

**Minutes of the Air Traffic Procedures Advisory Committee (ATPAC) Meeting #152  
February 23-24, 2016**

**CGH Technologies, Inc.  
600 Maryland Ave SW, Suite 800W, Washington DC**

**1 Opening of the Meeting**

1.1 The 152nd Meeting of the Air Traffic Procedures Advisory Committee (ATPAC) was called to order by Chair Lynette Jamison on Tuesday, February 23, 2016 at 1:00 p.m. The meeting was held at CGH Technologies, Inc., 600 Maryland Ave SW, Suite 800W, Washington DC.

1.2 Representatives from the Federal Aviation Administration (FAA), National Aeronautics and Space Administration Aviation Safety Reporting System (NASA ASRS), US Department of Defense (DOD), Airline Dispatchers Federation (ADF), National Business Aviation Association (NBAA), Aircraft Owners and Pilots Association (AOPA), Air Line Pilots Association (ALPA), Allied Pilots Association (APA), Southwest Airlines Pilots' Association (SWAPA), National Air Traffic Control Association (NATCA), and the public attended as follows:

Heather Hemdal, Executive Director	Chuck Enders, FAA
Lynette Jamison, Chair	Russell Gold, FAA
Leslie McCormick, Secretary	Kari Gonter, NASA ASRS
Jake Anderson, ALPA	Keith Henry, FAA
Lawrence Beck, FAA	Darnell Jones, FAA
Rene Blanco, APA	Robert Lamond, NBAA
Patrick Boyle, ADF	Robert Law, FAA
Andrew Burns, FAA	Andy Marosvari, NATCA
Alison Chavis, US Army/DOD	Bruce McGray, FAA
Gary Christiansen, FAA	Darrell Pennington, ALPA
John Collins, General Aviation Pilot	Philip Saenger, FAA
Linda Connell, NASA ASRS	Brad Sims, SWAPA
Randy DeAngelis, FAA	Frederick Soechting, US Air Force/DOD
Rune Duke, AOPA	Sydney Tutein, US Army/DOD

1.3 Heather Hemdal presented the Executive Director's Report, providing the following information:

a. Status of Areas of Concern (AOC):

- Number of open AOCs: 3
- Deferred AOCs from Previous Meetings to Meeting #152 – 3
  - 145-2 - IFR Services in Class G Airspace
  - 148-01- ADS-B NOTAMS and Problem reporting
  - 148-02 - Clearances below published altitudes on procedures and airways
- New AOCs accepted at Meeting #151: None
- Closed AOCs from Meeting #151: None

b. Proposed AOCs: 4

- FAA Order 7110.65 paragraph 2-1-16 Related Incidents – submitted by NASA ASRS (**Attachment A**)
- RNAV versus Heading Clearance Confusion Incidents – submitted by NASA ASRS (**Attachment B**)

- East/West-North/South Transition Related Incidents – submitted by NASA ASRS (**Attachment C**)
  - Rejected Takeoff (RTO) Cancel Takeoff Clearance Phraseology Incidents – submitted by NASA ASRS (**Attachment D**)
- c. Topics for discussion from Meeting #151:
- Procedural Changes Resulting from ATO Safety Top 5
  - Status of Runway Approach Hold Sign Test
  - Update from 7110.65 Rewrite Team
  - Time Based Flow Management (TBFM) Procedures
- d. Briefings on new topics
- NextGen Progress Report
  - Takeoff and Landing Performance Assessment (TALPA) Workgroup
  - Wildlife Surveillance Concept (WiSC)
- e. FAA Update: FAA Reauthorization and privatization discussions are underway.

1.4 Corrections to ATPAC #151 Minutes: The meeting had no changes to the ATPAC #151 Minutes.

1.5 Review of Agenda Items and Call for New Agenda Items. The following agenda was presented to the meeting. No new agenda items were proposed.

- a. Call to Order/Roll Call
- b. Recognition of Attendees
- c. Executive Director's Report
- d. Corrections to ATPAC #151 Minutes
- e. Review of Agenda Items and Call for New Agenda Items
- f. Review of Deferred Safety Items/Call for Safety Items
- g. Introduction of New AOCs or Miscellaneous Items
- h. Status Updates to Existing AOCs
- i. Briefings/Updates on Recurring Agenda Items
- j. Discussion on New Agenda Items
- k. Location and Dates for Future Meetings
- l. Adjourn

## **2 Review of Deferred Safety Items/Call for Safety Items - None**

## **3 Introduction of New AOCs or Miscellaneous Items**

3.1 Four proposed AOCs were submitted to the meeting:

*FAA Order 7110.65 paragraph 2-1-16 Related Incidents – submitted by NASA ASRS*

- a. NASA ASRS had received reports from pilots and controllers in reference to visual flight rules (VFR) aircraft being under radar surveillance, and the radar service was terminated in close proximity to some type of airspace for which the controller did not have jurisdiction. Pilots and controllers reported that the aircraft pilot did not have time to turn away from the airspace and were then violated for an airspace deviation.

- b. The meeting reviewed and discussed the guidance currently published for controllers, noting that it was the pilot's responsibility to be aware of the requirements for the airspace in which they were operating and to make appropriate radio contact.
- c. AOPA suggested a new paragraph to be added to the Airman's Information Manual (AIM), Section 4-1-18 *Terminal Radar Services for VFR*, which may clarify the pilot's responsibilities. However, following the discussion, the meeting did not accept the proposed AOC as submitted.

*RNAV versus Heading Clearance Confusion Incidents – submitted by NASA ASRS*

- a. NASA ASRS reported receiving pilot and controller reports regarding RNAV departure clearances issued by Clearance Delivery. Flight crews taxied for takeoff, then Tower issued a last minute departure change instructing crews to fly a heading instead of the RNAV departure. Confusion in the cockpit ensued as to how long the crew flies the heading and when to return or not return to the RNAV Departure.
- b. During the discussion, it was noted that this was a common problem due to the clearances being issued during a very busy time in the cockpit. Because the matter was already being addressed by the FAA, the meeting did not accept the proposed AOC.

*East/West-North/South Transition Related Incidents – submitted by NASA ASRS*

- a. NASA ASRS received multiple pilot and controller reports describing confusion regarding the names of Standard Terminal Arrival Routes (STARs) with East/West or North/South Transitions. Reporters described confusion about the runway in use in relationship to the transition they were flying. Reportedly, names on transitions are confusing if on different STARs. Controllers have expressed concerns with the time and distraction involved to correct flight crews experiencing this type of confusion.
- b. Two issues were raised during the meeting discussion of this proposed AOC. First, the meeting was informed that procedures were being changed to task the enroute controller to issue the runway to the pilot. The current guidance is that the controller issues the landing direction, not the runway. Second, it was suggested that different names should be assigned to each transition. This is not within the purview of ATPAC, and the Chair will refer this to the Aeronautical Charting Forum.
- c. The meeting did not accept the proposed AOC.

*Rejected Takeoff (RTO) Cancel Takeoff Clearance Phraseology Incidents – submitted by NASA ASRS*

- a. This issue was raised during the ATPAC #151 meeting. The following was included in the minutes of that meeting:
 

*3.3 Regarding the phraseology for cancellation of takeoff clearance, ATPAC #150 had noted that AOC 141-2, Subject: Cancellation of Takeoff Clearance "Phraseology" JO7110.65 para 3-9-10, had been opened. A summary of the subsequent meeting reports on this AOC during was presented, concluding with the closure of AOC 141-2 by ATPAC #143, when the action was passed to the Human Factors office. No report on the study conducted by Human Factors had been received, and Gary Norek agreed to follow up.*

- b. No information was available on the study conducted by Human Factors.
- c. The guidance in the International Civil Aviation Organization (ICAO) *Procedures for Air Navigation Services – Air Traffic Management* (PANS-ATM), paragraph 12.3.4.11 e) provides the phraseology to cancel a takeoff clearance as “HOLD POSITION, CANCEL TAKEOFF I SAY AGAIN CANCEL TAKEOFF (*reasons*)”. Paragraph 12.3.4.11 f) provides different phraseology to stop a take-off after an aircraft has commenced take-off roll: “STOP IMMEDIATELY [(*repeat aircraft call sign*) STOP IMMEDIATELY]”
- d. The United States publishes a difference to this phraseology in the Aeronautical Information Publication (AIP): “CANCEL TAKEOFF CLEARANCE (*reason*)”.
- e. Following the discussion, the meeting agreed that the suggested action as presented in the AOC was not within the purview of the ATPAC, and the AOC was not accepted as proposed.

#### 4 Status Updates to Existing AOCs

##### *AOC 145-2 Instrument Flight Rules (IFR) Services in Class G Airspace*

4.1 The Document Change Proposal (DCP) for the FAA Pilot/Controller Glossary with a new definition for Class G Airspace was submitted with the following wording:

*CLASS G AIRSPACE – Uncontrolled airspace or Class G airspace is the portion of the airspace that has not been designated as Class A, B, C, D, or E. It is therefore designated uncontrolled airspace. Class G airspace extends from the surface to the base of the overlying controlled airspace. IFR flight into Class G airspace is permitted upon pilot request, however ATC has no responsibility for the separation of IFR traffic in Class G airspace. Safety alerts must be provided. Traffic advisories are provided, workload permitting.*

4.2 The FAA Office of the Chief Counsel did not concur with the proposed change. Given this lack of concurrence, all available options have been exhausted. **CLOSED.**

##### *AOC 148-01 – Automatic Dependent Surveillance – Broadcast (ADS-B) Notices to Airmen (NOTAMS) and Problem Reporting*

4.3 Guidance for reporting and recording Automatic Dependent Surveillance – Broadcast (ADS-B) service malfunctions (AOC 148-01) was published on December 10, 2015 to include: Definition of Automatic Dependent Surveillance – Rebroadcast (ADS-R) was added to the Pilot/Controller Glossary (PCG); Guidance for Flight Service Station (FSS) recording of malfunctions was added to FAA Order 7110.10, paragraph 4-1-5 d; and Guidance for reporting ADS-B service malfunctions was added to the AIM (4-5-7 thru 4-5-10) and AIP (ENR 1.1.45.6 and ENR 1.1.46.5). **CLOSED.**

##### *AOC 148-02- Clearances below published altitudes on procedures and airways*

4.4 A DCP to FAA Order 7110.65, paragraph 4-8-1 to address the concerns about clearances issued below published altitudes was published in the December 10, 2015. The AIM update to provide guidance to pilots is complete and is scheduled for publication on May 26, 2016. **CLOSED.**

## 5 Briefings

### *FAA Air Traffic Procedures Update*

- 5.1 Larry Beck presented an update on FAA Air Traffic Procedures. (See **Attachment E**)
- a. Top 5: Activities in progress included:
    - Pilots operating at unexpected or unintended altitude, difficulty of pilots and controllers to separate for wake leading to loss of wake separation
    - Large or heavy aircraft wake turbulence encounter despite maintaining separation
    - Close-proximity helicopter operations in the vicinity of an airport
    - Air Traffic Control scanning technique did not provide situational awareness, and
    - Lack of radar-derived weather information displayed on controller scope.
  - b. Runway Approach Hold Sign Test: The final report was in the publication process. The Safety Risk Management Document (SRMD) has been signed in respect to the project and phraseology changes. The SRM Panel will be reconvened to present the results of the test and the SRMD. New signage and marking will be included in Advisory Circulars by the Office of Airport Safety and Standards.
  - c. Wake Turbulence Update: The status of the implementation and training for the Implementation of Wake Re-categorization Project (RECAT) 1.5 was presented.

### *Update from FAA 7110.65 Rewrite Team*

5.2 Larry Beck presented an update on the FAA ATC Handbook Revision Project. The following issues were being addressed under the project, as identified by the National Air Traffic Controllers Association (NATCA), Industry and FAA Management (Note: Items annotated with an asterisk were carried over from FY 2015). Status reported during the meeting is contained in **Attachment F**.

- a. NATCA
  - En Route Passing and Diverging\*
  - Pilot/Controller Glossary Class G Airspace\*
  - Minimum Enroute Altitudes
  - Weather – ATC Roles and Responsibilities
  - Line Up and Wait
- b. Industry
  - Descend Via Phraseology\*
  - Utilizing RNAV/RNP in lieu of Vectoring for Visual Approach – COMPLETED
  - Holding “As Published” Clearances
  - IFR Go-Around Traffic Remaining in the Traffic Pattern
  - ATC Service and Operational Priority
- c. FAA Management
  - “Proceed as Requested” Clearances
  - Parallel Runway Operations Phraseology
  - Uncontrolled Airport Releases
  - Incorporate Information on Enhanced Flight Vision Systems (EFVS)
  - Speed Assignments for Aircraft Operating Below Class B Airspace

### *Takeoff and Landing Performance Assessment (TALPA)*

5.3 Chuck Enders, TALPA Workgroup Co-Lead, assisted by Phil Davenport, Lynette Jamison, Trish Gay, and Robert Law presented the meeting with a briefing on TALPA. The concepts are to standardize:

- a. Methods for assessing runway conditions
- b. Reporting of braking action by pilots
- c. Reporting of runway conditions through airport operators, the NOTAM system, and ATC agencies
- d. Airplane performance data
- e. Before landing performance assessments
- f. Terms used in runway condition reports and performance data

5.4 The project redefined Braking Action and Braking Action Advisories, incorporating new sub-categories. A new definition of Runway Condition Code correlates surface contamination, braking action (when available), and three runway segments (touchdown, midpoint and rollout). The former Runway Condition Reading will be redefined as Runway Condition Report, which is an airport management report incorporating runway contamination, runway condition code, braking action reports, and qualitative assessment.

