



**Federal Aviation
Administration**

RPA S1 – Airport Planning & Design

RPA S2 – Airport Safety Data Mining

Presented to: REDAC Subcommittee

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Date: March 20, 2018



RPA S1 – Airport Planning & Design

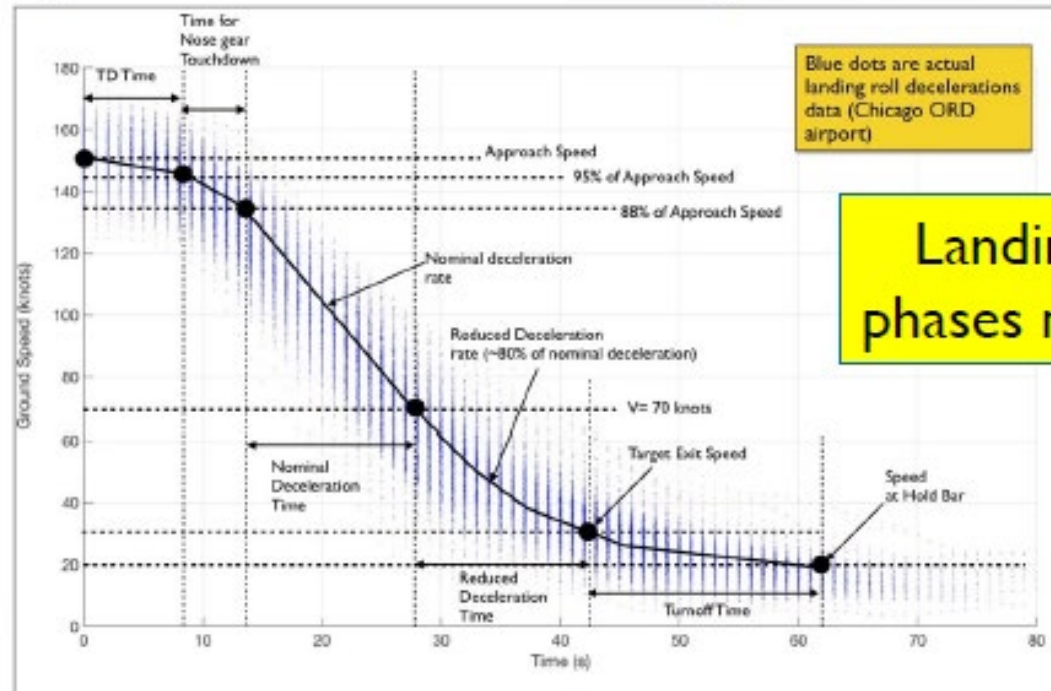
	FY16	FY17	FY18	FY19
RPA S1 - Airport Planning & Design				
S1.1 Airport Planning				
REDIM				
General Aviation Runway Length Tool (Phase 2/4)				
General Aviation Runway Length Tool (Phase 3/4)				
General Aviation Runway Length Tool (Phase 4/4)				
VFR Non-Towered Counts from Radar/ADS-B Data				
runwaySimulator				
Capacity Simulation (SIMMOD)				
Tree Growth Forecasts				
Indoor Navigation				
Update to ACRP Report 79 - Capacity Worksheet				
S1.2 Airport Design				
Taxiway Deviation (ADG-VI)				
Runway Deviation				
Spaceport Part 420 Gap Analysis				
S1.3 Runway Incursion Mitigation (RIM) Program				
RIM Data Collection & Analysis				
RIM Data Management Tool Support				
RIM Surface Capacity Analysis				
S1.4 Trapezoidal Groove Testing and Design				
Trapezoidal Groove Testing and Design				

RPA S1.1 – Airport Planning

REDIM

Progress Summary

- Continued development of first-order analysis of the new REDIM 3 algorithms (includes statistical distributions of nominal deceleration rates on the runway, approach speeds, exit speeds, etc.)
- Diagrams on the right illustrate sample analysis for a 3,600 m long runway
- Integration of weather information to airport data
- Started analysis of production runs of ASDE-X data for the following airports: ORD, DCA, LAX, SAN, DEN, IAD, LGA, EWR, MCO, PHX, SNA, SLC
- Performed an initial cluster analysis of landing roll parameters



