love Field Airport (DAL), Texas: Hold bar on Taxiway C at approach end of Runway 13R</li> <li>• David Wayne Hooks Memorial Airport (DWH), Texas: Intersection of Taxiway D, Taxiway E, and approach end of Runway 17L</li> <li>• David Wayne Hooks Memorial Airport (DWH), Texas: Intersection of Runway 17R/35L and Taxiway E</li> <li>• Fort Lauderdale Executive Airport (FXE), Florida: Intersection of Runway 27 and Taxiway C</li> <li>• Fort Lauderdale Executive Airport (FXE), Florida: Taxiways E, J, L, and P at the approach end of Runway 9</li> <li>• Fort Lauderdale Executive Airport (FXE), Florida: Intersection of Runway 13/31 and Taxiway A</li> <li>• Mc Clellan-Palomar Airport (CRQ), California: Hold short bar on Taxiway A1 at intersection with approach end of Runway 24</li> <li>• Palm Beach International Airport (PBI), Florida: Intersection of Runway 10R and Taxiway S</li> <li>• Palm Beach International Airport (PBI), Florida: Intersection of Runway 10L and Taxiway L</li> <li>• Philadelphia International Airport (PHL), Pennsylvania: Hold bar on Taxiway D (north side of runway) at intersection with Runway 9L/22R</li> <li>• Philadelphia International Airport (PHL), Pennsylvania: Intersection of Taxiway D and the approach end of Runway 8</li> <li>• Waco Regional Airport (ACT), Texas: Approach end of Runway 32</li> </ul>

Table 4. Breakdown of RIM Mitigated Locations by FY (Continued)

Fiscal Year	Mitigated Locations
2018	<ul style="list-style-type: none"> <li>• Albuquerque International Sunport Airport (ABQ), New Mexico: Approach ends of Runway 8 and Runway 12</li> <li>• Daytona Beach International Airport (DAB), Florida: Intersection of Runway 7L/25R and Taxiway P5</li> <li>• Ernest A. Love Field Airport (PRC), Arizona: Hold bar at intersection of Runway 3R/21L and Taxiways C2 and E</li> <li>• Kissimmee Gateway Airport (ISM), Florida: Intersection of Runway 15/33 and Taxiway B</li> <li>• Rocky Mountain Metropolitan Airport (BJC), Colorado: Approach end of Runway 30R</li> <li>• Santa Monica Municipal Airport (SMO), California: Taxiway B at approach end of Runway 21</li> <li>• Seattle-Tacoma International Airport (SEA), Washington: Hold short bars on Taxiway F at intersection with Runway 16C/34C</li> <li>• Seattle-Tacoma International Airport (SEA), Washington: Hold short bar on Taxiway Q for Runway 16L/34R</li> <li>• Terre Haute Regional Airport (HUF), Indiana: Hold bar for Taxiway D at approach end of Runway 14 and former Runway 18</li> <li>• Teterboro Airport (TEB), New Jersey: Taxiway B between Runway 19 and Runway 24</li> <li>• Tulsa International Airport (TUL), Oklahoma: Intersection of Runway 8/26 and Taxiways C, J, and K</li> </ul>

The 33 RIM mitigated locations experienced 366 runway incursions prior to mitigation, compared to 11 runway incursions after mitigation. Similarly, the average annual number of runway incursions at these locations decreased from a rate of 1.20 prior to mitigation to a rate of 0.64 after mitigation. Because these locations were recently mitigated between FY15 and FY18, significant post-mitigation runway incursion trending data do not yet exist. These locations will be monitored over time to determine if mitigation efforts were successful and whether or not additional mitigation will be necessary. Summary data for all RIM mitigated locations are provided in appendix B.

#### 4. CONCLUSION.

In fiscal year (FY) 2015, the Federal Aviation Administration (FAA) launched a 15- to 20-year improvement program known as the Runway Incursion Mitigation (RIM) program. The goal of the RIM program is to identify locations at towered airports that have nonstandard geometry characteristics and a high occurrence of runway incursions, mitigate the nonstandard geometry characteristics present at these locations, and ultimately reduce the number of runway incursions at these locations.

At the end of FY18, there were 135 active RIM locations at 79 airports. Of these locations, 112 had initiated mitigation activities and were in the planning, design, or construction phases. A total of 33 locations were mitigated through the RIM program. Hot spots were removed from the airport diagrams at eight of these locations as a result of mitigation. The FAA will continue to monitor these locations to ensure the mitigations successfully reduced the number of runway incursions.

FAA headquarters (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 assist with mitigation strategies, as the ultimate goal is to reduce runway incursions as much as possible.

## 5. REFERENCES.

1. Federal Aviation Administration (FAA), “Runway Safety: Runway Incursions,” available at [https://www.faa.gov/airports/runway\\_safety/news/runway\\_incursions/](https://www.faa.gov/airports/runway_safety/news/runway_incursions/) (date last visited January 14, 2019).
2. Legarreta, G., “Improved Taxiway Designs for Greater Airfield Safety and Efficiency,” FAA internal report, March 30, 2012.
3. FAA, “Incorporation of Runway Incursion Prevention into Taxiway and Apron Design,” Engineering Brief 75, November 19, 2007.
4. FAA, “Airport Design,” Advisory Circular (AC) 150/5300-13, September 28, 2012.
5. Vitagliano, L., Canter, G., and Aland, R., “Problematic Taxiway Geometry Study Overview,” FAA report DOT/FAA/TC-18/2, January 2018.
6. FAA, “Runway Incursion Mitigation (RIM) Program,” available at [https://www.faa.gov/airports/special\\_programs/rim/](https://www.faa.gov/airports/special_programs/rim/) (date last visited January 14, 2019).
7. U.S. Federal Register, Title 14 Code of Federal Regulations Part 139, “Airport Certification,” Government Printing Office, Washington, DC, 2004.
8. FAA, “Airport Geometry Data Elements,” AJI-14 Runway Safety Group, FAA internal report, October 2, 2013.
9. FAA, “Runway Incursion Mitigation (RIM) Toolbox: A Guide to Understanding Runway Incursion Geocodes and Strategies for Mitigation,” Microsoft® PowerPoint® presentation available at <http://www.faa.gov> after login to the RIM Data Management Tool, 2016.