5.5 The implementation date will be October 1, 2016. Further details of the implementation are provided at **Attachment G**.

### *NextGen Progress Report*

5.6 John Maffei, Division Manager, FAA NAS Lifecycle Division, presented a high-level review of the NextGen priorities and initiatives, which include En Route Automation Modernization (ERAM), Automatic Dependent Surveillance – Broadcast (ADS-B), Data Communications in Support of NextGen (Data Comm), Terminal Automation Modernization/Replacement (TAMR), Terminal Flight Data Manager (TFDM), National Airspace System Voice System (NVS), and System Wide Information Management (SWIM).

### *Time Based Flow Management (TBFM) Update*

5.7 An update on TBFM was provided by Darnell Jones. (See **Attachment H**) The basic idea for TBFM is to predict the time that each flight will arrive at a given meter reference point, build a “schedule” which de-conflicts the flights based on constraints input into the system, and then calculate how much delay each flight will need to absorb to meet the scheduled times. Those delays are then projected back along the flight path – sometimes to the ground – based on input parameters. The result is a smooth delivery of the flow of traffic to the destination.

5.8 The targeted TBFM objectives are underway. The vision, unified direction, policies and procedures and training are complete. The culture and communication, system management and outcome analysis are still in progress.

### *Wildlife Surveillance Concept (WiSC)*

5.9 Anton Koros, FAA Advanced Concepts Branch, presented a concept overview of the WiSC (see **Attachment I**). This concept takes advantage of more than 15 years of avian research by government and

industry in support of airport operations, and provides recommendations on how to best present supplemental bird threat information to air traffic control tower operators.

5.10 Currently, there are limitation on the ability for air traffic controllers to detect avian threats, as well as the quality of bird threat information. The concept is taking into account information needs, display requirements, and procedural recommendations for dissemination bird threat information.

5.11 The benefits of the WiSC concept include improved threat detection, improved information quality, and improved procedures.

## **6 Discussion on New Agenda Items**

6.1 No new agenda items were raised.

## **7 Location and Dates for Future Meetings**

7.1 It was tentatively agreed that the **ATPAC #153** meeting would be held at the FAA Air Traffic Control System Command Center (ATCSCC), located at 3701 Macintosh Dr., Warrenton VA 20187 on Monday afternoon and all day Tuesday, July 11-12, 2016. Additional information will be sent out as soon as it is available.

## **8 Adjournment**

8.1 There being no further business, the meeting was adjourned on Wednesday, February 24 at 11:50am.



## AIR TRAFFIC PROCEDURES ADVISORY COMMITTEE

### AREA OF CONCERN & AGENDA ITEM Submission Form

(Check one)

Area of Concern → Safety Item?  Yes  No

Agenda Item

For Admin Use Only

AOC Number: AOC-

Date: \_\_\_\_\_

Recommendation

Number: R-\_\_\_\_\_

**SUBJECT:** FAA Order 7110.65 Paragraph 2-1-16 Related Incidents

**DISCUSSION:** During open session at ATPAC 151 Kari Gonter, NASA (ASRS) ATC Expert Analyst, brought up the issue of reports from pilots and controllers in reference to VFR aircraft being under radar surveillance that are terminated in close proximity to some type of airspace the controller does not have jurisdiction of. Pilots report being terminated and switched over to Tower on the assumption that the controller has received permission from the Tower to continue the flight to the airport, or to be able to navigate through the Tower's airspace. The controller reports describe these handoffs also. This type of termination also happens with aircraft in close proximity to Class Bravo airspace where the pilot is told to remain clear of the airspace. Pilots and controllers report that the aircraft pilot does not have time to turn away from the airspace and then is violated for an airspace deviation. Controllers seem to be unaware of or are not considering the close proximity and structure of different airspace; as well as, speed and altitude of the aircraft involved.

**SUGGESTED ATPAC ACTION:** Determine the airspace structural issues that may be leading or contributing to these events and whether better guidance or procedures be provided to both pilots and controllers.

Sponsor: L. Connell/K. Gonter

Name (Print)

NASA ASRS

Organization

1/29/2016

Date



## AIR TRAFFIC PROCEDURES ADVISORY COMMITTEE

### AREA OF CONCERN & AGENDA ITEM Submission Form

(Check one)

Area of Concern → Safety Item?  Yes  No

Agenda Item

For Admin Use Only

AOC Number: AOC-xxx-xx

ATPAC #xxx

Recommendation

Number: R-          

**SUBJECT:** RNAV versus Heading Clearance Confusion Incidents

**DISCUSSION:** ASRS has received pilot and controller reports regarding RNAV departure clearances issued by Clearance Delivery. Flight crews taxi for takeoff, then Tower issues a last minute departure change instructing crews to fly a heading instead of the RNAV departure. Confusion in the cockpit ensues as to how long the crew flies the heading and when to return or not return to the RNAV Departure. Departure Controller then asks crew why they are not flying the RNAV departure. These types of issues involve both RNAV vs Heading, and Heading vs RNAV.

**SUGGESTED ATPAC ACTION:** Develop and provide guidance or phraseology to clarify RNAV departure clearances to both pilots and controllers.

Sponsor: L. Connell/K. Gonter

Name (Print)

NASA ASRS

Organization

1/29/2016

Date





## AIR TRAFFIC PROCEDURES ADVISORY COMMITTEE

### AREA OF CONCERN & AGENDA ITEM Submission Form

(Check one)

Area of Concern → Safety Item?  Yes  No

Agenda Item

For Admin Use Only

AOC Number: AOC-xxx-xx

ATPAC #xxx

Recommendation

Number: R-          

**SUBJECT:** East/West-North/South Transition Related Incidents

**DISCUSSION:** ASRS has received multiple pilot and controller reports describing confusion regarding the names of STARS and East/West or North/South Transitions. Reporters have also described confusion about the runway in use in relationship to the transition they are flying. Reportedly, names on transitions are confusing if on different STARS. Controllers have expressed concerns with the unwanted time it takes to correct flight crews when they experience this type of confusion. Distraction is also cited.

**SUGGESTED ATPAC ACTION:** Review names on STARS/Transitions to alleviate any confusing names before publishing.

Sponsor: L. Connell/K. Gonter

Name (Print)

NASA ASRS

Organization

1/29/2016

Date





## AIR TRAFFIC PROCEDURES ADVISORY COMMITTEE

### AREA OF CONCERN & AGENDA ITEM Submission Form

(Check one)

Area of Concern → Safety Item?  Yes  No

Agenda Item

For Admin Use Only

AOC Number: AOC-

Date: \_\_\_\_\_

Recommendation

Number: R-\_\_\_\_\_

**SUBJECT:** RTO Cancel Takeoff Clearance Phraseology Incidents

**DISCUSSION:** From the ATPAC/151 Minutes:

3.3 Regarding the phraseology for cancellation of takeoff clearance, ATPAC #150 had noted that AOC 141-2, Subject: Cancellation of Takeoff Clearance “Phraseology” ... JO7110.65 para 3-9-10, had been opened. A summary of the subsequent meeting reports on this AOC during was presented, concluding with the closure of AOC 141-2 by ATPAC #143, when the action was passed to the Human Factors office. No report on the study conducted by Human Factors had been received, and Gary Norek agreed to follow up.

Additional information from ASRS is available to discuss in the next meeting.

**SUGGESTED ATPAC ACTION:** Open new AOC due to no Human Factors response.

Sponsor: L. Connell/K. Gonter

Name (Print)

NASA ASRS

Organization

1/29/2016

Date

*Briefing to ATPAC*

# Air Traffic Procedures Update

*Presented by:*

Larry Beck ♦ Manager, Terminal Air Traffic Procedures Group

*On behalf of*

Heather Hemdal, ♦ Director, Air Traffic Procedures, AJV-8

*February 2016*

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# AGENDA

ATO Top 5

Status of Runway Approach Hold Sign Test

Class G Airspace

Wake Turbulence Update

Discussion



# Top 5 – Altitude Compliance

- **Carry over from 2012.**
- **Repaneled because the data from AT SAP, CISP and ASAP shows that the problem is still prevalent.**
- **SRMP conducted January 2016**
- **SRMD in draft**

Pilots operating at  
unexpected or  
unintended altitude

# Top 5 – Wake Separation

- **The CAP contained actions to reduce the number of losses of wake separation:**
- **January 2016 Recurrent training that includes Wake Turbulence as a topic**
- **Develop a Flyer/Poster on issuing cautionary wake turbulence advisories**
- **Update Wake Turbulence Training**
- **Develop short videos that cover specific wake turbulence issues and TARP detection algorithms**
- **Develop requirements for a tool to assist controllers in applying wake turbulence separation standards**
- **Clarify definition of: “Operating Directly Behind” contained in FAAO 7110.65, Paragraph 5-5-4**



Difficulty of pilots and controllers to separate for wake leading to loss of wake separation.

# Top 5 – Large or Heavy Aircraft Wake Turbulence

- **Large or heavy aircraft wake turbulence encounter despite maintaining separation**
- **SRMP conducted December 2015**
- **CAP updated**
- **Group from ADS-B office discussing feasibility of using ADS-B to provide aircraft type information to both ground and cockpit**



Large or heavy aircraft  
wake turbulence  
encounter despite  
maintaining separation

# Top 5 – Helicopter Operations

Close-proximity  
helicopter operations  
in the vicinity of an  
airport

- **USHST course content approved**
- **Recurrent Training team integrating information**
- **Task lead (SWA) drafting white paper**



# Top 5 – Tower Visual Scanning

Air Traffic Control scanning technique did not provide situational awareness

- **SRMP conducted February, 2016 to identify potential elements**
- **Human Factors is developing white paper**



# Top 5 – Weather Access

Lack of radar-derived weather information displayed on controller scope

- **Tech Ops completed RADAR coverage gap analysis**
- **Tech Ops completed weather product inventory review**
- **Tech Ops evaluating best method to provide weather display over facility airspace map at P50**





# Class G Airspace

- Background
  - 7110.65 Steering Committee proposed change
- AGC Response
  - Non Concurrence
- Status
  - Given this lack of concurrence, the Steering Committee believes it has exhausted all available options and any further would be outside its purview



# Wake Turbulence Update

## Implementation of Wake Re-categorization Project (RECAT) 1.5

- Implementation completed for D01 and DIA; IOC met on 12/10/2015.
- IND (combined Tower & TRACON): Training 2/29/2016 thru 3/11/2016. IOC date of 3/22/16.
- Northern California TRACON (NCT): Training 5/02/2016 thru 5/26/2016
- SJC & RNO: Training 4/11/2016 thru 4/15/2016
- SFO & OAK: Training 4/18/2016 thru 4/29/2016
  - IOC for NCT, SJC, RNO, SFO and OAK will be 5/26/2016
- Anchorage TRACON (A11) & ANC: initial Wake RECAT briefing will be 3/30/2016. ANC is a collocated split facility with *no other associated towers* going RECAT. IOC for A11 and ANC 2<sup>nd</sup> quarter of CY2016.
- Southern California TRACON (SCT), LAX, SAN, SNA, ONT & BUR scheduled for 3<sup>rd</sup> quarter of CY 2016.
- Honolulu International Airport (HNL) scheduled for 4<sup>th</sup> quarter of CY 2016.