Landing roll
phases modeled

Beta Version - March 2018

Final REDIM 3 Version – June 30, 2018

RPA S1.1 – Airport Planning

Indoor Navigation (Wayfinding for BVI Passengers)

- **Objective:**
 - Use technology to help Blind and Visually Impaired (BVI) passengers to navigate at airports.
- **Benefit of the Project:**
 - Help BVI travelers to navigate airport terminals independently
 - BVI travelers experience consistent airport navigation at all airports
- **Research Activities**
 - Grant with University of Minnesota – Published FAA Tech Note DOT/FAA/TC-TN16/54 “*Indoor Airport Wayfinding for Blind and Visually Impaired Travelers*” on December 2016.
 - Establishing CRDA with MIPsoft (Blindsquare Technology)
 - Field Trials at MSP (MOA in place)

RPA S1.1 – Airport Planning

VFR Non-Towered Airport Counts

- **Objective:**

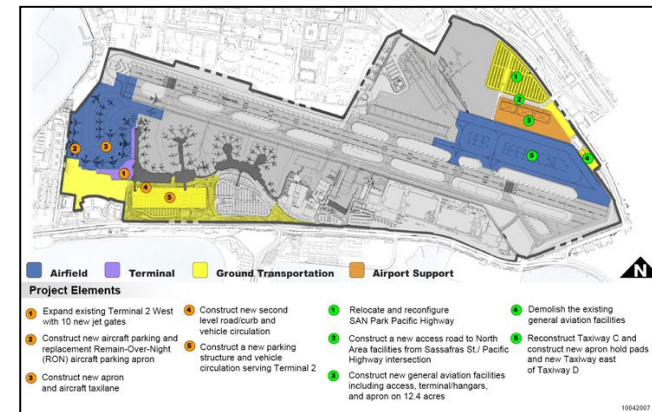
- Mature the development of simple, cost-effective technologies that an airport could deploy on its airfield to generate accurate, detailed operational counts.

- **Benefit of the Project:**

- Accurate airport counts for non-towered airports to use in development planning (forecasting, facility requirements, environmental)

- **Research Activities**

- PEGASAS COE Grant to develop and evaluate the performance of field deployable devices that monitor aircraft transponder data (Mode A/C, Mode S, ADS-B) to count operations at airports.



RPA S1.1 – Airport Planning

VFR Non-Towered Airport Counts

- **Evaluations at 4 airports:**
 - Purdue University Airport (LAF) – Current Installed
 - Terre Haute Regional Airport (HUF) – Planned Spring
 - Indy Executive Airport (TYQ) – Spring/Summer
 - Warsaw Municipal Airport (ASW) non-towered – Spring/Summer
- **Project will run through December 2018**



RPA S1.2 – Airport Design

Taxiway Centerline Deviation

- Recap - what's been done?
 - CRDA between the FAA and The Boeing Company
 - Data collection from 1999-2015 for ADGs V – I
 - Engineering Briefs 63A & B Published (2003 and 2007)
 - Draft Final Reports
- Next Steps
 - Focused studies (Completion date - December 2017)
 - Increased Wingspan for an ADG
 - Trends in Risk Values among ADGs
 - Changes in Fixed/Movable Object Clearances
 - Changes to Parallel Taxiway CL Separations
 - Changes to Taxiways Width
 - Boeing summary report

