Welcome to the SWIM Users Forum #23

Before we get started…

- If you wish to speak directly to the attendees, enter your audio PIN. Don't have one? Ask us to send you one in the "Questions" box.

- The presentation you'll see today will be posted on the SWIM Users Forum page:

www.faa.gov/air_traffic/technology/swim/users_forum

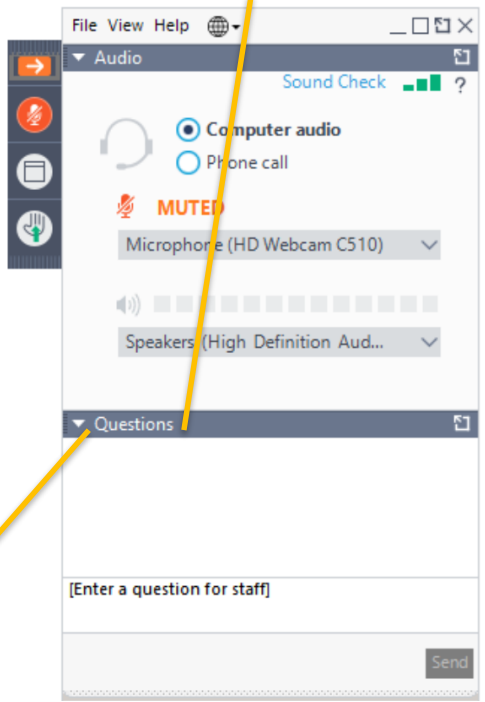
- How well do you know SWIM? Watch for the "SWIM Feud" image and make your guesses. The answers will be revealed at the end of the presentation.

OK, first question:

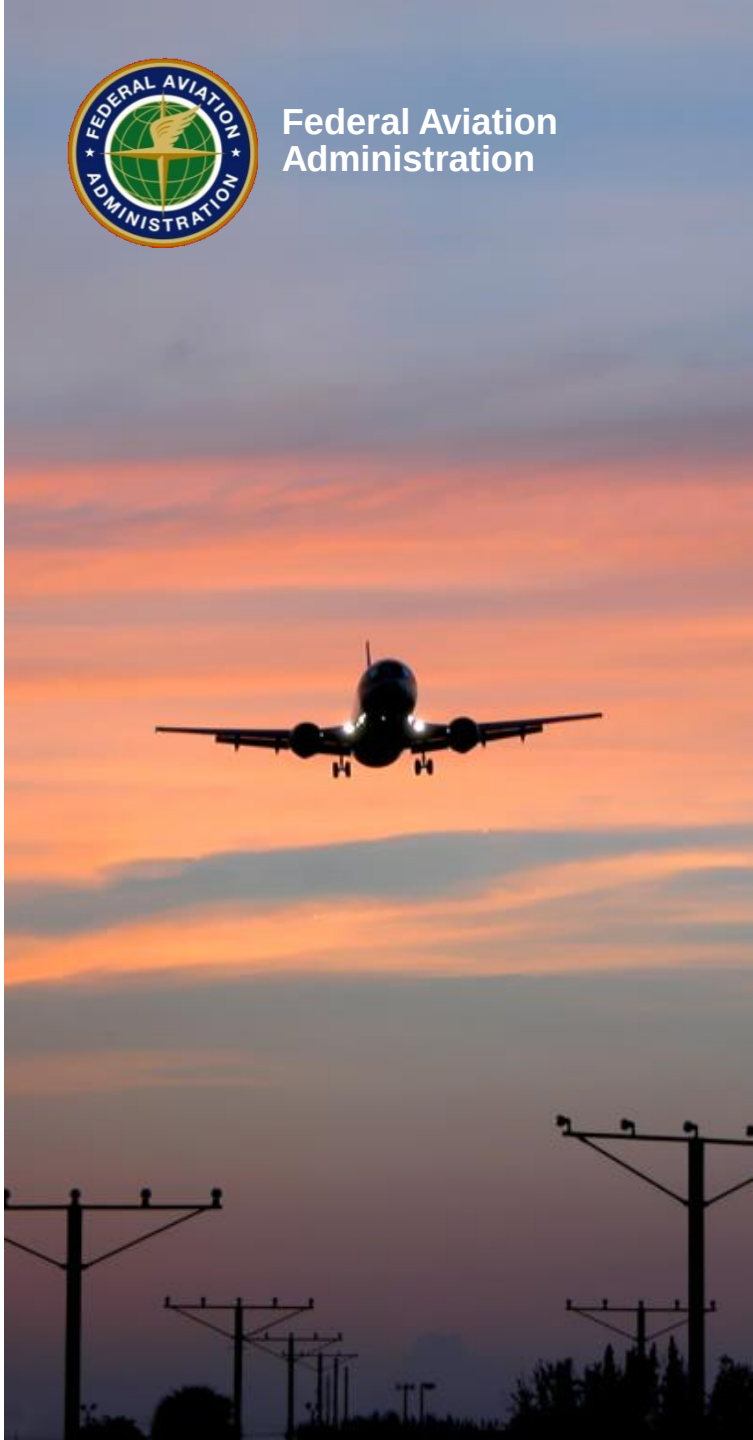
Where can you learn more about SWIM?