*Thank you*



*Update to ATPAC*

# FAA Air Traffic Standards and Procedures

*ALIGNING 7110.65 WITH NEXTGEN AND PBN*

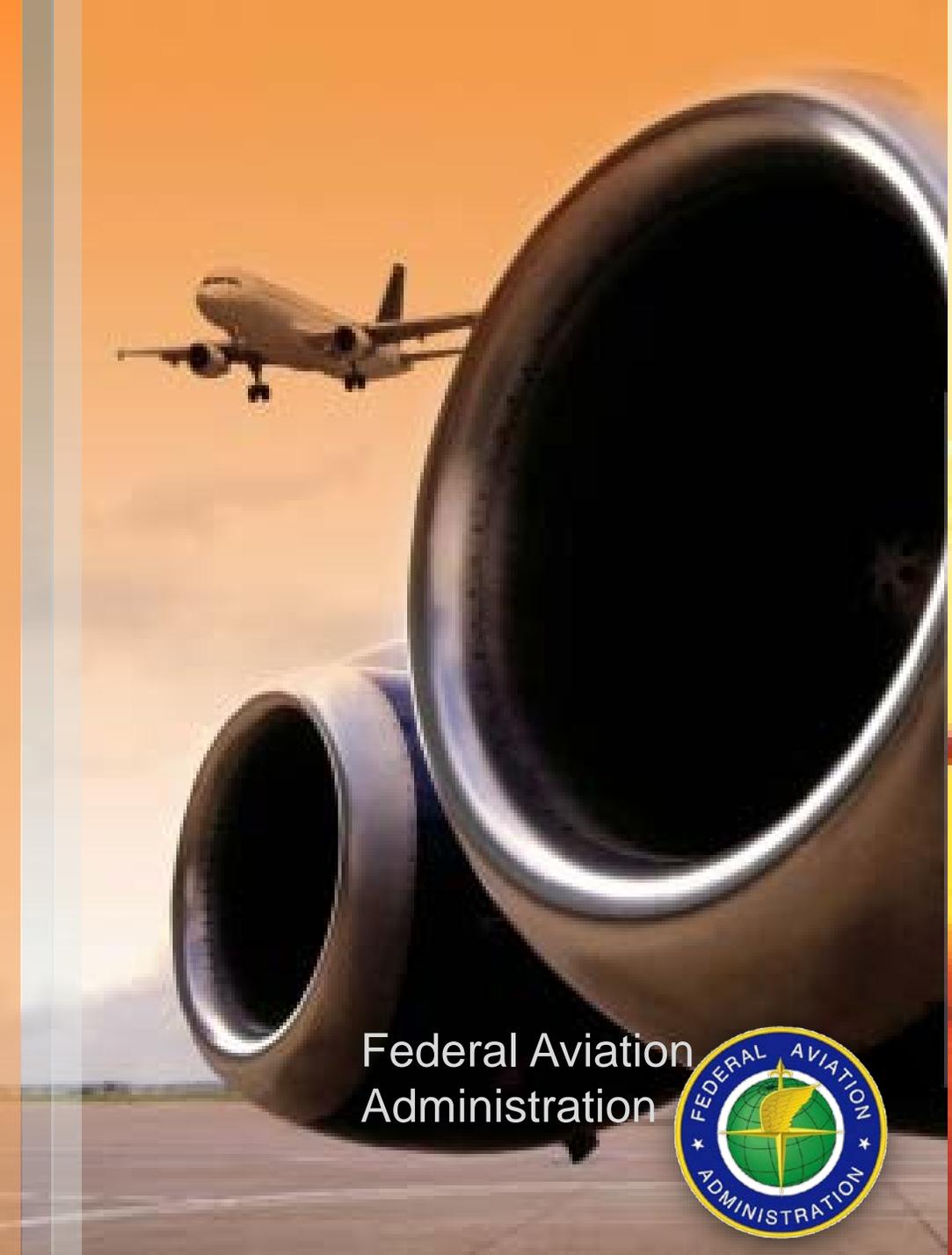
## ATC Handbook Revision Project

*Presented by:*

Larry Beck ♦ Terminal Group Manager, Mission Support Services,  
AJV-82

*February 2016*

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# The ATC Handbook Revision Project FY15: Final



NATCA	INDUSTRY	MANAGEMENT
En Route Passing and Diverging Application – Carryover to FY16	Descend Via Phraseology – Carryover to FY16	Triple Independent Approaches – No High Update RADAR - Completed
Expanding the Definition of RADAR - Completed	RNAV/RNP for Adjacent Airports - Completed	Reduction of Diagonal Separation for Parallel Dependent Approaches - Completed
Pilot / Controller Glossary Class G Airspace – Carryover to FY16	Utilizing RNAV/RNP in lieu of Vectoring for Visual Approach – Carryover to FY 16	Treat Go-around and Missed Approach Operations as a Normal Departure - Completed
Transitional Separation - Completed	PBN Capabilities Displayed to Controllers - Completed	Integrate ADS – B Procedural Guidance - Completed
Tower Applied and Pilot Applied Visual Separation - Completed  <b>TOP 5 ITEM</b>	Shortcutting RNAV Aircraft - Completed	Reorganize Approach Clearance Differentiations, Paragraph - Completed

# The ATC Handbook Revision Project: FY16

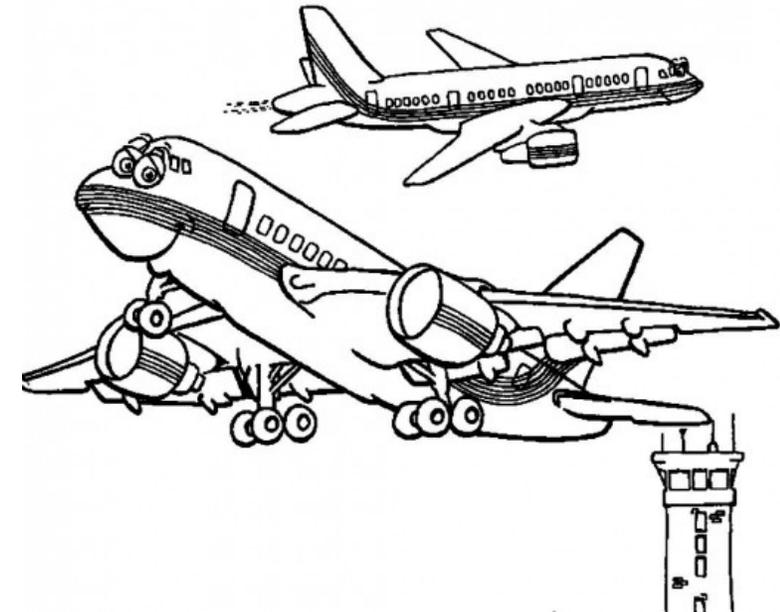


NATCA	INDUSTRY	MANAGEMENT
<p>En Route Passing and Diverging Application</p> <p>SRMD</p>	<p>Descend Via Phraseology</p> <p>SRMD</p>	<p>“Proceed as Requested” Clearances</p> <p>DCP Drafted</p>
<p>Pilot / Controller Glossary Class G Airspace</p> <p>Finalizing</p>	<p>Utilizing RNAV/RNP in lieu of Vectoring for Visual Approach</p> <p>Completed</p>	<p>Parallel Runway Operations Phraseology</p> <p>DCP Drafted</p>
<p>Minimum EnRoute Altitudes</p> <p>In Process</p>	<p>Holding “As Published” Clearances</p> <p>DCP Drafted</p>	<p>Uncontrolled Airport Releases</p> <p>Out for Comment</p>
<p>Weather – ATC Roles and Responsibilities</p> <p>In Process</p>	<p>IFR Go-Around Traffic Remaining in the Tower Pattern</p> <p>In Process</p>	<p>Incorporate Information on Enhance Flight Visibility Systems (EFVS)</p> <p>DCP Drafted</p>
<p>Line up and Wait</p> <p>DCP Drafted</p>	<p>ATC Service and Operational Priority</p> <p>In Process</p>	<p>Speed Assignments for Aircraft Operating Below Class B Airspace</p> <p>DCP Drafted</p>



## En Route Passing and Diverging Application

- Expanding to En Route Environment
- 45 degrees





## Pilot/Controller Glossary – Class G Airspace

- Current
  - CLASS G AIRSPACE – That airspace not designated as Class A, B, C, D or E
- New
  - CLASS G AIRSPACE – Uncontrolled airspace or Class G airspace is the portion of the airspace that has not been designated as Class A, B, C, D, or E. It is therefore designated uncontrolled airspace. Class G airspace extends from the surface to the base of the overlying controlled airspace. IFR flight into Class G airspace is permitted upon pilot request, however ATC has no responsibility for the separation of IFR traffic in Class G airspace. Safety alerts must be provided. Traffic advisories are provided, workload permitting.





## Minimum EnRoute Altitudes (MEAs)

- MEAs are based in part on ground-based navigational aid reception.
- The advent of satellite technology provides the opportunity to lower minimum altitudes along certain airways, resulting in more altitudes to be available for use.

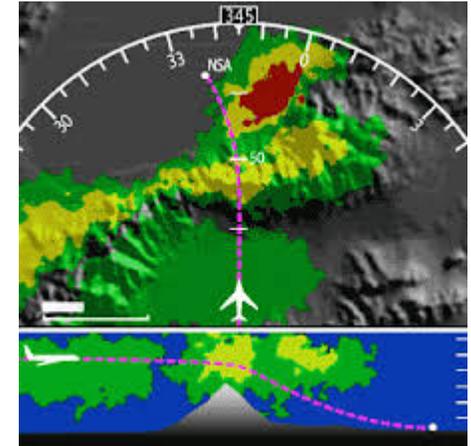




## Weather: ATC Roles And Responsibilities

This change will highlight ATC roles and responsibilities as they pertain to:

- Solicitation of Pilot Weather Reports (PIREPs)
- Issuance of areas of weather along routes of flight
- Timely dissemination of weather information





## Line up and Wait

This change will emulate USAF/USN requirements already published in the Order:

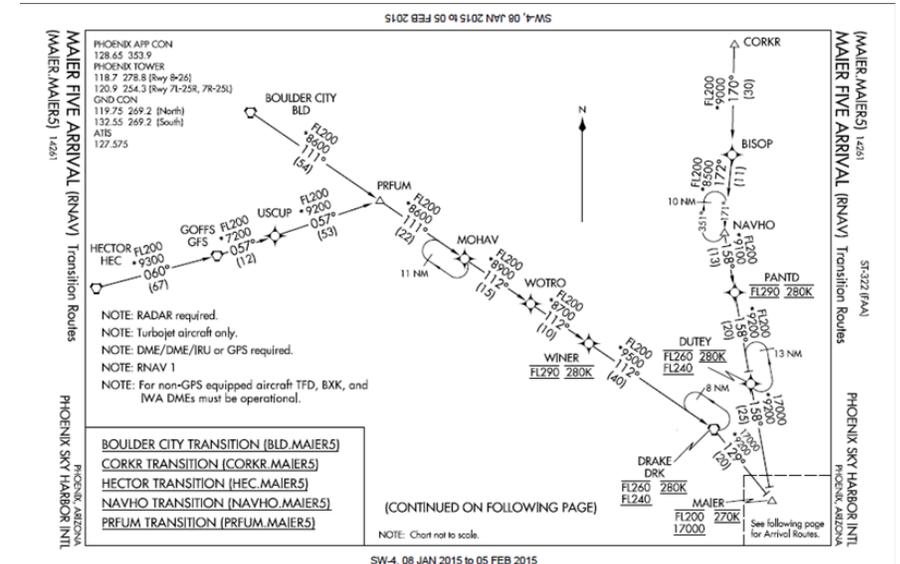
- When an aircraft is authorized to line up and wait, inform it of the closest traffic within a specified distance on final approach to the same runway.
- If the approaching aircraft is on a different frequency, inform it of the aircraft taxiing into position.





## Descend Via Phraseology

- Researching ARTCCs issuing runway transition assignment with a descend via clearance

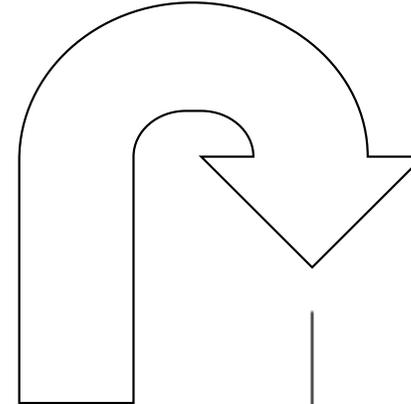




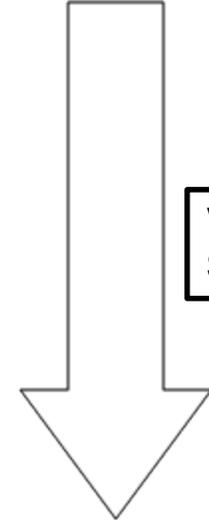
## Utilizing RNAV/RNP in lieu of Vectoring for Visual Approach

- Completed October 2015

RNAV/RNP Radius-to-Fix Turn



Visual Straight In





## Holding “As Published” Clearances

- This change will add language to clarify that the charted holding pattern needs to be published on the route or procedure being flown.





## IFR Go-Around Traffic Remaining in the Tower Pattern

- The current 7110.65 does not clearly address the handling of IFR go-around traffic that enter the tower pattern.
- This change will provide guidance to controllers on how to handle these situations.





## ATC Service and Operational Priority

- This change will address applicable paragraphs in the FAA Order 7110.65 in order to clarify requirements for ATC service and operational priority.





## “Proceed As Requested” Clearances

- Specific instructions must ensure positive control to ground vehicles as is provided to aircraft.
- The existing “proceed as requested” phraseology does not provide sufficient instructions for runway/taxiway access. This change will provide phraseology examples.





## Parallel Runway Operations Phraseology

- This change will incorporate phraseology to allow the use of the term “parallel runway” when issuing traffic during parallel runway operations.