RPA S1.2 – Airport Design

Commercial Space Phase 1- Spaceports Gap Analysis

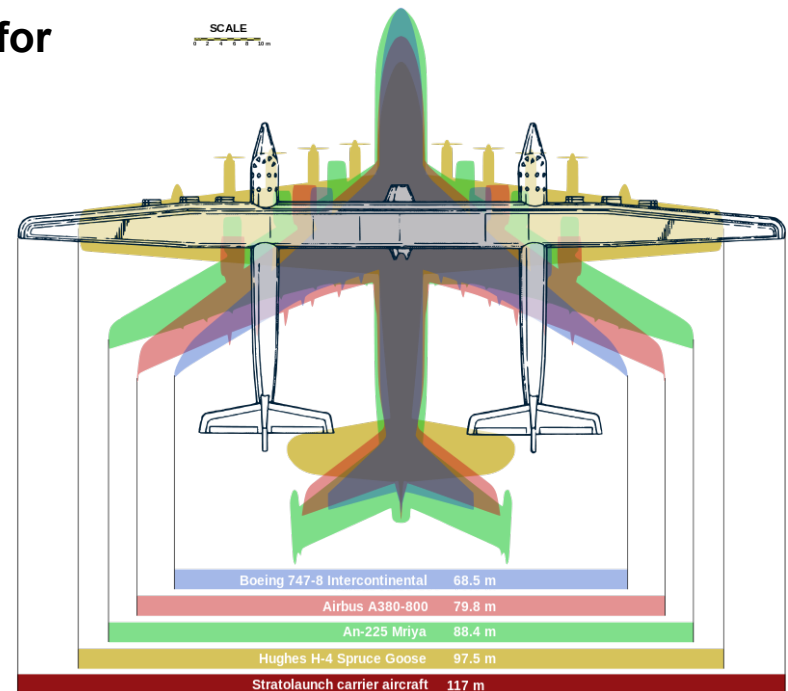
- Gap Analysis of FAA Office of Commercial Space (AST) launch site licensing standards (Part 420) and ARP standards (Part 139, advisory circulars, etc.)
- Analysis identified 16 potential gaps and impacts of commercial space launch and reentry operations not addressed sufficiently in current standards and regulations.

Topics Addressed	14 CFR Part 420	Airport Compliance Requirements	14 CFR Part 139
Public Protection	X	X	X
Coordination of Launch Operations	X		
Accident Investigation	X		
Explosive Site Planning	X		
Determination of Downrange Area Risk	X		
Risk Analysis of Flight Path	X		
Personnel Training			X
Maintenance of Paved Surfaces		X	X
Safety Areas		X	X
Signage, Marking, and Lighting		X	X
Snow and Ice Control			X
Aircraft Rescue and Firefighting			X
Emergency Response Planning and Training			X
Hazardous Materials Handling and Storage			X
Pedestrians and Ground Vehicles		X	X
Surface Condition Reporting		X	X
Obstruction Marking and Lighting		X	X
Airfield Inspections		X	X
Wildlife Hazard Management			X
Protection of NAVAIDS		X	X

RPA S1.2 – Airport Design

Commercial Space Phase 2 - Vehicle Profiles

- Investigation of current and future space operation vehicle profiles and performance characteristics for their effects on the airport facility.
- Characteristics include the following:
Runway requirements for takeoff and landing;
 - Runway width and crosswind limitations
 - Propellant types and quantities
 - Jet/Rocket blast characteristics
 - Physical dimensions and weights
 - Runway occupancy times
 - Taxiway maneuvering requirements
 - Planned takeoff and landing profiles
- Seventeen vehicles have been identified to be investigated.