## APPENDIX A—RUNWAY INCURSION MITIGATION INVENTORY

The Federal Aviation Administration (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 pilot deviation (PD) and vehicle/pedestrian deviation (V/PD) data collected from fiscal year (FY) 2008 – calendar year (CY) 2017 indicate airport locations where three or more peak annual RIs have occurred in a given CY or more than ten RIs have cumulatively occurred during this period. Table A-1 shows this information, which is subject to change as the FAA works with the airport sponsors. The RIM program inventory will be updated as projects proceed and additional RI data are collected.



Table A-3. The RIM Program Inventory of Airport Locations as of December 2018

Airport Name	Location	Location Identifier	Region	National Plan of Integrated Airport Systems (NPIAS) Hub Classification	Asset Category	Part 139*	Cumulative RI (PD and V/PD)	Peak CY Annual RI (PD and V/PD)
Addison (ADS)	Taxiway A entrance to approach end of Runway 15	ADS-HS1	ASW	Reliever	National	N	28	5
Addison (ADS)	Runway 15-33/Taxiway G intersection	ADS-HS4	ASW	Reliever	National	N	11	9
Addison (ADS)	Runway 15-33/Taxiway C intersection	ADS-HS8	ASW	Reliever	National	N	7	2
Centennial (APA)	Approach end Runway 10	APA-HS3	ANM	Reliever	National	N	19	4
Hartsfield-Jackson Atlanta International (ATL)	Runway 9L-27R/Taxiway D intersection, south side	ATL-18	ASO	Large	N/A	Y	5	3
Hartsfield-Jackson Atlanta International (ATL)	Runway 8L-26R/Taxiway C, D intersections	ATL-HS1	ASO	Large	N/A	Y	14	4
Hartsfield-Jackson Atlanta International (ATL)	Runway 8R-26L/Taxiway C, D intersections	ATL-HS2	ASO	Large	N/A	Y	28	5
Kalamazoo/Battle Creek International (AZO)	Runway 17/Taxiway C intersection	AZO-02	AGL	Non-hub primary	N/A	Y	5	3
Boise Air Terminal/ Gowen Field (BOI)	Hold short bar on Taxiway J, north of Runway 10R approach end	BOI-01	ANM	Small	N/A	Y	8	3
General Edward Lawrence Logan International (BOS)	Runway 15L/Runway 22R intersection	BOS-HS1	ANE	Large	N/A	Y	10	3

\*U.S. Federal Register, Title 14 Code of Federal Regulations Part 139, "Airport Certification," Government Printing Office, Washington, DC, 2004.

Table A-3. The RIM Program Inventory of Airport Locations as of December 2018 (Continued)

Airport Name	Location	Location Identifier	Region	NPIAS Hub Classification	Asset Category	Part 139*	Cumulative RI (PD and V/PD)	Peak CY Annual RI (PD and V/PD)
General Edward Lawrence Logan International (BOS)	Runway 4L approach end/ Taxiway E, K intersections	BOS-HS3	ANE	Large	N/A	Y	20	4
General Edward Lawrence Logan International (BOS)	Runway 4R/14 - 32 intersection	BOS-47	ANE	Large	N/A	Y	9	3
Burlington International Airport (BVT)	Intersection of Taxiway C and Runway 1/19	BTV-HS2	ANE	Small	N/A	Y	8	3
Buchanan Field (CCR)	Runway 32R/Taxiway B intersection	CCR-03	AWP	Reliever	National	Y	11	4
Cleveland-Hopkins International (CLE)	Five-point intersection of Taxiways J, L, S, and Runway 6R/24L	CLE-HS1	AGL	Medium	N/A	Y	5	4
Cleveland-Hopkins International (CLE)	Five-point intersection of Taxiways R, L, A, and Runway 6R/24L	CLE-HS2	AGL	Medium	N/A	Y	5	5
Camarillo (CMA)	Runway 26 approach end	CMA-01	AWP	Reliever	National	N	14	5
Chino (CNO)	Taxiway P between Runway 26R approach end and 26L	CNO-05	AWP	Reliever	National	N	4	3
Chino (CNO)	Hold short bar on Taxiway P north of Runway 26R	CNO-10	AWP	Reliever	National	N	20	8
Chino (CNO)	Runway 26L approach end	CNO-19	AWP	Reliever	National	N	14	6
Chino (CNO)	Taxiway L between Runways 3/21 and 8R/26L	CNO-HS2	AWP	Reliever	National	N	6	5
Chino (CNO)	Runway 8L-26R/Taxiway K intersection	CNO-HS4	AWP	Reliever	National	N	12	5

\*U.S. Federal Register, Title 14 Code of Federal Regulations Part 139, "Airport Certification," Government Printing Office, Washington, DC, 2004.

The RIM Program Inventory of Airport Locations as of December 2018 (Continued)

Airport Name	Location	Location Identifier	Region	NPIAS Hub Classification	Asset Category	Part 139*	Cumulative RI (PD and V/PD)	Peak CY Annual RI (PD and V/PD)
Conroe-North Houston Regional (CXO)	Intersection of Runway 14/32 and Taxiway J	CXO-02	ASW	Reliever	National	N	5	4
Dallas Love Field (DAL)	Runway 13L-31R/Taxiway B5 intersection	DAL-33	ASW	Medium	N/A	Y	9	3
Ronald Reagan Washington National (DCA)	Runway 19 approach end	DCA-04	AEA	Large	N/A	Y	16	4
Denver International (DEN)	Runway 17R approach area on Taxiway ED	DEN-HS1	ANM	Large	N/A	Y	13	4
Des Moines International (DSM)	Intersection of Runway 13-31 /Runway 5-23	DSM-HS1	ACE	Small	N/A	Y	14	4
Phoenix Deer Valley (DVT)	Approach end of Runway 7R	DVT-07	AWP	Reliever	National	N	9	3
Phoenix Deer Valley (DVT)	Hold short bar on Taxiway A4 at approach end of Runway 7L	DVT-12	AWP	Reliever	National	N	11	3
Phoenix Deer Valley (DVT)	Taxiway B5 between Taxiway B and Runway 7R-25L	DVT-HS1	AWP	Reliever	National	N	11	3
Phoenix Deer Valley (DVT)	Runway 7R-25L/Taxiway B9 intersection	DVT-HS2	AWP	Reliever	National	N	26	5
David Wayne Hooks Memorial (DWH)	Runway 17R approach end	DWH-HS1	ASW	Reliever	Regional	N	20	5
David Wayne Hooks Memorial (DWH)	Intersection of Taxiway G and Runway 17L/35R	DWH-HS4	ASW	Reliever	Regional	N	3	3

\*U.S. Federal Register, Title 14 Code of Federal Regulations Part 139, "Airport Certification," Government Printing Office, Washington, DC, 2004.