## Uncontrolled Airport Releases

- The phraseology for issuing a release in conjunction with a VOID time is cumbersome and involves too many digits, leading to possible confusion.
- This change will permit controllers to use the number of minutes in group form versus single digit numbers.





## Incorporate Information on EFVS

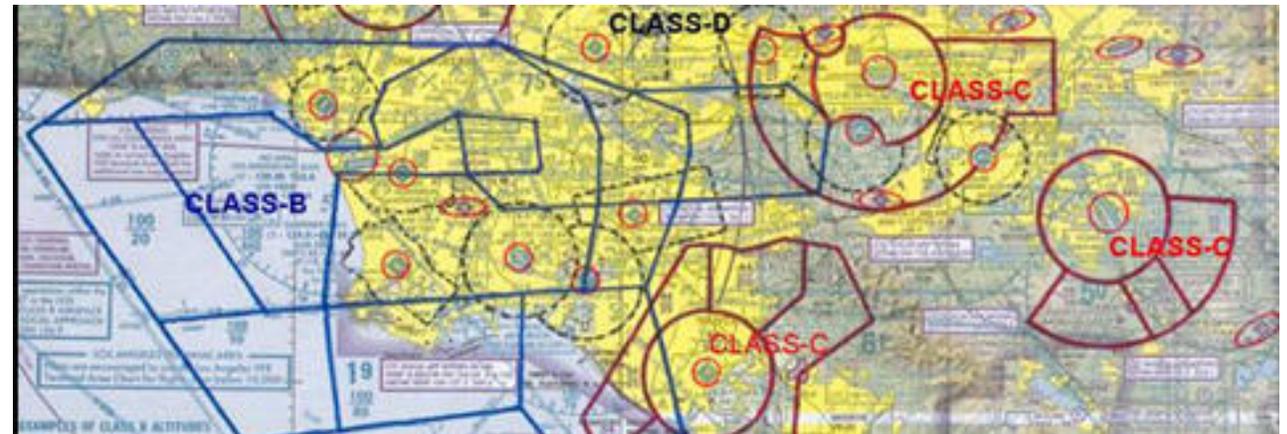
- The change will define Enhanced Flight Visibility Systems (EFVS) enhancing ATC awareness.





## ATC Speed Assignments for Aircraft Operating Below Class B Airspace

- This change will add language to emphasize the 200 knot speed limitation (IAW 14 CFR Part 91.117) for aircraft operating below Class B.





# Opening America's skies . . .



. . . to continued Efficiency and Safety.





*Thank you*



# Takeoff and Landing Performance Assessment (TALPA)

## Status Briefing – Air Traffic Procedures Advisory Committee

Presented to: ATPAC  
By: TALPA Workgroup SMEs  
Date: February 23, 2016



Federal Aviation  
Administration



# Introduction

- **Chuck Enders**
  - TALPA Workgroup Co-Lead
  - AFS-220, Part 121 Air Carrier Operations



# TALPA History

- **The Beginning**
- **Background**
- **Concepts**
- **Recommendations**
- **Actions already in effect**
- **Implementation steps by LOBs**
- **RCAM integration**
- **Future Requirements**



# TALPA Beginning

- **Excursion at Midway Dec 2005**
- **What is TALPA**
  - Landing distance assessment at time of arrival
  - Accounting for contaminated runways at the time of takeoff
  - Requirement needed to support those goals
- **FAA formed Aviation Rulemaking Committee**
  - Airplane Manufacturers
  - Regulatory Authorities
  - Other Organizations
  - Airplane Operators
  - Airport Operators
- **Recommendations provided to FAA in 2009**



# Background

- **TALPA ARC First Meeting – March 2008**
- **Separate workgroups established to address:**
  - Airports
  - Part 121 Aircraft Operations
  - Part 91-K/125/135 Aircraft Operations
  - Part 23/25 Aircraft Type Certification
- **Final recommendations provided on July 2009**
- **ARC Charter expired October 2009**
- **Rulemaking project suspended Sept. 2010**
  - Numerous rulemaking projects mandated by Congress
  - Projected rulemaking back-log out to 8+ years



# Background

## TALPA ARC Participants

### Regulatory Authorities

- FAA (Airports, Flight Standards, Certification, NOTAMS, Rulemaking, Legal)
- Transport Canada
- Brazilian Certification Authority
- EASA (Limited Participation)



### Other Organizations

- Air Transport Association
- Airline Pilots Association
- Airports Council International
- Allied Pilots Association
- National Air Carrier Association
- National Business Aviation Association
- National Transportation Safety Board
- Neubert Aero Corporation
- Regional Airline Association
- Southwest Airlines Pilot Association
- Allied Pilots Association



### Airplane Operators

#### Part 121

- ABX Air
- Alaska
- American Eagle
- American
- Continental
- Delta
- Express Jet
- Federal Express
- Northwest
- Pinnacle
- Southwest
- United
- UPS
- US Airways



### Airplane Operators

#### Part 91-K/125/135

- Alpha Flying, Inc
- Bombardier Flexjet
- Chantilly Air
- Flight Works
- Jet Solutions
- Conoco Phillips Alaska
- Net Jets
- Pogo Jet, Inc



### Airports

- Cherry Capital
- Chicago Airport System
- Chicago O'Hare
- Grand Rapids Regional
- Minneapolis/St. Paul Airport System



### Airplane Manufacturers

- Airbus
- Boeing
- Bombardier
- Cessna
- Eclipse
- Embraer
- Gulfstream
- Hawker



# TALPA Concepts are to Standardize

- Methods for assessing runway conditions
- Reporting of braking action by pilots
- Reporting of runway conditions through airport operators, the NOTAM system, and ATC agencies
- Airplane performance data
- Before landing performance assessments
- Terms used in runway condition reports and performance data



# TALPA Status as of 2/23/16

- **TALPA Elements Available**
- **TALPA Full Implementation Date:**
  - **October 1, 2016**



# AFS Implementation Actions 2016

- **Documents Update and Publishing Dates**
  - AC 91-79A - Mitigating the risks of a runway overrun on landing, 9/17/2014  
“B” version in development to accommodate new BRAP Terms, RCAM
  - Notice(s) to ASIs on Air Carrier Operations and Training.
  - **Develop Training and Training Guidance**
    - For Aviation Safety Inspector cadre – August, 2016
    - For Aircrew Testing Standard- August, 2016

## Collaboration Needed with: ATO, NOTAM Office

- Coordinate guidance on new NOTAM format utilization

- **\*\*\*Field/Industry Outreach \*\*\***

- Presentation to the annual SWIFT Conference 9/19/2016
- Presentation to the International SNOW Symposium 4/23/2016
- Presentation to A4A in coordination.
- Presentation to NTSB in coordination.
- Suggestions/requests from you on how FAA Public Affairs should proceed



# Transport Standards Implementation Actions

- **Published new Advisory Circulars**
  - AC-25-31: Takeoff Performance Data for Operations on Contaminated Runways – December 22, 2015
  - AC-25-32: Landing Performance Data for Time-of-Arrival Landing Performance Assessments – December 22, 2015
- **Industry Outreach**
  - Supporting EASA Rulemaking Task incorporating TALPA into EASA operating regulation possibly including recommendations of EASA CS-25 modifications
  - Supporting ICAO Friction Task Force including Airplane Performance sub-team which is incorporating TALPA into ICAO Standards and Recommendations (Annex 3, 6, 8,14,15)



# Airports (ARP) - FAA

- **Manager, Airport Safety and Operations**
  - AAS-300



# ARP Implementation Actions

- **Publish/update Advisory Circulars**
  - Winter Ops AC to include new TALPA & RCAM language
  - NOTAMs AC with contaminant reporting instructions
- **Develop Training**
  - For Airports' inspector cadre
  - For airport operators and other stakeholders
- **Collaborate with ATO NOTAM Office**
  - On system software changes to produce Rwy Condition Codes (RwyCC)
  - On a Beta test site for contaminant data input and output confirmation
- **Industry Outreach**
  - Partner with Airports' alphabet groups for TALPA implementation
  - Update international stakeholders at available conferences and forums



# NOTAMS and TALPA

- **Lynette Jamison**
  - US NOTAM Policy and Operations



# Notice to Airmen (NOTAM) TALPA Updates: Policy

- **FAAO 7930.2, *NOTAMs*, being updated to encompass TALPA initiatives**
  - SRMDM written by January 29, 2016.
  - Have ATO Publications (AJV-8) send this out for comment by February 26, 2016.
    - 45 days to review. Adjudicate comments by April 29, 2016.
  - Final document for publication by May 27, 2016.
  - Effective October 1, 2016 (TALPA Effective Date).



# Federal NOTAM System (FNS) and TALPA

- **Trish Gay**
  - Project Manager, Federal NOTAM System, AJM-336





# Federal NOTAM System (FNS) TALPA Updates: Schedule



TALPA requirements and scenario documentation updates

- Completed and approved December 2015



Development

- In progress, prototype/demo application will be completed by March 31, 2016



User acceptance testing (UAT)

- UAT planned to start by March 31, 2016 upon completion of the prototype



Release to production

- Scheduled for October 1, 2016 (to coincide with policy)



# ATC and TALPA

- **Larry Beck**
  - Manager, Terminal Standards and Procedures  
Terminal Standards and Procedures, AJV-82



# ATC Orders and TALPA

- **Documents Update and Publishing Dates**

- FAA Order JO 7110.65 – Air Traffic Control
- FAA Order JO 7210.3 – Facility Operation and Administration
- FAA Order JO 7110.10 – Flight Services
- Aeronautical Information Manual (AIM)
- Aeronautical Information Publication (AIP) ICAO
- Pilot/Controller Glossary
- **Information ready for use by August 2016 (through FAA notice)**
- **Publishing Dates – November 10, 2016**

- **Develop Training and Training Guidance**

- AJV-82 (Terminal Standards and Procedures) and AJT-2 (Air Traffic Services) will collaborate with Technical Training to ensure current training is updated or new training is created



# ATC Orders and TALPA

- **Collaboration Needed with:**

- All FAA Order changes are distributed to field facilities for a 45-day comment period. As part of the approved document change process, NATCA must be contacted prior to publication.

- **Field / Industry Outreach**

- TALPA is scheduled for a briefing to the Air Traffic Procedures Advisory Committee (ATPAC) on Wednesday February 24, 2016.



# TALPA Stakeholders

## Regulatory Authorities

- FAA (Airports, Flight Standards, Certification, NOTAMS, Rulemaking, Legal)
- Transport Canada
- Brazilian Certification Authority
- EASA (Limited Participation)



## Other Organizations

- Air Transport Association
- Airline Pilots Association
- Airports Council International
- Allied Pilots Association
- National Air Carrier Association
- National Business Aviation Association
- National Transportation Safety Board
- Neubert Aero Corporation
- Regional Airline Association
- Southwest Airlines Pilot Association
- Allied Pilots Association



## Airplane Operators

### Part 121

- ABX Air
- Alaska
- American Eagle
- American
- Continental
- Delta
- Express Jet
- Federal Express
- Northwest
- Pinnacle
- Southwest
- United
- UPS
- US Airways



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- Airbus
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- Bombardier
- Cessna
- Eclipse
- Embraer
- Gulfstream
- Hawker



# Runway Conditions



# Runway Conditions and PIREPS

## Airport Operations



Runway Conditions

Braking Action PIREPS

Air Traffic Control Tower

Braking Action PIREPS



## Arriving Aircraft



Runway Conditions



# Required Training

- **Brief Procedural Changes to All Controllers**
  - Terminal
    - FAA Facilities
    - DoD Facilities
    - Federal Contract Towers
  - EnRoute
  - Flight Service



# Air Traffic Control Procedural Changes

- Order JO 7110.65 – Air Traffic Control
- Order JO 7210.3 – Facility Operation/Administration
- **What Changes with TALPA?**
  - Removes all reference to “Mu” and “friction reports”; replaces with Runway Condition Codes – “0” (worst) to “6” (best) **(current reportable values are 40 or less)**
  - Removes “Fair” as reportable braking action report; replaces with ICAO version “Medium”
    - **New sub-categories: “Good to Medium” and “Medium to Poor”**
  - Added guidance concerning Braking Action Advisories on ATIS broadcasts; when to terminate Braking Action PIREPS



# Flight Services Procedural Changes

- Order JO 7110.10 – Flight Services
- **What Changed with TALPA?**
  - Removes all reference to “Mu” and “friction reports”; replaces with Runway Condition Code – “0” to “6”  
**(current reportable values are 40 or less)**
  - Removes “Fair” as reportable braking action condition; replaces with ICAO “Medium” **(2 new sub-categories)**
  - Provides an EXAMPLE of Runway Condition Code terminology **(current version did not have example)**
  - Grammatical change in acronym; “ALFA” to “ALPHA”



# Aviation/Airspace Users Procedural Changes

- **Aeronautical Information Manual (AIM)**
- **Aeronautical Information Publication (AIP)**
- **What Changed with TALPA?**
  - Removed “Mu” and “friction reports” removed
  - Braking Action “Fair” replaced with “Medium”
  - Field Condition (FICON) NOTAM terminology
  - Replaced definition of “friction” with new definition of Runway Braking coefficient
  - Described what the Runway Condition Assessment Matrix (RCAM) is and what it accomplishes



# ATC / Aviation Procedural Changes

- **Pilot/Controller Glossary**
  - **What Changed With TALPA?**
    - **Re-defined Braking Action and Braking Action Advisories**
      - Incorporated new sub-categories
    - **New definition of Runway Condition Code**
      - Correlates surface contamination, braking action (when available), and 3 runway segments (touchdown, midpoint, and rollout)
    - **Re-defined Runway Condition Report**
      - Formerly known as **Runway Condition Reading**
      - An airport management report incorporating runway contamination, runway condition code, braking action reports, and qualitative assessment.