You may enter your guesses in the "Questions" section of the toolbar.

Got questions or concerns throughout the forum? Type them here.



SWIM Users Forum #23



Presented by: SWIM Program Office

Date: October 11, 2018

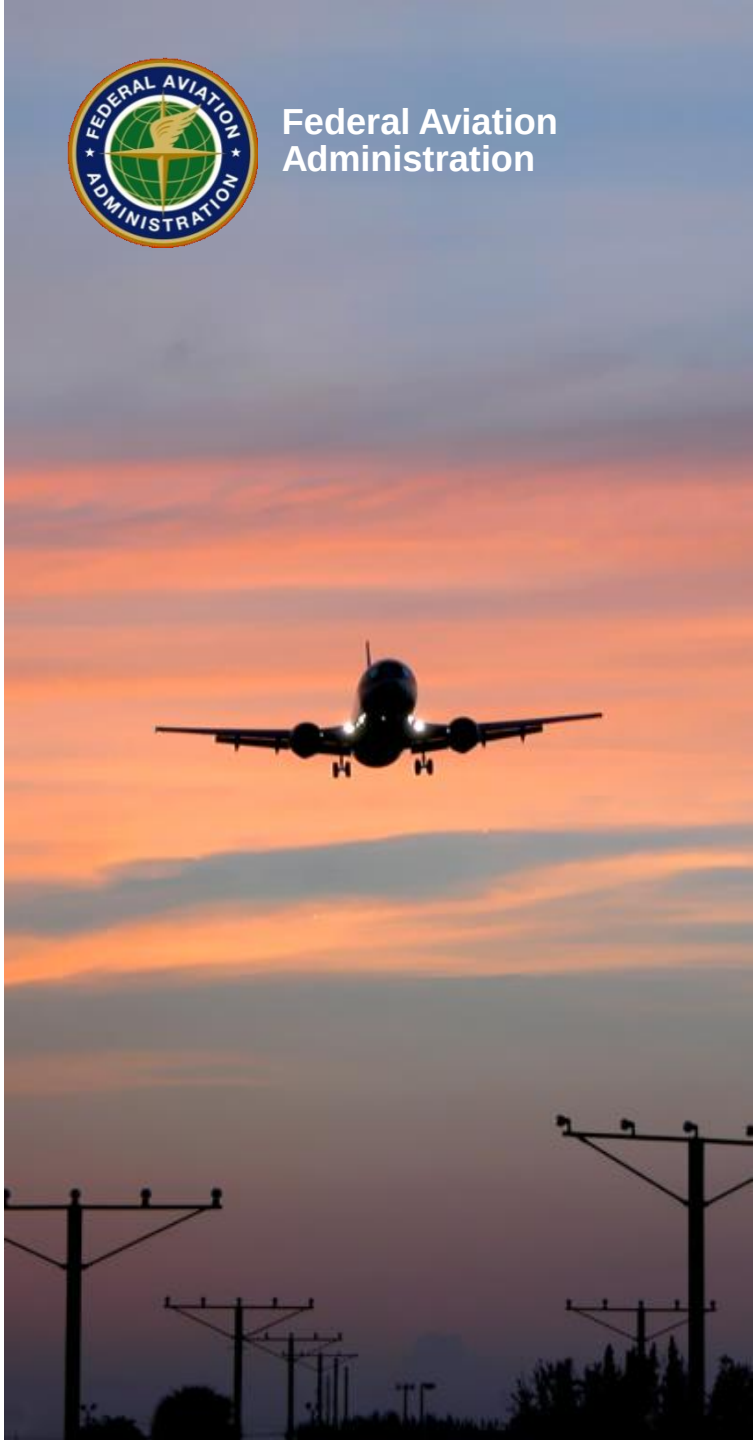
Washington, DC

Today's Agenda

- **Welcome**
  - Melissa Matthews, Acting SWIM Program Manager
- **ATCA Annual Recap**
- **A STDDS Update**
- **An announcement from the TFDM Program**
- ***What can be done with the data?* MITRE presents Mobile Clearance Delivery**
- **What are your questions? Let us know.**

An ATCA Recap

Presented by: SWIM Program Office



Volpe USDOT Retweeted

The FAA @FAANews · Oct 2

Are you at #ATCA63? Stop by Booth 718 and talk to our experts about #SWIM. It provides access to #aviation information through a single connection.

Volpe USDOT @VolpeUSDOT · Oct 1

Josh Gustin: There are non-aviation, other uses of SWIM data that we never thought about before. We weren't talking about cab drivers who want to know when a big plane is about to land. Now we have industries being born out of this. volpe.dot.gov/sites/volpe.do... ... @FAANews #ATCA63

SWIM Streamlines Data Sharing Among Key Partners

The Volpe Center and FAA System Wide Information Management (SWIM) are partnering to develop and deploy services that enhance information exchange across the aviation enterprise using defined, standardized, secure, and scalable connections. SWIM delivers key information whenever and wherever it is needed, within FAA and between FAA and its partners, including air carriers, general aviation, and the military.

A Volpe team leads development of several enterprise services critical to SWIM, including the SWIM Terminal Data Distribution Service, SWIM Flight Data Publication Service, and the Integrated Terminal Weather System.

FAA also relies on a Volpe team to develop the newest SWIM service, the NAS Common Reference (NCR). Targeted for initial operating capability in March 2020, NCR will enable customized requests for weather, aeronautical, and traffic flow information, correlated both temporally and spatially.

In addition, FAA turns to the Volpe Center to apply its aviation expertise through system development and testing, data visualization tools, industry data formats, and cloud technologies and services.