The RIM Program Inventory of Airport Locations as of December 2018 (Continued)

Airport Name	Location	Location Identifier	Region	NPIAS Hub Classification	Asset Category	Part 139*	Cumulative RI (PD and V/PD)	Peak CY Annual RI (PD and V/PD)
Fairbanks International (FAI)	Runway 20L approach end/Runway 2 Ski Strip	FAI-11	AAL	Small	N/A	Y	8	3
Fairbanks International (FAI)	Approach end of Ski Strip 20	FAI-25	AAL	Small	N/A	Y	3	3
Fairbanks International (FAI)	Closely located Taxiways (B, T, U) and Runways (approach ends of 20L and 2)	FAI-HS1	AAL	Small	N/A	Y	16	4
Fresno Yosemite International (FAT)	Runway 29R approach end	FAT-21	AWP	Small	N/A	Y	10	3
Flying Cloud (FCM)	Runway 28L approach end	FCM-HS10	AGL	Reliever	National	N	9	2
Falcon Field (FFZ)	Approach end of Runway 22L	FFZ-13	AWP	Reliever	Regional	N	16	3
Fulton County Airport-Brown Field (FTY)	Runway 8-26/Taxiway K intersection	FTY-04	ASO	Reliever	National	N	4	4
Scholes International (GLS)	Runway 18/Taxiway E intersection	GLS-04	ASW	Reliever	Regional	N	10	4
Portland-Hillsboro (HIO)	Hold short bar on Taxiway A9 at the approach end of Runway 31L	HIO-05	ANM	Reliever	National	N	11	3
Portland-Hillsboro (HIO)	Intersection of Taxiways A and A6 and Runway 13R/31L	HIO-HS1	ANM	Reliever	National	N	4	3
Portland-Hillsboro (HIO)	Taxiway A8 between Taxiway A and Runway 13R/31L	HIO-HS2	ANM	Reliever	National	N	12	4
Helena Regional (HLN)	Intersection of Taxiway C and approach end of Runway 35	HLN-01	ANM	Non-hub primary	N/A	Y	10	3

\*U.S. Federal Register, Title 14 Code of Federal Regulations Part 139, "Airport Certification," Government Printing Office, Washington, DC, 2004.

The RIM Program Inventory of Airport Locations as of December 2018 (Continued)

Airport Name	Location	Location Identifier	Region	NPIAS Hub Classification	Asset Category	Part 139*	Cumulative RI (PD and V/PD)	Peak CY Annual RI (PD and V/PD)
Daniel K. Inouye International (HNL)	Taxiway E between Runways 4L/22R and 4R/22L	HNL-01	AWP	Large	N/A	Y	11	3
Daniel K. Inouye International (HNL)	Taxiway D between Runway 22L/4R and 22R/4L	HNL-02	AWP	Large	N/A	Y	17	4
Daniel K. Inouye International (HNL)	Approach end of Runway 4R	HNL-27	AWP	Large	N/A	Y	15	3
Daniel K. Inouye International (HNL)	Runway 4L and 4R approach ends	HNL-HS1	AWP	Large	N/A	Y	19	6
Daniel K. Inouye International (HNL)	Runway 8L/26R, Taxiway E, Taxiway B	HNL-HS3	AWP	Large	N/A	Y	9	3
Daniel K. Inouye International (HNL)	Runway 8L approach/ Taxiways A, V, T, RB, and M intersection	HNL-HS4	AWP	Large	N/A	Y	15	4
Daniel K. Inouye International (HNL)	Taxiways E, D, and F between Runways 4L/22R and 4R/22L	HNL-HS6	AWP	Large	N/A	Y	5	3
William P Hobby (HOU)	Runway 17 Taxiway E entrance	HOU-01	ASW	Medium	N/A	Y	7	3

\*U.S. Federal Register, Title 14 Code of Federal Regulations Part 139, "Airport Certification," Government Printing Office, Washington, DC, 2004.

The RIM Program Inventory of Airport Locations as of December 2018 (Continued)

Airport Name	Location	Location Identifier	Region	NPIAS Hub Classification	Asset Category	Part 139*	Cumulative RI (PD and V/PD)	Peak CY Annual RI (PD and V/PD)
William P Hobby (HOU)	Hold short bar on Taxiway G at approach end of Runway 4	HOU-15	ASW	Medium	N/A	Y	7	3
William P Hobby (HOU)	Runway 13R/Taxiway G entrance	HOU-HS2	ASW	Medium	N/A	Y	13	4
Hayward Executive (HWD)	Runway 28L/Taxiway A1 Intersection	HWD-HS5	AWP	Reliever	National	N	32	13
Idaho Falls Regional (IDA)	Runway 20/Runway 17 approach ends	IDA-HS4	ANM	Non-hub primary	N/A	Y	12	5
Phoenix-Mesa Gateway (IWA)	Runway 12C	IWA-04	AWP	Small	N/A	Y	8	2
Phoenix-Mesa Gateway (IWA)	Taxiways V, B, and K/Runway 12R intersection	IWA-HS1	AWP	Small	N/A	Y	10	3
Joplin Regional (JLN)	ILS hold line and hold short bar on Taxiway E at approach end of Runway 13	JLN-HS1	ACE	Non-hub primary	Regional	N/A	10	3
Juneau International (JNU)	Runway 8-26/Taxiway D intersection	JNU-01	AAL	Non-hub primary	N/A	Y	9	3
McCarran International (LAS)	Runway 8L/1L intersection	LAS-HS4	AWP	Large	N/A	Y	19	4
Los Angeles International (LAX)	Hold short bar on Taxiway G south of Runway 7R/25L	LAX-21	AWP	Large	N/A	Y	5	4
Los Angeles International (LAX)	Runway 6R-24L/Taxiway AA intersection	LAX-HS1	AWP	Large	N/A	Y	18	4
Los Angeles International (LAX)	Runway 7L-25R/7R-25L/Taxiway F intersection	LAX-HS3	AWP	Large	N/A	Y	26	5

\*U.S. Federal Register, Title 14 Code of Federal Regulations Part 139, "Airport Certification," Government Printing Office, Washington, DC, 2004.