# What didn't change with TALPA

- **Controllers will still solicit braking action reports from pilots after/upon landing.**
- **Controllers will still issue runway conditions via the ATIS broadcast**
- **Notification to/from Airport Ops, and to/from pilots, concerning landing conditions (PIREPS/NOTAMS)**
- **Inclusion of information via ATIS broadcasts**



# Summary – Chuck Enders

- **All TALPA Actions Planned Effective Date: October 1, 2016**
- **TALPA POCs:**
  - Chuck Enders: [charles.j.enders@faa.gov](mailto:charles.j.enders@faa.gov)
  - Phil Davenport: [phillip.davenport@faa.gov](mailto:phillip.davenport@faa.gov)



# QUESTIONS ?



Federal Aviation  
Administration



# Air Traffic Procedures ATPAC TBFM Update

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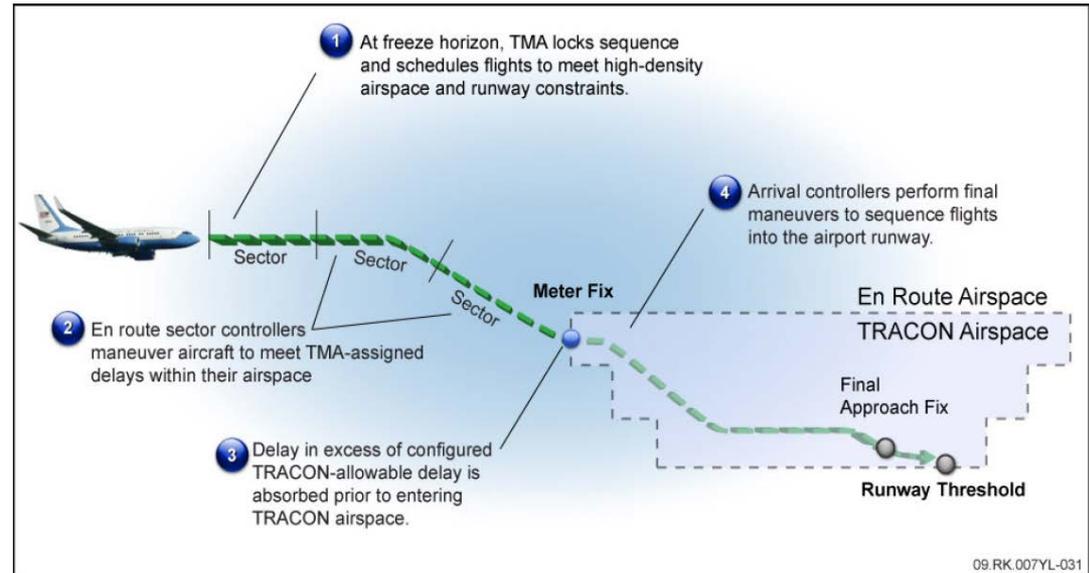
**TBFM**  
*Time Based  
Flow Management*

Presented By: Air Traffic Procedures

Presented To: ATPAC

# Time Based Flow Management (TBFM)

- ✓ Automation designed to manage the flow of aircraft as they approach and depart congested airspace and airports
- ✓ **Time Based Metering (TBM) more efficiently manages congested airspace versus Miles-in-Trail by:**
  - ✓ **Smoothing out irregularities in traffic flows**
  - ✓ **Eliminating the bunching of aircraft**
  - ✓ **Delivering a more efficient, consistent flow of traffic into the TRACON**

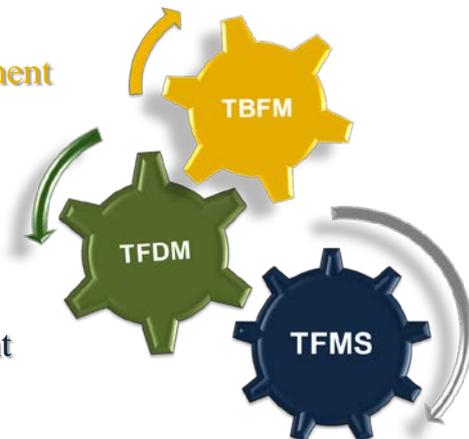


TBFM is part of a broad set of Traffic Management tools

Time-Based Flow Management (TBFM)

Terminal Flight Data Management (TFDM)

Traffic Flow Management System (TFMS)



# Key TBFM Inputs

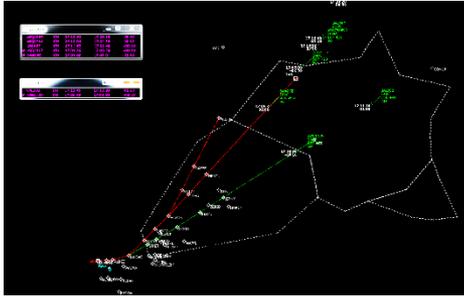
## **Adaptation: Multi-facility considerations**

- ✓ Identify locations of meter fixes and meter arcs
- ✓ Define nominal routes in the TRACON
- ✓ Runway assignment decision tree
- ✓ Aircraft performance
- ✓ Frequently used airport configurations
  
- **Real-time ETA Calculation (every 6 seconds)**
  - Flight plan data
    - Filed route
    - Aircraft type
  - Radar track data
    - Current Position and speed
  - Wind speed and direction (RUC data)
    - Updated hourly (\*improved wind processing expected in July)

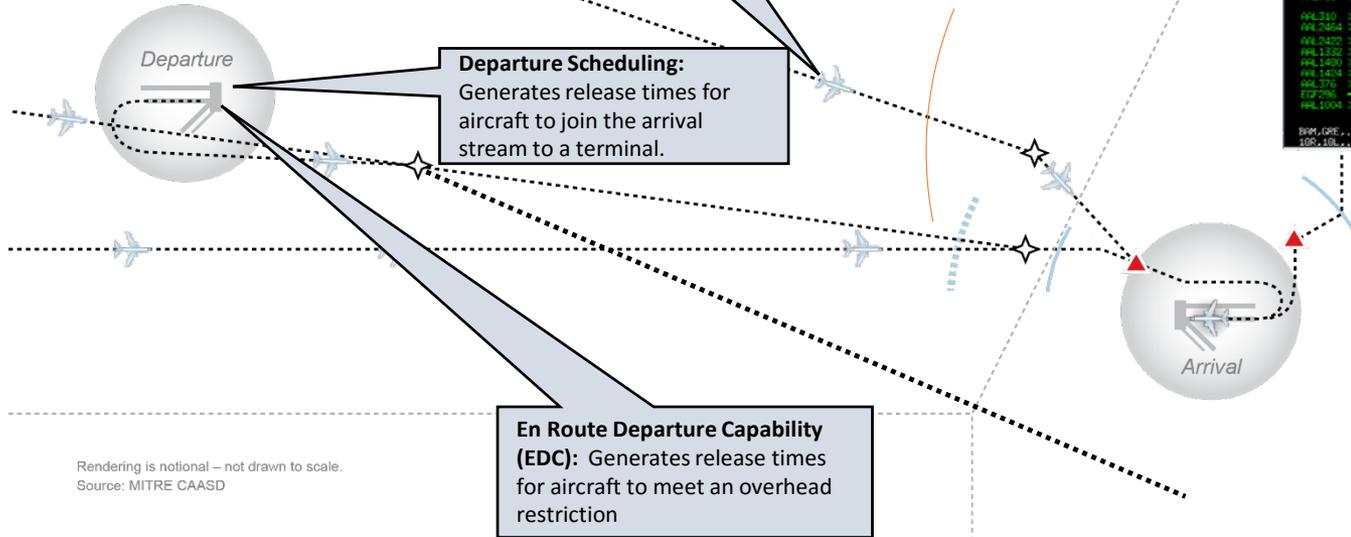
## **TBFM Settings: Dynamic system management**

- ✓ Current airport configuration
- ✓ Desired separation at the runway
- ✓ Desired minimum separation at the meter fix
- ✓ Airspace maximum delay time (AMDT)
- ✓ TRACON Buffer (how much delay can be absorbed in TRACON)

# Current TBFM Capabilities



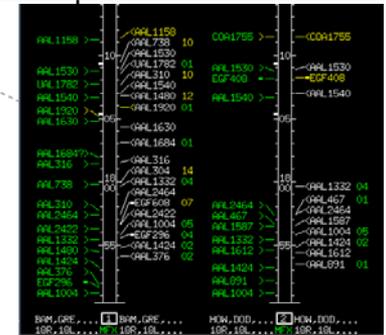
**Airborne Metering (Times on Glass):** Provides aircraft specific delay times to provide smooth flow into a terminal.



**Departure Scheduling:** Generates release times for aircraft to join the arrival stream to a terminal.

**En Route Departure Capability (EDC):** Generates release times for aircraft to meet an overhead restriction

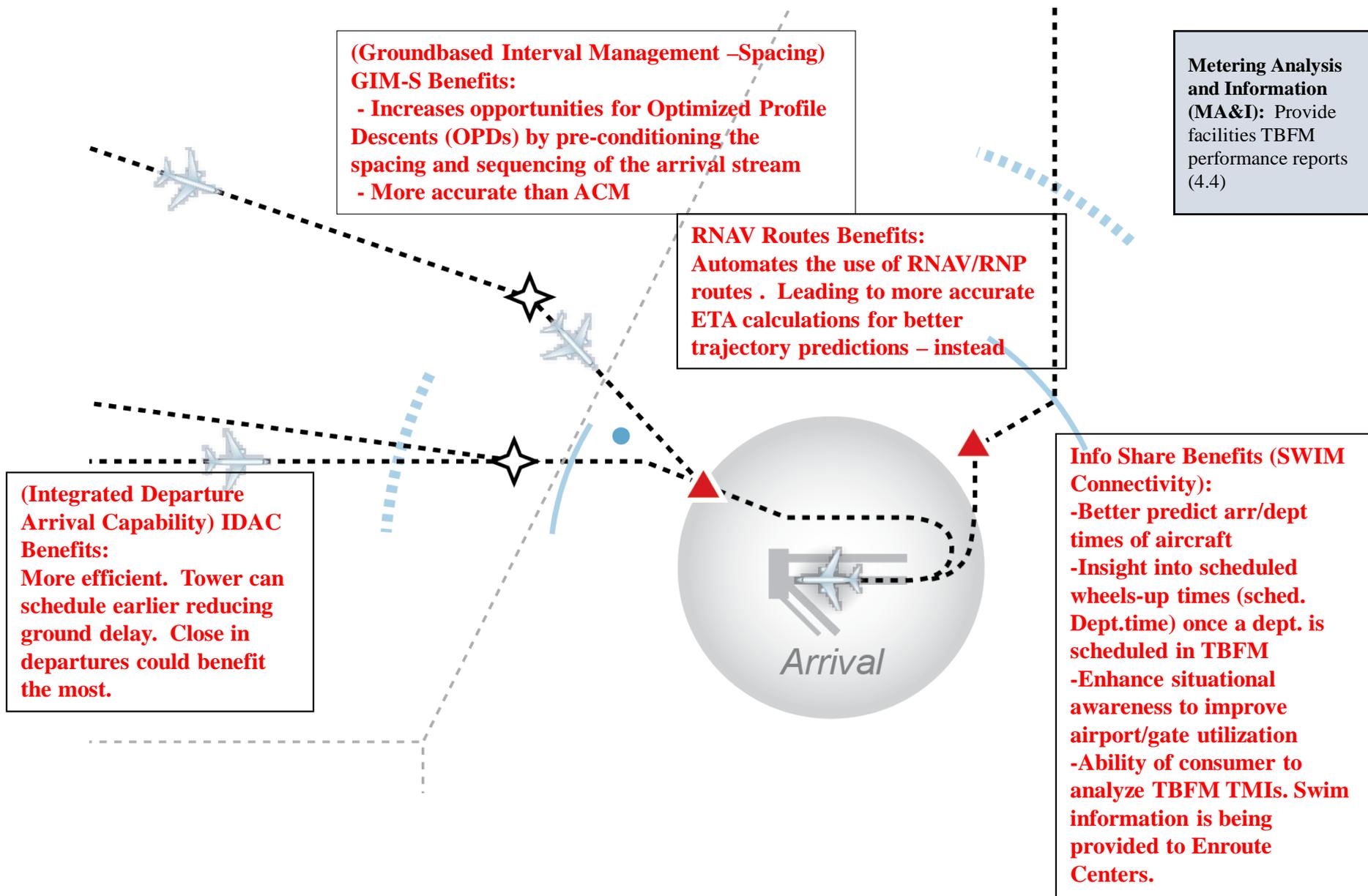
**Arrival Management:** Graphical depiction of flows and timing into a terminal.