FAA Safety Briefing

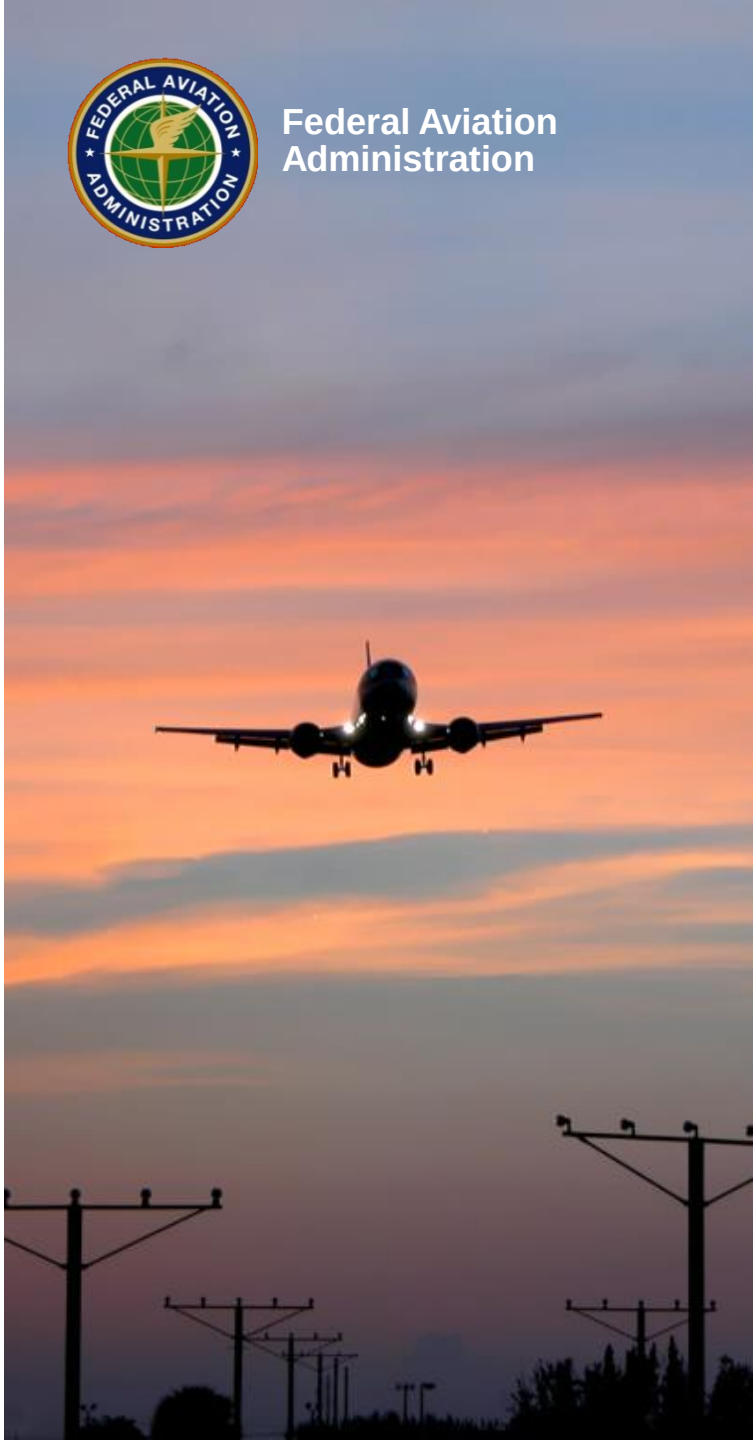
Some Highlights:

- "SWIM Users Unite!"
- NAS Common Reference
- A video tour of SCDS

Volpe USDOT @VolpeUSDOT · Oct 3

The runway's in sight but there's still time before we land to come by booth 714 at #ATCA63. Meet @USDOT #VolpeCenter experts in #UAS #humanfactors #atc and more, and chat about advancing the safety, efficiency, and sustainability of #aviation volpe.dot.gov/sites/volpe.do... @FAANews

SWIM Terminal Data Distribution System (STDDS)



Presented by: SWIM Program Office

STDDS Updates

Name a service offered by STDDS
(There are 4 of them)

- **STDDS R4 Schedule:**
  - STDDS R4 Key Sites complete: Y90 (Jul), PHL (Aug), C90 (Sep)
  - R4 Waterfall to remaining 35 sites October 2018 – January 2019
- **R4 Filtered TDES and TDLS D-ATIS messages now available**
  - Subscribe via data.faa.gov
- **R4 Functionality Dependencies**
  - STDDS R4 includes integration of SFDPS flight plan data to SMES, TAIS, and TDES
    - Enhanced SFDPS data in SMES requires ASDE-X release 10.4.2, which is being deployed during the same time frame as STDDS R4, meaning some sites may not have it initially
    - ASSC sites also require an updated release before enhanced SFDPS data will be available
- **RVR Website Reminder:**
  - http://rvr.fly.faa.gov has moved to http://rvr.data.faa.gov Please update your bookmarks

Terminal Flight Data Manager (TFDM)