The RIM Program Inventory of Airport Locations as of December 2018 (Continued)

Airport Name	Location	Location Identifier	Region	NPIAS Hub Classification	Asset Category	Part 139*	Cumulative RI (PD and V/PD)	Peak CY Annual RI (PD and V/PD)
Lafayette Regional (LFT)	Intersections of Runway 4L/22R and Taxiway B and Runway 11/29 and Taxiways F and J	LFT-HS2	ASW	Non-hub primary	N/A	Y	10	3
Long Beach (LGB)	Taxiway J-D/Runway 8R-26L/Runway 12-30 intersection	LGB-HS3	AWP	Small	N/A	Y	12	3
Long Beach (LGB)	Runway 26L approach/ Taxiways D and F intersection	LGB-35	AWP	Small	N/A	Y	8	4
Bowman Regional (LOU)	Runway 6-24/Taxiway J intersection	LOU-01	ASO	Reliever	Regional	N	5	3
Livermore Municipal (LVK)	Runway 25R/Taxiway B intersection	LVK-HS1	AWP	Reliever	Regional	N	26	6
Livermore Municipal (LVK)	Runway 25L/Taxiway C intersection	LVK-HS2	AWP	Reliever	Regional	N	18	5
Midland International Air and Space Port (MAF)	Runway 10/Taxiway A intersection	MAF-HS2	ASW	Small	N/A	Y	13	6
Memphis International (MEM)	Runway 27/Taxiway V2 intersection	MEM-01	ASO	Small	N/A	Y	3	3
Manchester-Boston Regional (MHT)	Runway 17/Taxiway H intersection	MHT-HS1	ANE	Small	N/A	Y	15	10
Manchester-Boston Regional (MHT)	Runway 35/Taxiway U/Taxiway P intersection	MHT-HS2	ANE	Small	N/A	Y	6	2
Miami International (MIA)	Runway 8R-26L/Taxiway M5 intersection	MIA-HS1	ASO	Large	N/A	Y	5	3

\*U.S. Federal Register, Title 14 Code of Federal Regulations Part 139, "Airport Certification," Government Printing Office, Washington, DC, 2004.

The RIM Program Inventory of Airport Locations as of December 2018 (Continued)

Airport Name	Location	Location Identifier	Region	NPIAS Hub Classification	Asset Category	Part 139*	Cumulative RI (PD and V/PD)	Peak CY Annual RI (PD and V/PD)
Miami International (MIA)	Runway 9-27/Runway T5 intersection	MIA-HS3	ASO	Large	N/A	Y	9	4
Miami International (MIA)	Runway 8R-26L/12-30/Taxiway N/M/M1/Q1/Q/P intersection	MIA-HS4	ASO	Large	N/A	Y	12	3
Crystal (MIC)	Taxiway E4 between Runway 14R and 14L	MIC-HS6	AGL	Reliever	Regional	N	14	4
Quad City International (MLI)	Runway 13-31/9-27/5-23 intersection	MLI-HS2	AGL	Non-hub primary	N/A	Y	11	8
Monroe Regional (MLU)	Taxiway A between Runways 14 and 18	MLU-HS1	ASW	Non-hub primary	N/A	Y	6	4
Merrill Field (MRI)	Runway 7-25/Taxiway C intersection	MRI-13	AAL	Non-hub primary	N/A	N	14	4
Merrill Field (MRI)	Runway 25/Taxiway K intersection	MRI-25	AAL	Non-hub primary	N/A	N	13	3
Merrill Field (MRI)	Runway 5-23/Taxiway G intersection	MRI-26	AAL	Non-hub primary	N/A	N	13	5
Louis Armstrong New Orleans International (MSY)	Runway 11-29/Taxiway F intersection	MSY-HS1	ASW	Medium	N/A	Y	5	3
Montgomery-Gibbs Executive (MYF)	Taxiway A at approach end of Runway 28R	MYF-01	AWP	Reliever	Regional	N	10	3
Montgomery-Gibbs Executive (MYF)	Taxiway H hold bar between approach ends of Runway 5 and Runway 10R	MYF-13	AWP	Reliever	Regional	N	6	4
Montgomery-Gibbs Executive (MYF)	Approach end of Runway 28R	MYF-15	AWP	Reliever	Regional	N	10	6
Montgomery-Gibbs Executive (MYF)	Taxiway F between Runways 10L/28R and 10R/28L	MYF-HS2	AWP	Reliever	Regional	N	10	9

\*U.S. Federal Register, Title 14 Code of Federal Regulations Part 139, "Airport Certification," Government Printing Office, Washington, DC, 2004.



The RIM Program Inventory of Airport Locations as of December 2018 (Continued)

Airport Name	Location	Location Identifier	Region	NPIAS Hub Classification	Asset Category	Part 139*	Cumulative RI (PD and V/PD)	Peak CY Annual RI (PD and V/PD)
Montgomery-Gibbs Executive (MYF)	Runway 28L/Taxiway B intersection	MYF-HS3	AWP	Reliever	Regional	N	12	5
Lakefront (NEW)	Hold short bar on Taxiway F at approach end of Runway 36L	NEW-HS3	ASW	Reliever	National	N	20	11
Chicago O'Hare International (ORD)	Taxiway T/Taxiway SS/ approach path Runway 9R	ORD-HS2	AGL	Large	N/A	Y	7	6
Executive (ORL)	Runway 7/Taxiway E4 intersection	ORL-01	ASO	Reliever	National	N	11	3
Palo Alto (PAO)	Runway 31/Taxiway A intersection	PAO-01	AWP	Reliever	Regional	N	35	7
DeKalb-Peachtree (PDK)	Runway 16-34/3L-21R/3R-21L/Taxiway C / B intersection	PDK-11	ASO	Reliever	National	N	12	4
DeKalb-Peachtree (PDK)	Runway 21R/Taxiway G intersection	PDK-HS1	ASO	Reliever	National	N	14	4
DeKalb-Peachtree (PDK)	Runway 3L/Taxiway A intersection	PDK-HS3	ASO	Reliever	National	N	9	4
Phoenix Sky Harbor International (PHX)	Runway 25R	PHX-02	AWP	Large	N/A	Y	5	2
St Petersburg-Clearwater International (PIE)	Hold short bar on Taxiway A, north of approach end of Runway 4	PIE-05	ASO	Small	N/A	Y	4	3
Pensacola International (PNS)	Intersections of Runway 8/26, 17/35, and Taxiways A, B, and D	PNS-HS1	ASO	Small	N/A	Y	13	5
Brackett Field (POC)	Runway 8L-26R/Taxiway E intersection	POC-02	AWP	Reliever	Regional	N	9	2

\*U.S. Federal Register, Title 14 Code of Federal Regulations Part 139, "Airport Certification," Government Printing Office, Washington, DC, 2004.