Rendering is notional – not drawn to scale.  
Source: MITRE CAASD



# Advanced Capabilities in Progress (Near Future)



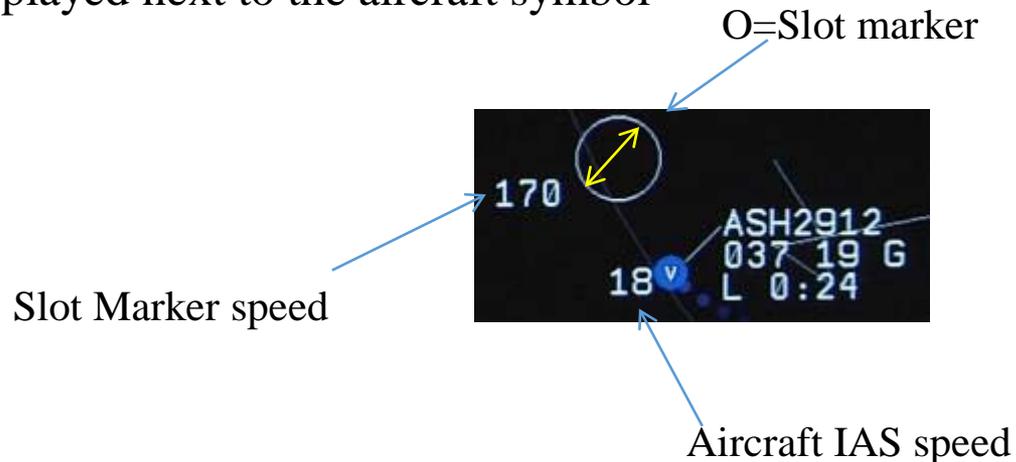
# Advanced Capabilities in Progress (Near Future) cont.

## TSAS (Terminal Spacing and Sequencing)

Spatial circular targets on the display indicate where an aircraft should be at a given time if it were to:

- ❖ Fly the RNAV route through the forecast wind field
- ❖ Meet all published speed and altitude restrictions
- ❖ Arrive on time at its STA to the merge point or runway

The slot marker speed is displayed next to the slot marker, the current IAS is displayed next to the aircraft symbol



# TBFM Supports PBN

- TBFM changes from strictly a demand/capacity tool to one that also supports routine use of PBN
- TBFM enables the smooth and orderly flow of aircraft to meet the tolerances of “optimized” procedures and capacity limitations of airspace, TRACONs, runways allowing controllers to efficiently achieve the spacing and flow rates
- Present capabilities are a first step in introducing automation that assists controllers in producing a regulated flow
  - ❖ Departure Scheduling enables departing aircraft to seamlessly join an arrival flow
  - ❖ En Route departure capability times departing aircraft to join and meet an airborne restriction
  - ❖ Arrival time based metering provides controllers awareness of a Scheduled Time of Arrival to condition the flow while accounting for other flows to the runway

# TBFM Action Plan Progress

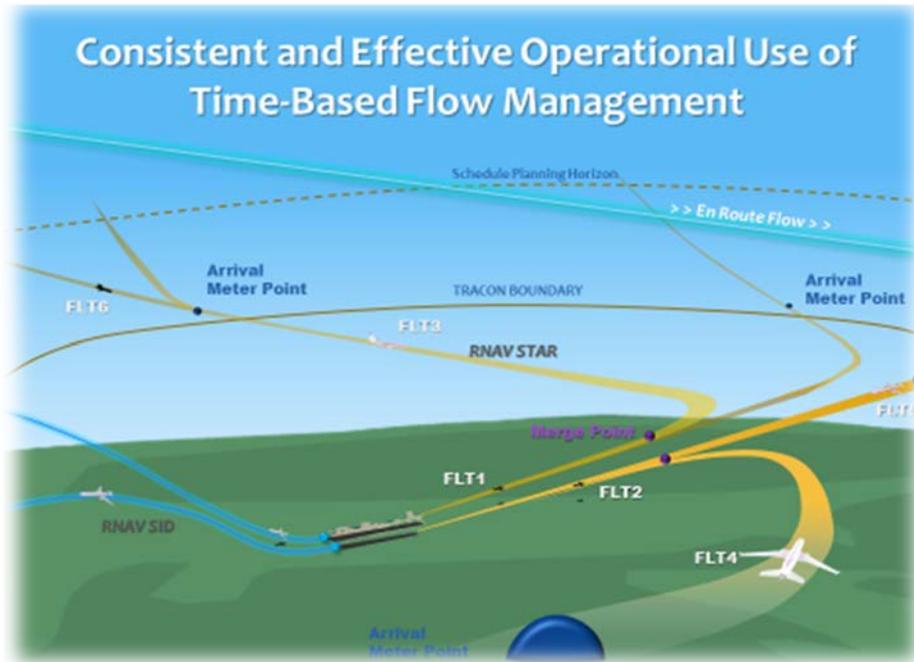
Targeted TBFM Objectives	Progress
Vision	<p>Completed Vision:</p> <p><i>The vision for TBFM is the expanded use of time-based metering to enable gate-to-gate improvements in both fuel and throughput efficiencies by applying spacing only where needed allowing for the routine use of Performance Based Operations (PBO) to capitalize on cockpit Flight Management System (FMS) capabilities adding more predictability to the ATC system.</i></p>
Unified Direction	<p>Complete</p> <ul style="list-style-type: none"> <li>❖ ATP Future Procedures Group single point of contact for TBFM.</li> </ul>
Policies and Procedures	<p>Completed</p> <ul style="list-style-type: none"> <li>❖ TBFM Policy and Procedures were published as Notices Dec 10, 2015 and will be incorporated into the 7210.3Z and 7110.65W in May 2016.</li> <li>❖ Use Policy:            “When departure and or arrival flows are subject to TMI’s, or when supporting PBN procedures, TBFM must be used to the maximum extent feasible in preference to miles-in-trail initiatives”</li> </ul>
Training	<p>Controller/FLM-Completed TMC/STMC-Completed</p> <ul style="list-style-type: none"> <li>❖ 6,158 En route controller completed eLMS course</li> <li>❖ 3,315 Terminal controllers completed eLMS course</li> <li>❖ 120 individuals completed the 7 day TMC/STMC in FY 2015 , target completion FY 2017</li> </ul>
Culture and Communication	<p>In Progress</p> <ul style="list-style-type: none"> <li>❖ Articles published My FAA &amp; FAA Focus, TBFM field/facility POC,s identified, distributing TBFM posters to field facilities and working with FAA Communications on consist TBFM messaging</li> <li>❖ Customer Forum</li> <li>❖ Customer TBFM Demonstration Day</li> </ul>
System Management	<p>In Progress</p> <ul style="list-style-type: none"> <li>❖ PMO advanced TBFM training for FAST Team</li> <li>❖ PR being reviewed daily</li> </ul>
Outcome Analysis	<p>In Progress</p> <ul style="list-style-type: none"> <li>❖ Possible 3 Tier Metric System</li> <li>❖ Dashboard concept explored</li> <li>❖ Collaboration and meetings continue, AJR-G Performance Analysis</li> </ul>

# Questions

## *What we want to Achieve*

## *NAS Vision for TBFM*

### Consistent and Effective Operational Use of Time-Based Flow Management



*The vision for TBFM is the expanded use of time-based metering to enable gate-to-gate improvements in both fuel and throughput efficiencies by applying spacing only where needed allowing for the routine use of Performance Based Operations (PBO) to capitalize on cockpit Flight Management System (FMS) capabilities adding more predictability to the ATC system.*

# Wildlife Surveillance Concept (WiSC)

## *Concept Overview*



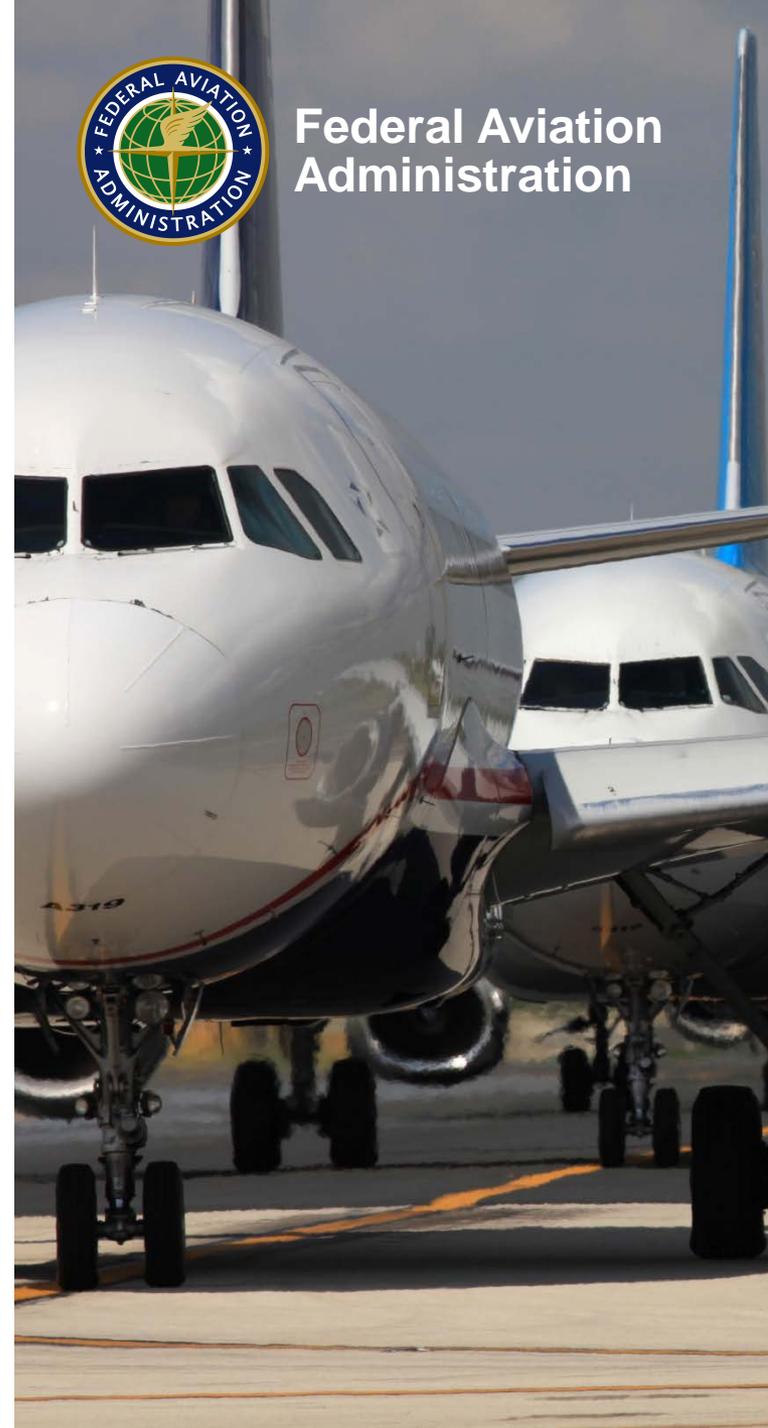
Presented to: Air Traffic Procedures Advisory Committee

By: Anton Koros, ANG-C54

Date: February 24, 2016



Federal Aviation  
Administration



# WiSC ATPAC Briefing Outline



- Background
- Shortfall
- WiSC Overview
- WiSC Research
- Next Steps



***Background***

# Avian Radar Research



- 15+ years of avian research by government and industry
- Airport Technology R&D Branch (ANG-E261) sponsored work
  - University of Illinois Center of Excellence for Airport Technology (CEAT)
  - USDA/Animal and Plant Health Inspection Service/Wildlife Services
  - ANG-C Advanced Concepts/WiSC

- Research use by Wildlife Biologist/Airport Operations:

- Seattle-Tacoma Airport
- Dallas Fort-Worth Airport
- Coming soon to Boston Logan Airport