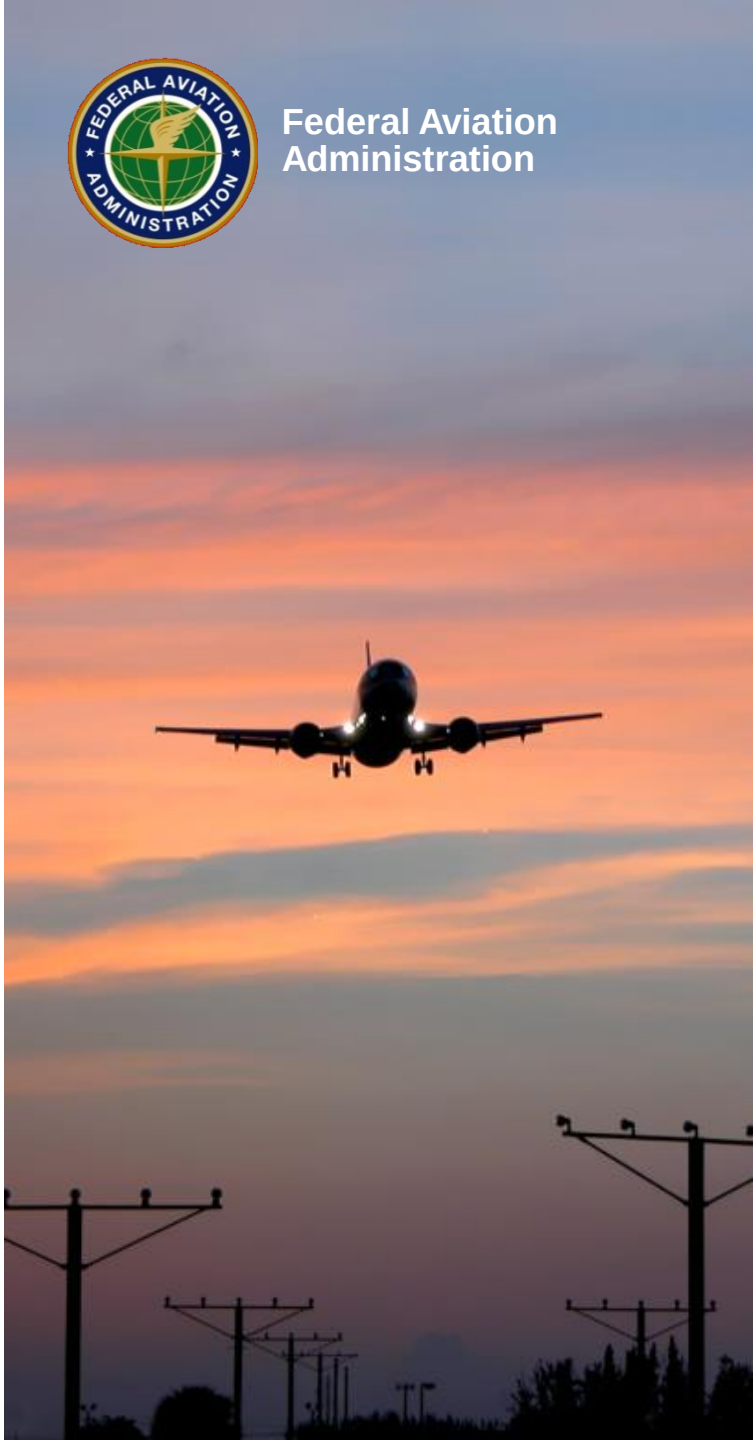
TFDM Terminal Publication (TTP) Service Overview

Presented to: SWIM Users Forum

By: TFDM Program Office (Chris Tracy)

Date: October 11, 2018

Federal Aviation Administration



Agenda:

- Purpose
- TFDM Program Overview
- Configurations
- Sites by Configuration
- TTP Overview
- TFCS Overview
- Additional Resources
- TFDM POCs

Presentation Purpose

- **Provide Information about the TFDM SWIM services including the TFDM Terminal Publication Service (TTP), that is available in the virtual NEMS environment.**
- **Build 1 TTP is now Available**
- **Build 2 updates will be available in 2019**

TFDM Overview

TFDM will be implemented via a multi-build strategy deploying the TFDM capabilities:

Build 1

Full hardware development to support the deployment of Builds 2, improved Electronic Flight Data Exchange and Electronic Flight Strips, Runway Assignment Predictions, Basic Load Balancing, SSA viewer (via TFMS). Maintenance tools for life cycle support.