The RIM Program Inventory of Airport Locations as of December 2018 (Continued)

Airport Name	Location	Location Identifier	Region	NPIAS Hub Classification	Asset Category	Part 139*	Cumulative RI (PD and V/PD)	Peak CY Annual RI (PD and V/PD)
Ernest A. Love Field (PRC)	Runway 3L approach end	PRC-HS3	AWP	Non-primary commercial	Regional	Y	18	4
Ernest A. Love Field (PRC)	Runway 3R-21L/Taxiway C4-D4 intersection	PRC-HS4	AWP	Non-primary commercial	Regional	Y	9	4
Palm Springs International (PSP)	Runway 31R/Taxiway B intersection	PSP-HS3	AWP	Small	N/A	Y	9	3
Reid-Hillview (RHV)	Taxiway E between Runway 13L and 13R	RHV-01	AWP	Reliever	Regional	N	14	4
Reid-Hillview (RHV)	Runway 31R Approach/Taxiway A intersection	RHV-HS2	AWP	Reliever	Regional	N	12	3
Reno-Tahoe International (RNO)	Runway 34L approach end	RNO-18	AWP	Small	N/A	Y	9	5
Reno-Tahoe International (RNO)	Intersection of Taxiway L and Runway 16L/34R and Taxiway C and Runway 7/25	RNO-HS2	AWP	Small	N/A	Y	15	5
San Antonio International (SAT)	Runway 4-22/13R-31L intersection	SAT-HS1	ASW	Medium	N/A	Y	29	10
San Antonio International (SAT)	Runway 13R/Taxiway K intersection	SAT-05	ASW	Medium	N/A	Y	11	6
Brown Field Municipal (SDM)	Taxiway B between Runways 8L/26R and 8R/26L	SDM-04	AWP	Reliever	National	N	4	4
Seattle-Tacoma International (SEA)	Runway 16L/Taxiway C intersection	SEA-02	ANM	Large	N/A	Y	5	3
Orlando Sanford International (SFB)	Runway 9R-27L/Runway 18-36 intersection	SFB-05	ASO	Small	N/A	Y	8	2
Orlando Sanford International (SFB)	Runway 9R/Runway R intersection	SFB-HS2	ASO	Small	N/A	Y	17	5

\*U.S. Federal Register, Title 14 Code of Federal Regulations Part 139, "Airport Certification," Government Printing Office, Washington, DC, 2004.

The RIM Program Inventory of Airport Locations as of December 2018 (Continued)

Airport Name	Location	Location Identifier	Region	NPIAS Hub Classification	Asset Category	Part 139*	Cumulative RI (PD and V/PD)	Peak CY Annual RI (PD and V/PD)
San Francisco International (SFO)	Taxiway T between Runway 10L-28R/Runway 10R-28L	SFO-HS3	AWP	Large	N/A	Y	15	4
Norman Y. Mineta San Jose International (SJC)	Runway 30R	SJC-28	AWP	Medium	N/A	Y	5	2
Norman Y. Mineta San Jose International (SJC)	Runway 30L	SJC-29	AWP	Medium	N/A	Y	6	3
Salt Lake City International (SLC)	Runway 35/Runway 32/ Taxiway K1/Taxiway M intersection	SLC-HS1	ANM	Large	N/A	Y	28	11
Salt Lake City International (SLC)	Runway 34R-16L/14-32/ Taxiway Q Intersection	SLC-HS2	ANM	Large	N/A	Y	13	3
John Wayne (SNA)	Taxiway L between Runway 20L and 20R approach ends	SNA-03	AWP	Medium	N/A	Y	6	3
John Wayne (SNA)	Taxiway L entrance to Runway 20L	SNA-HS1	AWP	Medium	N/A	Y	10	3
John Wayne (SNA)	Taxiway H between Runway 2L-20R and Runway 2R approach	SNA-HS2	AWP	Medium	N/A	Y	13	6
Abraham Lincoln Capital (SPI)	Runway 13-31/18-36/4-22 intersections	SPI-HS1	AGL	Non-hub primary	N/A	Y	7	3
Sarasota-Bradenton International (SRQ)	Runway 14-32/4-22/Taxiway A, B, C, D intersections	SRQ-HS1	ASO	Small	N/A	Y	31	7
Charles M. Schulz - Sonoma County (STS)	Taxiway A/approach path of Runway 20	STS-08	AWP	Non-hub primary	N/A	Y	9	5

\*U.S. Federal Register, Title 14 Code of Federal Regulations Part 139, "Airport Certification," Government Printing Office, Washington, DC, 2004.

The RIM Program Inventory of Airport Locations as of December 2018 (Continued)

Airport Name	Location	Location Identifier	Region	NPIAS Hub Classification	Asset Category	Part 139*	Cumulative RI (PD and V/PD)	Peak CY Annual RI (PD and V/PD)
Charles M. Schulz - Sonoma County (STS)	Run-up area east of Taxiway A, Taxiway H at approach end of Runway 20, Taxiway A3 at Runway 14/32	STS-HS3	AWP	Non-hub primary	N/A	Y	15	8
Teterboro (TEB)	Intersection of Taxiway L and Runway 6/24	TEB-HS1	AEA	Reliever	National	Y	7	3
Miami Executive (TMB)	Runway 9L/Taxiway A intersection	TMB-04	ASO	Reliever	National	N	17	4
Miami Executive (TMB)	Runway 31/Taxiway E, H intersection	TMB-HS1	ASO	Reliever	National	N	12	3
Tucson International (TUS)	Runway 29R approach end	TUS-03	AWP	Small	N/A	Y	11	3
Tucson International (TUS)	Taxiway D between Runway 11L and 11R	TUS-HS2	AWP	Small	N/A	Y	42	10
Aurora State (UAO)	Taxiway A1 at Runway 17 approach end	UAO-01	ANM	General aviation	National	N	6	5
North Las Vegas (VGT)	Taxiway F/G at Runway 7 approach end	VGT-HS1	AWP	Non-hub primary	N/A	Y	46	12
North Las Vegas (VGT)	Runway 12R/Taxiway G	VGT-HS2	AWP	Non-hub primary	N/A	Y	24	7
Van Nuys (VNY)	Taxiway C and approach Runway 16L	VNY-02	AWP	Reliever	National	N	9	3

\*U.S. Federal Register, Title 14 Code of Federal Regulations Part 139, "Airport Certification," Government Printing Office, Washington, DC, 2004.