# Avian Radar Displays (Airport Ops)



# WiSC ATPAC Briefing Outline

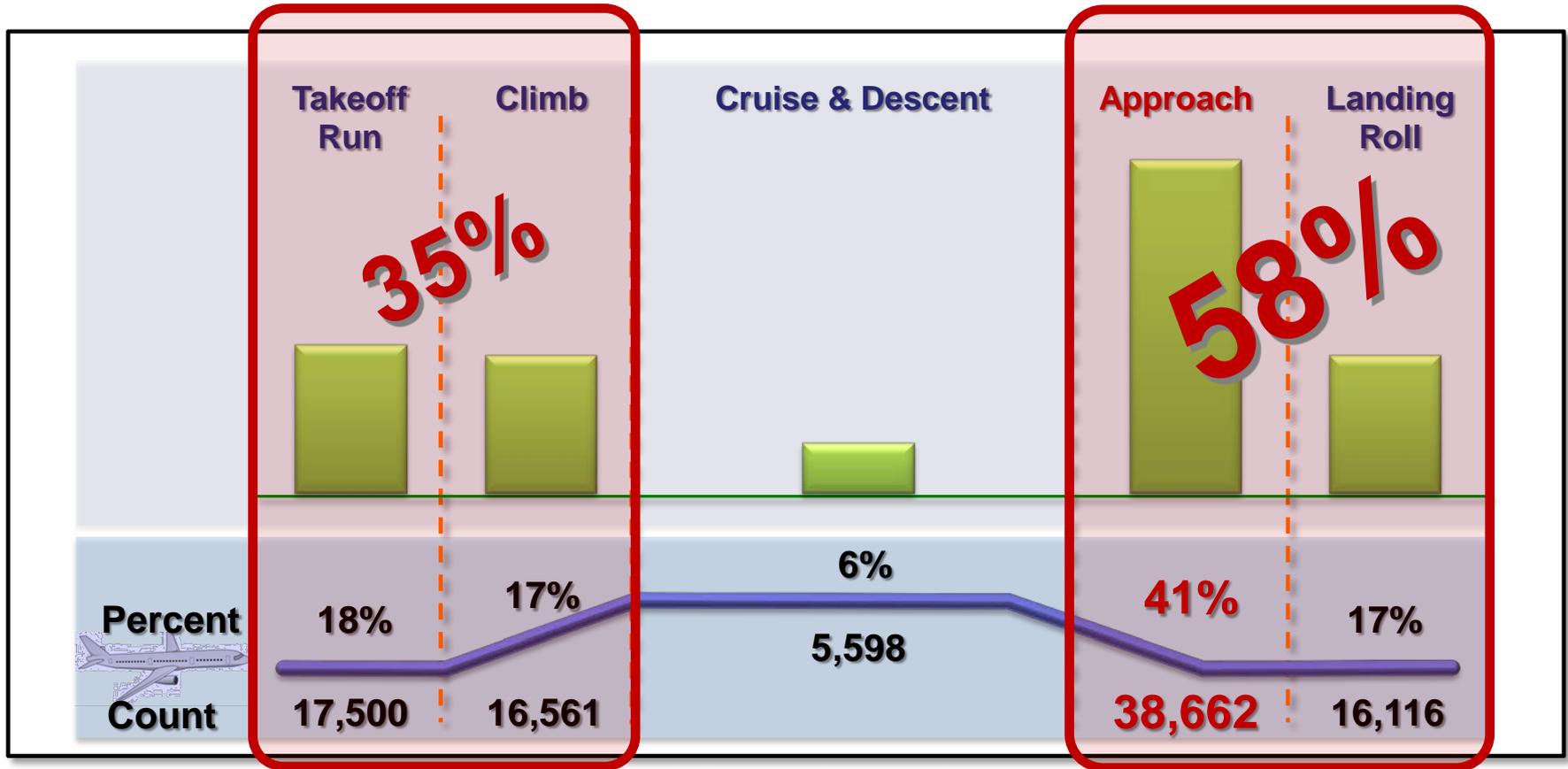


- Background
- **Shortfall**
- WiSC Overview
- WiSC Research
- Next Steps



***Shortfall***

# Bird Strikes by Phase of Flight



\* Wildlife Strikes to Civil Aircraft in the United States 1990–2013 (FAA 2014) (Table 9)

**95% of bird strikes occur below 3,000 feet AGL and within 5 nmi of airfield**



On average 30+  
bird strikes are  
reported each  
day (2014)

Range in mi  
Speed in mph  
North is up  
3 sigma ellipses



The news  
reports say  
avian radar  
is available  
today...

12:52 PM

Accipiter  
Radar Technologies Inc.

# WiSC ATPAC Briefing Outline



- Background
- Shortfall
- **WiSC Overview**
- **WiSC Research**
- **Next Steps**



## *WiSC Overview*

# WiSC Overview



## Wildlife Surveillance Concept (WiSC)

- Investigates the introduction of precise avian threat information into the ATCT environment
  - Commercially available radar systems identified in Advisory Circular 150/5220-25

## Objectives

- Increase safety by reducing damaging strikes
  - Improved avian threat detection
  - Improved avian threat information quality passed to the flightdeck
  - Improved ATC procedures for disseminating avian threat information

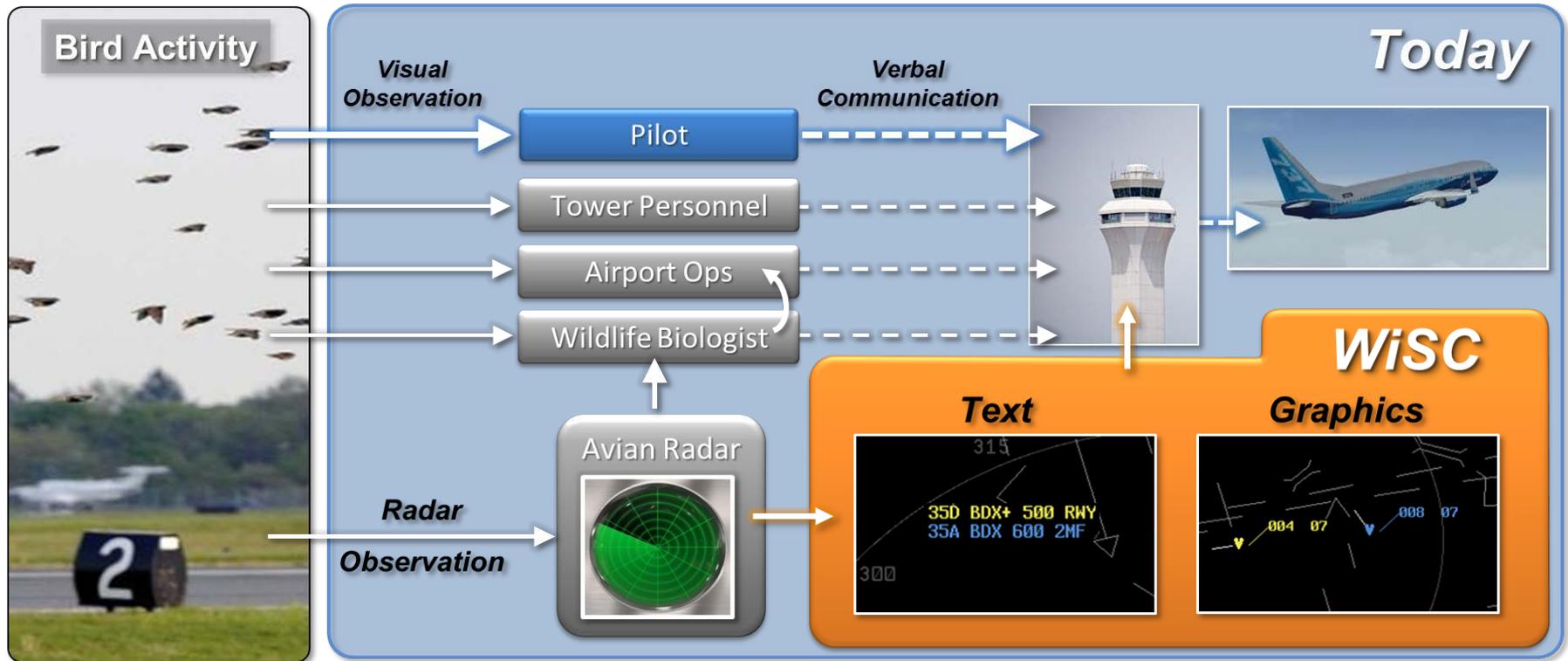


Avian Radar at  
Dallas/Forth Worth  
International Airport  
(DFW)



Avian Radar at  
Seattle-Tacoma  
International  
Airport (SEA)

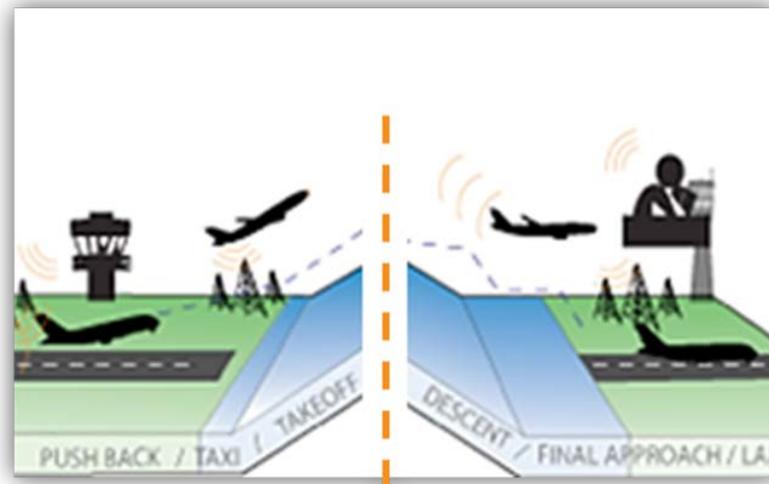
# Concept Overview



# Concept Overview



- WiSC provides recommendations on how to best present supplemental bird threat information to ATCT users
  - Information Needs
    - Bird threat characteristics (e.g., speed, attitude, type, etc.)
  - Display Requirements
    - Type of display (graphic, text, other)
    - Display system (STARS, IDS, new)
  - Procedural recommendations for disseminating bird threat information
    - Alerting parameters (defining a true “threat”)
    - Dissemination of bird advisories (what and when)



Airport traffic control tower domain

Bird threat information still advisory

# Limitations in Current Operations

- Current limitations affect:
  - Ability to detect avian threats
  - Quality of bird threat information disseminated to aircraft
  - Controller workload and time

*Sampling bird activity with humans*

[1]



Busy air traffic control tower

*Human perception of bird threat*

[2]



Tower viewing birds from afar

*Procedures for threat dissemination*

[4]



[5]



Tower issues advisory/continuous query

# Limitations in Current Approach



## Human Limitations in Sampling Bird Activity

- Competing duties
- Time delay in threat assessment and communication
- Frequent updates of position/altitude required

## Human Limitations in the Perception of Bird Threats

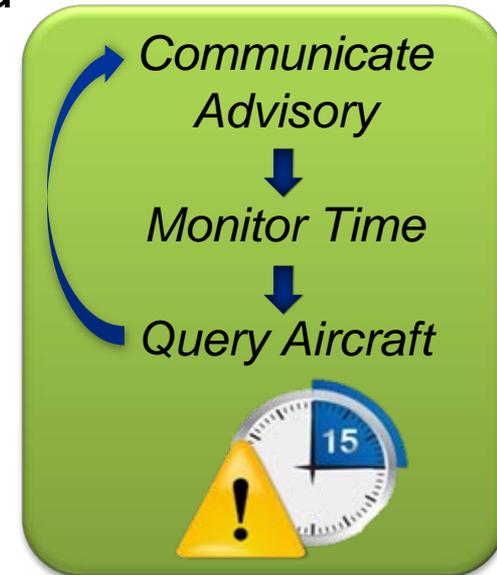
- Limited field of view
- Detection abilities fall off rapidly with distance
- Visual parallax creates errors in perceived location/heading
- Visual exposure to birds is fleeting (especially for pilots)
- Low visibility & night operations do not allow for bird detection