RPA S1.2 – Airport Design

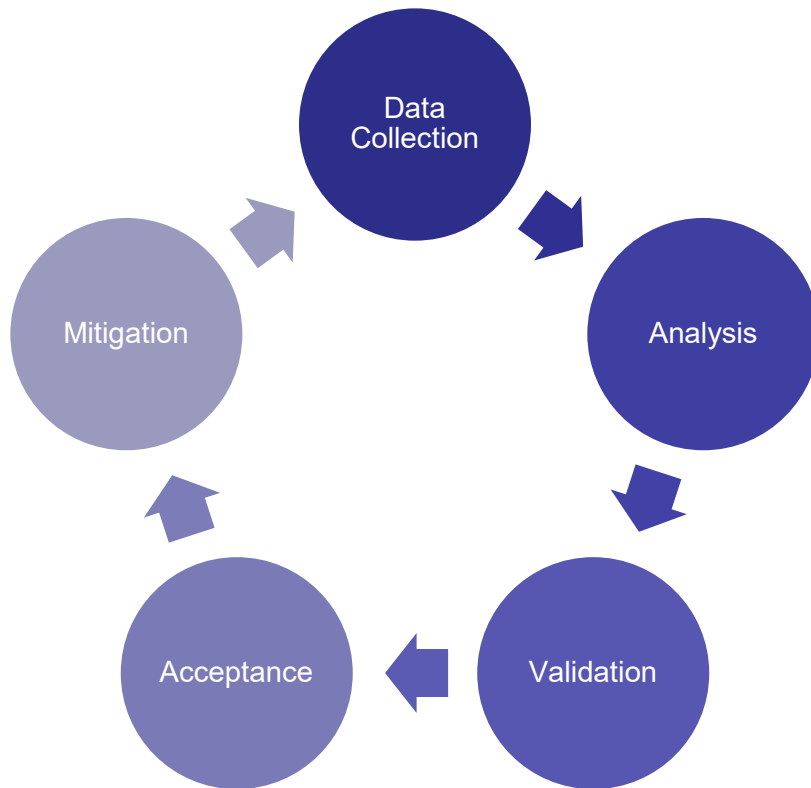
Commercial Space Next Steps

- **Phase 1:**
 - Regulatory analysis of AST launch site licensing standards (Part 420) and ARP standards (Part 139, advisory circulars, etc.)
 - Phase 1 Final Interim Report is under review by AAS-100 and AAS-300.
 - After review process is complete, report will be shared with AST.
- **Phase 2:**
 - Analysis of specific launch vehicle profiles and operating characteristics.
 - Phase 2 Final Interim Report expected to be completed in end of Spring 2018.
- **Final Report**
 - Scheduled to be completed at end of FY 18



RPA S1.3 – Runway Incursion Mitigation Program

RIM Data Collection & Analysis



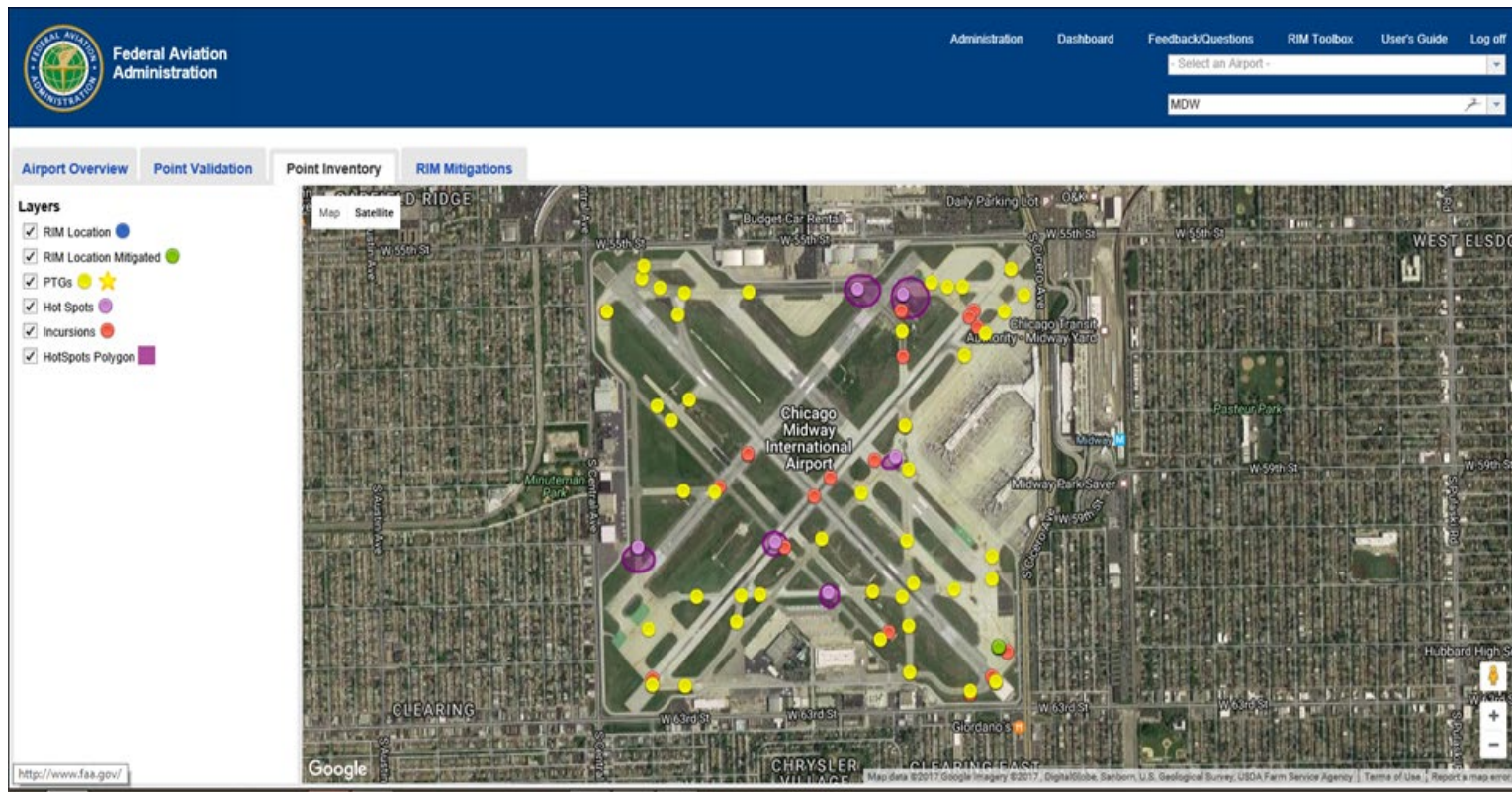
- CY16 Data:
 - Added 1265 Runway Incursions
 - Added 131 PTG Locations
 - 18 Locations added to RIM Inventory
- 132 RIM Locations as of Feb 2018 at 76 airports
- 20 Locations Mitigated to date