For reference purposes, table A-2 provides the FAA Airport Code Identifiers for the airport covered in this appendix. Table A-3 shows the FAA Regional abbreviations and the U.S. territories covered in each region.

Table A-2. The FAA Airport Identifier Codes

FAA Identifier Code	Airport Name and Location
ABQ	Albuquerque International Sunport Airport, Albuquerque, New Mexico
ACT	Waco Regional Airport , Waco, Texas
ADS	Addison Airport, Dallas, Texas
APA	Centennial Airport, Denver, Colorado
ATL	Hartsfield–Jackson Atlanta International Airport, Atlanta, Georgia
AZO	Kalamazoo/Battle Creek International, Kalamazoo, Michigan
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
CCR	Buchanan Field Airport, Concord, California
CLE	Cleveland Hopkins International Airport , Cleveland, Ohio
CLT	Charlotte/Douglas International Airport, Charlotte, North Carolina
CMA	Camarillo Airport, Camarillo, California
CNO	Chino Airport , Chino, California
CRP	Corpus Christi International Airport, Corpus Christi, Texas
CRQ	Mc Clellan-Palomar Airport, Carlsbad, California
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
FAI	Fairbanks International Airport, Fairbanks, Alaska
FAT	Fresno Yosemite International Airport, Fresno, California
FCM	Flying Cloud Airport, Minneapolis, Minnesota

Table A-2. The FAA Airport Identifier Codes (Continued)

FAA Identifier Code	Airport Name and Location
FDK	Frederick Municipal Airport, Frederick, Maryland
FFZ	Falcon Field Airport, Mesa, Arizona
FTY	Fulton County Airport-Brown Field, Atlanta, Georgia
FXE	Fort Lauderdale Executive Airport, Fort Lauderdale, Florida
GLS	Scholes International Airport, Galveston, Texas
HIO	Portland-Hillsboro Airport, Portland, Oregon
HLN	Helena Regional Airport, Helena, Montana
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, Alameda County, California
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
LAS	McCarran International Airport, Las Vegas, Nevada
LAX	Los Angeles International Airport, Los Angeles, California
LFT	Lafayette Regional Airport, Lafayette, Louisiana
LGB	Long Beach Airport/Daughtry Field, Long Beach, California
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
MHT	Manchester-Boston Regional Airport, Manchester, New Hampshire
MIA	Miami International Airport, Miami, Florida
MIC	Crystal Airport, Minneapolis, Minnesota
MLI	Quad City Airport, Moline, Illinois
MLU	Monroe Regional Airport, Monroe, Louisiana
MRI	Merrill Field, Anchorage, Alaska
MSY	Louis Armstrong New Orleans International Airport, New Orleans, Louisiana
MYF	Montgomery-Gibbs Executive Airport, San Diego, California
NEW	Lakefront Airport, New Orleans, Louisiana
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, Palm Beach, Florida
PDK	DeKalb-Peachtree Airport, Atlanta, Georgia
PHL	Philadelphia International Airport, Philadelphia, Pennsylvania

Table A-2. The FAA Airport Identifier Codes (Continued)

FAA Identifier Code	Airport Name and Location
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
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
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. Schultz-Sonoma County Airport, Santa Rosa, California
TEB	Teterboro Airport, Teterboro, New Jersey
TMB	Miami Executive Airport, Miami, Florida
TUL	Tulsa International Airport, Tulsa, Oklahoma
TUS	Tucson International Airport, Tucson, Arizona
UAO	Aurora State Airport, Aurora, Oregon
VGT	North Las Vegas Airport, Las Vegas, Nevada
VNY	Van Nuys Airport, Van Nuys, California

Table A-3. The FAA Region Codes and the U.S. Territories Covered Within Each Region

FAA Regional Code	Region Name and U.S. Territories Covered
AAL	Alaskan (Alaska)
ACE	Central (Iowa, Kansas, Missouri, and Nebraska)
AEA	Eastern (DC, Delaware, Maryland, New Jersey, New York, Pennsylvania, Virginia, and West Virginia)
AGL	Great Lakes (Illinois, Indiana, Missouri, Minnesota, North Dakota, Ohio, South Dakota, and Wisconsin)
ANE	New England (Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, and Vermont)
ANM	Northwest Mountain (Colorado, Idaho, Montana, Oregon, Utah, Washington, and Wyoming)
ASO	Southern (Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, Puerto Rico, South Carolina, Tennessee, and U.S. Virgin Islands)
ASW	Southwest (Arkansas, Louisiana, Oklahoma, New Mexico, and Texas)
AWP	Western-Pacific (Arizona, California, Hawaii, Nevada, Guam, American Samoa, and Marshall Islands)



APPENDIX B—RUNWAY INCURSION MITIGATION LOCATIONS REMOVED  
FROM INVENTORY

Table B-1 shows the summary of runway incursion mitigation (RIM) mitigated locations, runway incursion (RI) pilot deviation (PD) and vehicle/pedestrian deviation (V/PD) totals for years 2007 to 2017, RI totals before and after mitigation, and average RIs per year before and after mitigation. Locations mitigated in fiscal year 2018 are highlighted in the Date Complete column. In the Runway Incursion (PD and V/PD) 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 B-1. The RIM Mitigated Locations Summary