Build 2

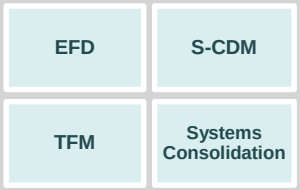
In addition to the Build 1 capabilities will add Surface Scheduling, Surface Metering, Advanced Runway Load Balancing, Metric Reporting & Analysis (MRA), DSP Replacement via TFDM, TBFM, and TFMS.

TFDM Configurations

The 89 Airports chosen for TFDM will receive one of two configurations based on functional need:

Configuration A

27 Sites

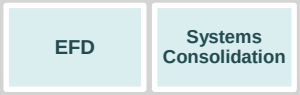


Full Functionality TFDM

- EFD, including electronic flight strips in towers
- Surface surveillance data integration
- Full DSTs (including surface metering)
- TFM data exchange and integration
- SSA on TFMS TMU displays in the TRACON, ARTCC, and ATCSCC

Configuration B

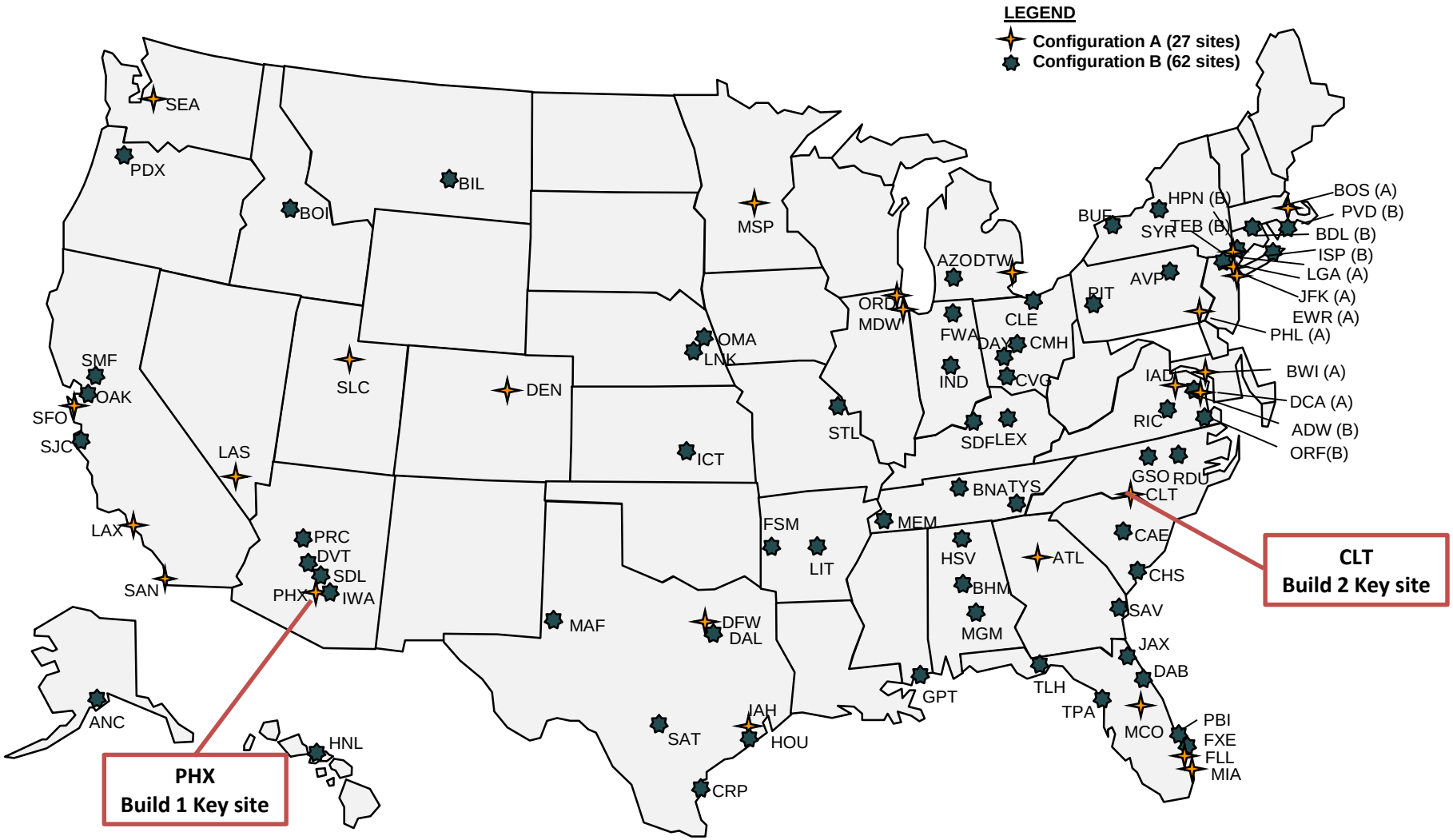
62 Sites



Improved EFD exchange only TFDM

- EFD, including electronic flight strips in towers
- SSA capability on TFMS TMU displays at selected sites

Implementation Sites by Configuration



TFDM Terminal Publication (TTP) Service (Build 1)

- **Flight Data:** The Flight Data service provides flight specific information for flights departing from and arriving at a TFDM enabled airport. Data includes detailed surface state information and actual times at those states.
- **Airport Information:** This includes current and future runway configurations, departure and arrival rates, runway and taxiway closures and surface delays.
- **Operational Metrics Data:** This includes TFDM preset Key Performance Indicators (KPI) generated reports including Phase of Taxi Operations (per Flight)
- **Traffic Management Restrictions:** The Traffic Management Restrictions service provides information about various restrictions and the flights affected by them. Restrictions include Miles in Trail, Minutes in Trail, Departure Stops and APREQs. This can included locally (at the specific TFDM airport) entered Traffic Management Restrictions not reflected in Traffic Flow Management Systems

TFDM Terminal Publication (TTP) Service (Build 2)

- **Flight Data:** The Flight Data service provides flight specific information for flights departing from and arriving at a TFDM enabled airport. Data includes detailed surface state information, actual times at those states, predicted times (configuration A), and metering times (configuration A).