Next Steps:

- Complete 2017 RIM Database Update – 1,330 RIs

RPA S1.3 – Runway Incursion Mitigation Program

RIM Data Management Tool



DEMO

RPA S2 – Airport Safety Data Mining

RPA S2 - Airport Safety Data Mining				
S2.1 Airport Safety Data Mining				
Maintenance, Categorization, Analysis		FY16	FY17	FY18
				FY19

ASRS / NTSB / RI / PDS/VPDS / AIDS



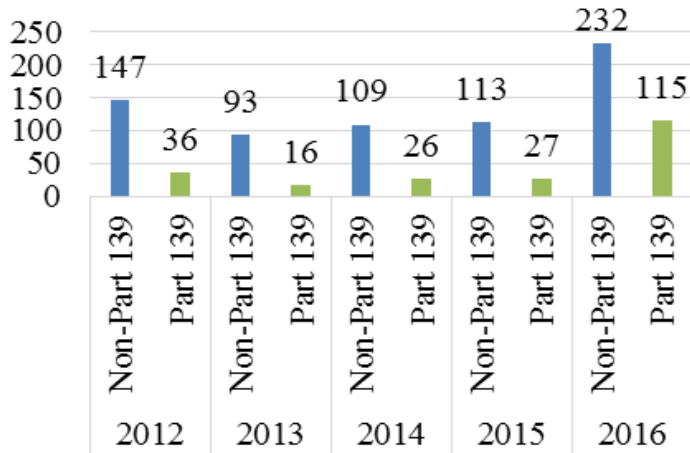
- 3,425 In-Scope Airports
 - ❖ 14 CFR Part 139 Airports
 - ❖ Public Use Primary and Non-Primary NPIAS Airports
 - ❖ All Public Towered Airports
- 84,192 Events (+26,561 since Aug '17)
- Airport Diagram Library
 - 2004 - Present
- Improved Categorization Methods

RPA S2 – Airport Safety Data Mining Capabilities

- **Data Requests**
- **Custom Queries**
- **Historical Airport Diagrams**
 - 2004 – Current
- **Focus Reports**
 - Analysis of Wrong Runway Takeoffs and Landings and Taxiway Takeoffs and Landings: FY 08 – FY 14
 - As requested from AAS-100
- **Annual Analysis Reports**
- **Quarterly Analysis Reports**