# Limitations in Current Approach

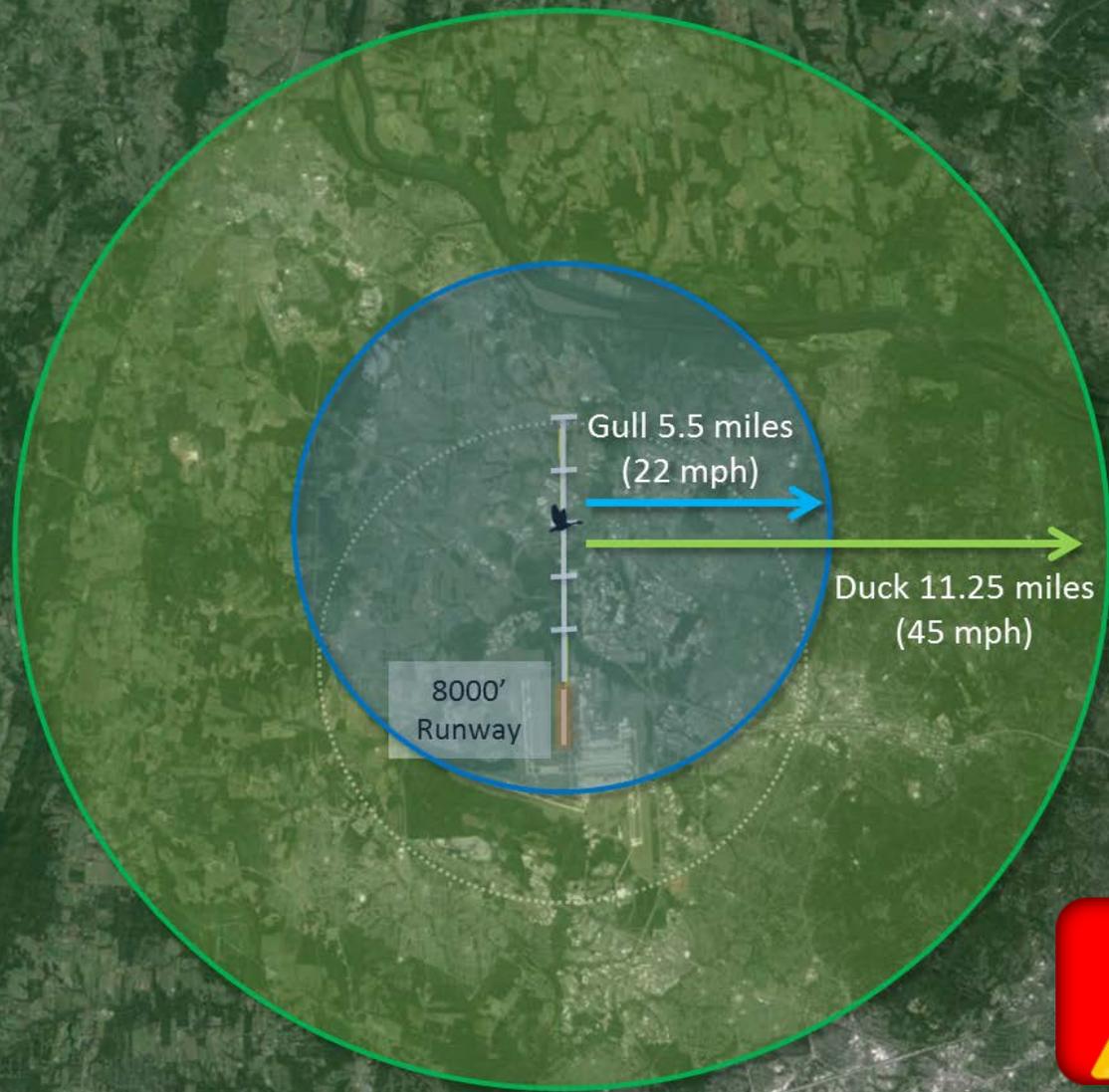


## Procedural Limitations

- Controller must communicate advisory for 15 minutes, or until determined to no longer be a factor
  - Increases communications & workload
- Controllers must keep track of 15 minute period
  - This monitoring task requires sustained attention and affects workload
- Controllers query subsequent aircraft to obtain updated position and altitude information
  - Information accuracy quickly degrades over time (position, altitude)



# Distance Traveled in 15 Minutes



# WiSC Benefits



- **Improved threat detection**

- Bird threat information is obtained by the controller sooner allowing them to be proactive as opposed to reactive
- Eliminates the reliance on visual observation/confirmation of birds
- Allows bird detection during low visibility/night operations
- Reduces cognitive demand



# WiSC Benefits



- **Improved information quality**
  - Precise position and altitude information
  - Accurate size (biomass) and direction of flight information
  - Pilots are able to make more informed decisions and prepare appropriately



# WiSC ATC Benefits



- **Improved procedures**

- Display only significant avian threats to controller
- Relieve 15 minute reporting period when possible
- May reduce bird-related communications over the frequency
- Reduced workload related to bird threat management



***Not Significant***



**Bird strike threat is a function of biomass of threat and its proximity to an aircraft**

# WiSC ATC Briefing Outline



- Background
- Shortfall
- **WiSC Overview**
- **WiSC Research**
- Next Steps



***WiSC Research***

# WiSC Research



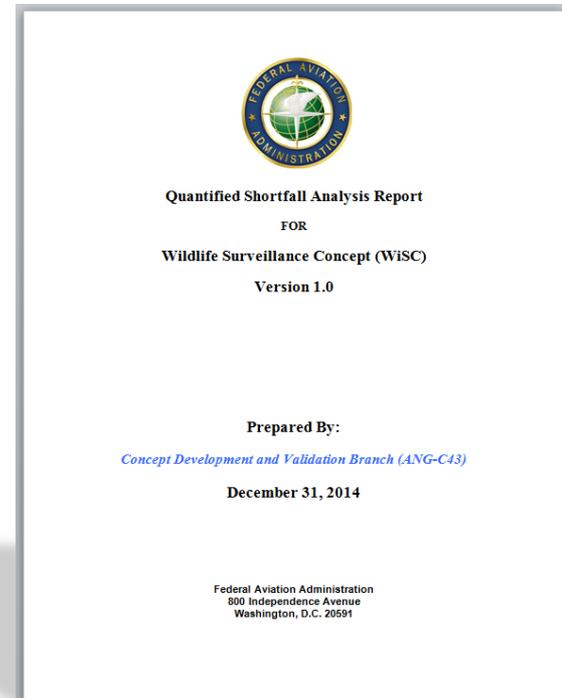
- Multi-Phased effort initiated in September 2013
- Major Research Activities
  - Literature Review Database
  - Subject matter expert panel
  - Site visits
  - Technical Interchange Meeting
  - Shortfall Analysis
  - Laboratory HITL Demonstration
- Planned Research Activities
  - Business Case Analysis based on field observation
  - Bird Strike Conference Paper/Presentation
  - Preliminary Requirements

# Shortfall Analysis



- Estimated monetary value of the safety shortfall from the inability to identify bird threats and prevent bird strikes
- Based on 20 year lifecycle
- Leveraged data from FAA Wildlife Strike database
- Average annual costs \$260M

**December  
2014**



# SME Panel



- **CPCs, FLMs, & commercial Airline Pilots (2 each)**
  - Scenario walkthroughs (5)
  - Reviewed notional interfaces (graphical, textual)
  - Rated avian threats, value of supplemental bird threat information
- **Key focus areas were identified**
  - System accuracy, ATC system options, Information Display and Interface Design Options, Procedural and Workload Considerations

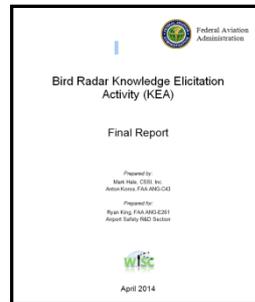
## Scenarios

**Scenario A: Steps**

Scenario Atmosphere:  
Type: Tower, Departure, Ops Report  
Time: Nighttime  
Visibility: > 10 miles  
Sky: Clear  
Workload: Moderate

Actor	Event
1 Airport Operations	An airport ops construction crew hears a flock of Canada Geese passing north to south at low altitude.
2 Airport Operations	Crew member picks up radio and contacts ATCT and notifies them of bird activity crossing midfield runway 27L at about 100-300 feet.
3 Pilot	USAIR123 stabilizes on departure route.
4 Local Controller	The local controller contacts USAIR123 and asks if they observed bird activity on departure.
5 Pilot	USAIR123 reports that they did not.
6 Local Controller	The controller clears the next departure DAL456 and notifies them of bird activity was reported midfield on 27L at 100-300'.
7 Pilot	DAL456 pilot advises that they would like to wait 2 minutes for activity to clear

## Final Report



Feb 2014

## Notional Displays

A screenshot of a notional display interface for a Bird Strike Threat. The interface is divided into several sections: 'Graphical' showing a 3D wireframe of an aircraft with a red cone indicating the threat area; 'Textual' showing a table of bird activity data; and 'Diagram' showing a 2D diagram of the aircraft's path. The 'Textual' section contains the following data:

Bird Activity	16R	16L	16L
Dep	High	2130	
App	Med	2102	
App	High	2019	

Legend: Moderate (yellow square), Severe (red square)



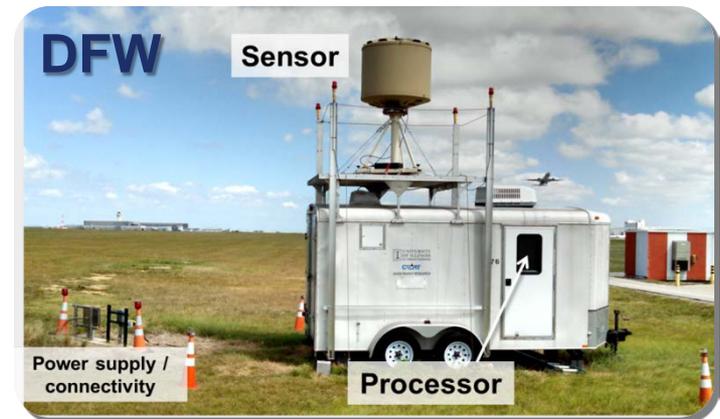
# Site Visits



- Met with Airport Operations personnel, ATC supervisors, TMCs, & CPCs
  - Controllers currently learn of avian threats primarily via pilot reports
  - Coordination & collaboration between ATC and airport operations personnel is limited
- ATC saw value in having more precise bird threat information
- ATC open to multiple presentation options



Aug/Sep  
2014



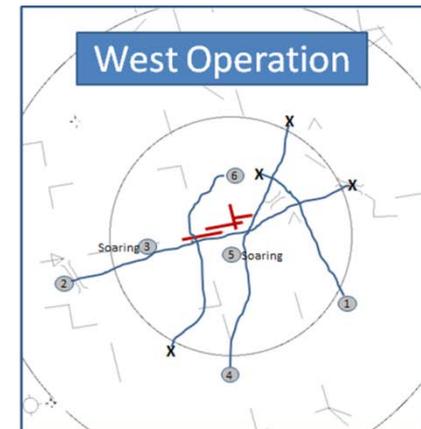
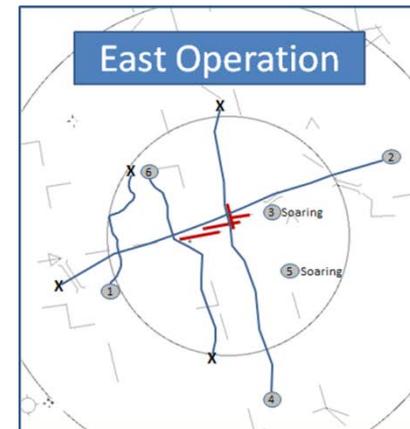
# WiSC Research



- **HITL Laboratory Demonstration**  
5 NATCA controllers participated
  - PHL with realistic bird events
- **HITL Purpose**
  - Elicit controller feedback on methods of presenting bird threat information to ATC
  - Examine differences in performance and workload measures between conditions
  - Inform Concept of Operations development



*Tower Simulator (Human Factors Laboratory)*



**May 2015**

# WiSC Presentation Methods



1. **Baseline** – pilot report (PIREP) like today

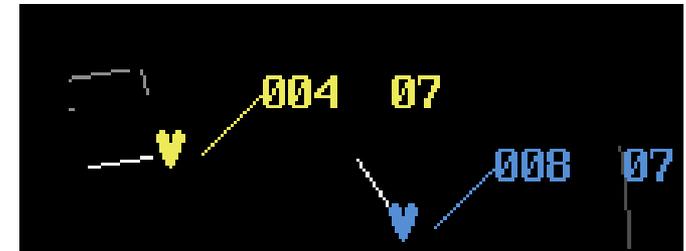
## 2. Text

- Like Low Level Windshear Alert System (LLWAS)
- Presented on STARS (upper left)
- Accompanied by an audible alert

35A BDX 600 2MF  
27LD BDX+ 600 2MD

## 3. Target

- Presented on STARS
- Filtered radar targets



## 4. Supervisor

- Presented on paper strips
- Same information as text condition

2115 8D/9LD BDX 600 RWY

# Findings



- Who should receive avian threat information?
  - Controllers
  - Supervisors
- Where should the information be displayed?
  - Primary radar display
  - IDS
  - LLWAS
  - Other
- How should the information be presented?
  - Target
  - Text

\* Hybrid Text-Target solution suggested by participants

# WiSC ATPAC Briefing Outline



- Background
- Shortfall
- WiSC Overview
- WiSC Research
- Next Steps



***Next Steps***

# Next Steps



ANG-E261 is continuing to fund:

- Ohio University
  - Examine ways to filter and format data to disseminate avian radar messages
- Center of Excellence for Airport Technology (CEAT)
  - Site installation research
  - Radar performance research
- Advanced Concepts Branch (ANG-C54)/CSSI, Inc.
  - Avian radar deployment at BOS (SRC's BSTAR)
    - Investigate site-specific considerations
    - Capture early user information needs



# Next Steps



Advanced Concepts Branch (ANG-C54)/CSSI, Inc./MCR

- Conduct benefits/business case for avian radar based on BOS deployment
  - ATC and Airport Operations
- Work with vendor to develop the best filtering options for avian threats in real-world environment
- Continue socialization of WiSC in government, academic, and industry forums

# Questions?



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