RIM-Mitigated Locations					RI (PD and V/PD) Totals Per Year												RI (PD and V/PD) Totals		Average RIs (PD and V/PD) Per Year	
Region	Airport Name	ID	Mitigation Type	Date Complete	2	2	2	2	2	2	2	2	2	2	2	2	Mitigation			
					0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Before
AEA	Frederick Municipal	FDK-HS3	Signage, marking, and/or lighting	07/10/2015	0	0	0	0	0	0	0	0	1	4	0	0	5	0	0.63	0.00
AEA	Philadelphia International	PHL-01	Signage, marking, and/or lighting; operational/procedural	07/27/2017	0	0	2	0	2	1	1	0	0	0	0	1	6	1	0.67	N/A
AEA	Philadelphia International	PHL-HS1	Signage, marking, and/or lighting	08/24/2017	1	2	1	1	0	1	0	0	0	0	1	0	7	0	0.78	N/A
AEA	Teterboro	TEB-HS1	Taxiway/runway geometry reconfiguration	07/02/2018	0	0	0	0	1	3	1	1	0	0	0	1	7	N/A	0.70	N/A
AGL	Terre Haute Regional	HUF-HS1	Taxiway/runway geometry reconfiguration	12/10/2017	0	0	0	0	0	0	2	0	1	8	0	11	0	1.10	N/A	
AGL	Chicago Midway International	MDW-03	Signage, marking, and/or lighting	05/09/2016	0	0	1	0	0	3	0	1	0	0	0	5	0	0.56	0.00	

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Table B-1. The RIM Mitigated Locations Summary (Continued)

RIM-Mitigated Locations					RI (PD and V/PD) Totals Per Year												RI (PD and V/PD) Totals		Average RIs (PD and V/PD) Per Year	
Region	Airport Name	ID	Mitigation Type	Date Complete	2	2	2	2	2	2	2	2	2	2	2	2	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	Before	After	Before	After	
ANM	Centennial	APA-07	Operational/procedural	03/14/2017	0	0	0	0	3	0	0	0	2	0	1	6	0	0.60	N/A	
ANM	Centennial	APA-19	Signage, marking, and/or lighting	08/31/2017	0	0	0	1	2	0	0	2	4	8	2	19	0	1.90	N/A	
ANM	Centennial	APA-HS1	Taxiway/runway geometry reconfiguration; other	03/09/2016	0	3	2	2	3	1	2	1	4	0	1	18	1	2.00	1.00	
ANM	Rocky Mountain Metropolitan	BJC-02	Operational/procedural	05/23/2018	0	0	0	1	2	1	2	0	1	0	0	7	N/A	0.70	N/A	
ANM	Seattle-Tacoma International	SEA-26	Operational/procedural	08/10/2018	0	1	0	1	0	0	0	4	0	0	0	6	N/A	0.60	N/A	
ANM	Seattle-Tacoma International	SEA-HS1	Signage, marking, and/or lighting	04/29/2018	0	1	2	2	0	1	1	1	0	0	0	8	N/A	0.80	N/A	
ASO	Charlotte/Douglas International	CLT-06	Operational/procedural	06/18/2015	0	0	0	0	4	0	1	0	0	0	0	5	0	0.63	0.00	

Table B-1. The RIM Mitigated Locations Summary (Continued)

RIM-Mitigated Locations					RI (PD and V/PD) Totals Per Year												RI (PD and V/PD) Totals			
Region	Airport Name	ID	Mitigation Type	Date Complete	2	2	2	2	2	2	2	2	2	2	2	2	Mitigation			
					0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Before
ASO	Daytona Beach International	DAB-02	Taxiway/runway geometry reconfiguration	08/04/2018	0	0	1	0	1	0	3	1	0	0	0	6	6	N/A	0.60	N/A
ASO	Fort Lauderdale Executive	FXE-08	Signage, markings, and/or lighting	02/16/2017	0	1	0	3	0	0	0	0	0	0	0	4	4	0	0.44	N/A
ASO	Fort Lauderdale Executive	FXE-HS1	Signage, markings, and/or lighting	02/16/2017	0	2	1	1	0	3	3	3	4	0	0	17	17	0	1.89	N/A
ASO	Fort Lauderdale Executive	FXE-HS2	Signage, markings, and/or lighting	02/16/2017	0	0	1	0	3	0	5	1	1	2	0	13	13	0	1.44	N/A
ASO	Kissimmee Gateway	ISM-02	Signage, markings, and/or lighting	07/31/2018	0	0	0	0	0	3	0	0	0	0	0	3	3	N/A	0.30	N/A
ASO	Palm Beach International	PBI-02	Taxiway/runway geometry reconfiguration; signage, markings, and/or lighting	09/01/2017	0	0	3	0	0	0	0	0	0	0	0	3	3	0	0.30	N/A

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Table B-1. The RIM Mitigated Locations Summary (Continued)

RIM-Mitigated Locations					RI (PD and V/PD) Totals Per Year										RI (PD and V/PD) Totals					
Region	Airport Name	ID	Mitigation Type	Date Complete	2	2	2	2	2	2	2	2	2	2	2	2	Mitigation			
					0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Before
					7	8	9	0	1	2	3	4	5	6	7					
ASO	Palm Beach International	PBI-HS1	Signage, markings, and/or lighting	02/03/2017	1	1	1	0	0	2	5	1	0	0	1	11	1	1.22	N/A	
ASW	Albuquerque International Sunport	ABQ-HS1	Taxiway/runway geometry reconfiguration	05/11/2018	0	1	0	2	1	2	2	2	1	0	0	11	N/A	1.10	N/A	
ASW	Waco Regional	ACT-04	Taxiway/runway geometry reconfiguration; operational/procedural	10/10/2016	0	0	0	0	0	1	0	0	0	0	0	1	0	0.11	0.00	
ASW	Corpus Christi International	CRP-HS1	Taxiway/runway geometry reconfiguration	05/26/2016	0	1	6	2	2	2	1	1	0	0	0	15	0	1.67	0.00	
ASW	Dallas Love Field	DAL-14	Signage, marking, and/or lighting	11/01/2016	0	1	6	3	1	0	3	5	3	5	3	27	3	3.00	3.00	
ASW	Dallas Love Field	DAL-HS1	Signage, marking, and/or lighting	04/01/2017	0	2	0	0	0	0	12	6	6	3	1	29	1	3.22	N/A	

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Table B-1. The RIM Mitigated Locations Summary (Continued)