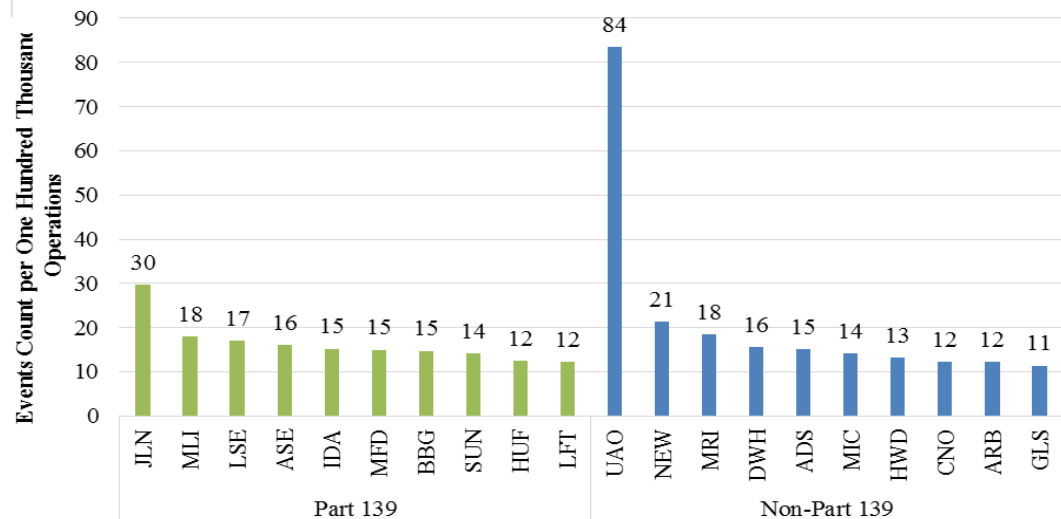
RPA S2 – Airport Safety Data Mining

Sample Findings - Annual



Number of Runway Excursion – Veer-Offs
Recorded in FY12-FY16

Top Part 139 and Non-Part 139 Airports in
Terms of Event Ratio in FY12 – FY16

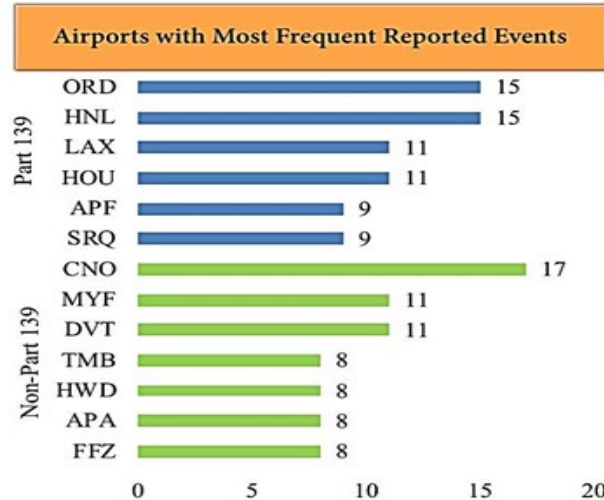


RPA S2 – Airport Safety Data Mining

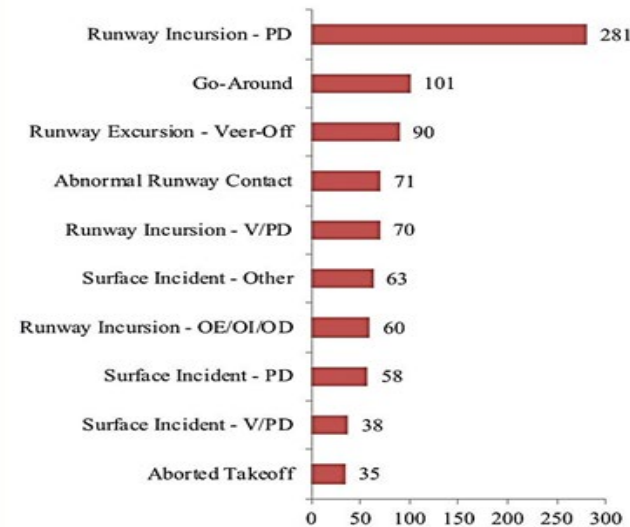
Sample Findings - Quarterly

QUARTERLY ANALYSIS SUMMARY Q1FY17

1,365	Reported Events
1,656	Identified Occurrences
765	Events After Exclusions
1,034	Occurrences After Exclusions



Distribution of Occurrence Types During Q1FY17



Questions?