RIM-Mitigated Locations					RI (PD and V/PD) Totals Per Year												RI (PD and V/PD) Totals			
Region	Airport Name	ID	Mitigation Type	Date Complete	2	2	2	2	2	2	2	2	2	2	2	2	Mitigation			
					0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Before
					7	8	9	0	1	2	3	4	5	6	7					
ASW	David Wayne Hooks Memorial	DWH-HS2	Signage, markings, and/or lighting; operational/procedural; taxiway/runway geometry reconfiguration	12/31/2016	1	0	1	1	1	1	7	5	14	9	1	40	1	4.44	1.00	
ASW	David Wayne Hooks Memorial	DWH-HS3	Signage, markings, and/or lighting	12/31/2016	0	1	0	2	0	1	0	3	7	0	2	14	2	1.56	2.00	
ASW	Tulsa International	TUL-HS1	Taxiway/runway geometry reconfiguration	08/01/2018	0	0	0	0	0	0	3	0	0	0	0	3	N/A	0.30	N/A	
AWP	Mc Clellan-Palomar	CRQ-03	Signage, marking, and/or lighting	03/31/2017	0	1	1	2	0	1	2	0	2	5	1	14	1	1.56	N/A	
AWP	Ernest A. Love Field	PRC-HS2	Taxiway/runway geometry reconfiguration	08/31/2018	0	0	2	0	0	3	2	1	2	1	0	11	N/A	1.10	N/A	
AWP	Reno-Tahoe International	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	5	0	0.63	0.00	

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Table B-1. The RIM Mitigated Locations Summary (Continued)

RIM-Mitigated Locations					RI (PD and V/PD) Totals Per Year										RI (PD and V/PD) Totals					
Region	Airport Name	ID	Mitigation Type	Date Complete	2	2	2	2	2	2	2	2	2	2	2	2	Mitigation			
					0	0	0	0	0	0	0	0	0	0	0	0	Before	After	Before	After
AWP	Santa Barbara Municipal	SBA-17	Signage, marking, and/or lighting	05/18/2016	0	3	1	2	1	1	0	0	1	0	0	9	0	1.00	0.00	
AWP	Santa Monica Municipal	SMO-02	Taxiway/runway geometry reconfiguration	12/22/2017	0	0	0	0	0	3	3	5	3	5	1	20	0	2.00	N/A	
Totals																366	11	1.20	0.64	

For reference purposes, table B-2 provides the Federal Aviation Administration (FAA) Airport Code Identifiers for the airport covered in this appendix. Table B-3 shows the FAA regional abbreviations and the U.S. territories covered in each region.

Table B-2. The FAA Airport Identifier Codes

FAA Identifier Code	Airport Name and Location
ABQ	Albuquerque International Sunport Airport, Albuquerque, New Mexico
ACT	Waco Regional Airport , Waco, Texas
ADS	Addison Airport, Dallas, Texas
APA	Centennial Airport, Denver, Colorado
ATL	Hartsfield–Jackson Atlanta International Airport, Atlanta, Georgia
AZO	Kalamazoo/Battle Creek International, Kalamazoo, Michigan
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
CCR	Buchanan Field Airport, Concord, California
CLE	Cleveland Hopkins International Airport , Cleveland, Ohio
CLT	Charlotte/Douglas International Airport, Charlotte, North Carolina
CMA	Camarillo Airport, Camarillo, California
CNO	Chino Airport , Chino, California
CRP	Corpus Christi International Airport, Corpus Christi, Texas
CRQ	Mc Clellan-Palomar Airport, Carlsbad, California
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
FAI	Fairbanks International Airport, Fairbanks, Alaska
FAT	Fresno Yosemite International Airport, Fresno, California



Table B-2. The FAA Airport Identifier Codes (Continued)

FAA Identifier Code	Airport Name and Location
FCM	Flying Cloud Airport, Minneapolis, Minnesota
FDK	Frederick Municipal Airport, Frederick, Maryland
FFZ	Falcon Field Airport, Mesa, Arizona
FTY	Fulton County Airport-Brown Field, Atlanta, Georgia
FXE	Fort Lauderdale Executive Airport, Fort Lauderdale, Florida
GLS	Scholes International Airport, Galveston, Texas
HIO	Portland-Hillsboro Airport, Portland, Oregon
HLN	Helena Regional Airport, Helena, Montana
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, Alameda County, California
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
LAS	McCarran International Airport, Las Vegas, Nevada
LAX	Los Angeles International Airport, Los Angeles, California
LFT	Lafayette Regional Airport, Lafayette, Louisiana
LGB	Long Beach Airport/Daughtry Field, Long Beach, California
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
MHT	Manchester-Boston Regional Airport, Manchester, New Hampshire
MIA	Miami International Airport, Miami, Florida
MIC	Crystal Airport, Minneapolis, Minnesota
MLI	Quad City Airport, Moline, Illinois
MLU	Monroe Regional Airport, Monroe, Louisiana
MRI	Merrill Field, Anchorage, Alaska
MSY	Louis Armstrong New Orleans International Airport, New Orleans, Louisiana
MYF	Montgomery-Gibbs Executive Airport, San Diego, California
NEW	Lakefront Airport, New Orleans, Louisiana
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, Palm Beach, Florida
PDK	DeKalb-Peachtree Airport, Atlanta, Georgia

Table B-2. The FAA Airport Identifier Codes (Continued)

FAA Identifier Code	Airport Name and Location
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
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
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. Schultz-Sonoma County Airport, Santa Rosa, California
TEB	Teterboro Airport, Teterboro, New Jersey
TMB	Miami Executive Airport, Miami, Florida
TUL	Tulsa International Airport, Tulsa, Oklahoma
TUS	Tucson International Airport, Tucson, Arizona
UAO	Aurora State Airport, Aurora, Oregon
VGT	North Las Vegas Airport, Las Vegas, Nevada
VNY	Van Nuys Airport, Van Nuys, California

Table B-3. The FAA Region Codes and the U.S. Territories Covered Within Each Region

FAA Regional Code	Region Name and U.S. Territories Covered
AAL	Alaskan (Alaska)
ACE	Central (Iowa, Kansas, Missouri, and Nebraska)
AEA	Eastern (DC, Delaware, Maryland, New Jersey, New York, Pennsylvania, Virginia, and West Virginia)
AGL	Great Lakes (Illinois, Indiana, Missouri, Minnesota, North Dakota, Ohio, South Dakota, and Wisconsin)
ANE	New England (Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, and Vermont)
ANM	Northwest Mountain (Colorado, Idaho, Montana, Oregon, Utah, Washington, and Wyoming)
ASO	Southern (Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, Puerto Rico, South Carolina, Tennessee, and U.S. Virgin Islands)
ASW	Southwest (Arkansas, Louisiana, Oklahoma, New Mexico, and Texas)
AWP	Western-Pacific (Arizona, California, Hawaii, Nevada, Guam, American Samoa, and Marshall Islands)