- **Airport Information:** This includes current and future runway configurations, departure and arrival rates, runway and taxiway closures, deicing information (configuration A) and surface delays.
- **Operational Metrics Data:** This includes TFDM preset Key Performance Indicators (KPI) generated reports including
  - Configuration A
    - Flight Data Quality (per Flight)
    - Metering Read Time Compliance (per Airport and per Flight)
    - Metering Time Compliance (per Airport and per Flight)
    - Metering Hold Data(per Airport and per Flight)
    - Actual vs Predicted Flight Times (per Flight)
    - Stability of Metering Times Data (per Flight)
  - Configuration A and B
    - Phase of Taxi Operations (per Flight)

TFDM Terminal Publication (TTP) Service (Build 2)

- **Traffic Management Restrictions:** The Traffic Management Restrictions service provides information about various restrictions and the flights affected by them. Restrictions include Miles in Trail, Minutes in Trail, Departure Stops and APREQs. This can included locally (at the specific TFDM airport) entered Traffic Management Restrictions not reflected in Traffic Flow Management Systems.

- **Surface Metering Programs (configuration A):** The Surface Metering Program service provides parameters, notifications, and information related to the Affirmed and Recommended Surface Metering Programs for a TFDM airport. This information includes the list of affected flights.

TFDM FOS Collaboration Service (TFCS) Build 2 and Configuration A

- **The TFDM FOS Collaboration Services handles requests submitted by the Flight Operator System group of users. Functionality categorized into Airport Resource Data (ramp and apron status) and Surface Metering Program (SMP) Flight Substitution Requests.**

Additional Resource

For more information on TFDM, view the TFDM video via the link below:

https://www.faa.gov/air_traffic/technology/tfdm/

TFDM Program Points of Contact

- **Mike Huffman**
  - TFDM Program Manager
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  - (202) 267-0745
- **Rob Hanes**
  - TFDM Deputy Program Manager
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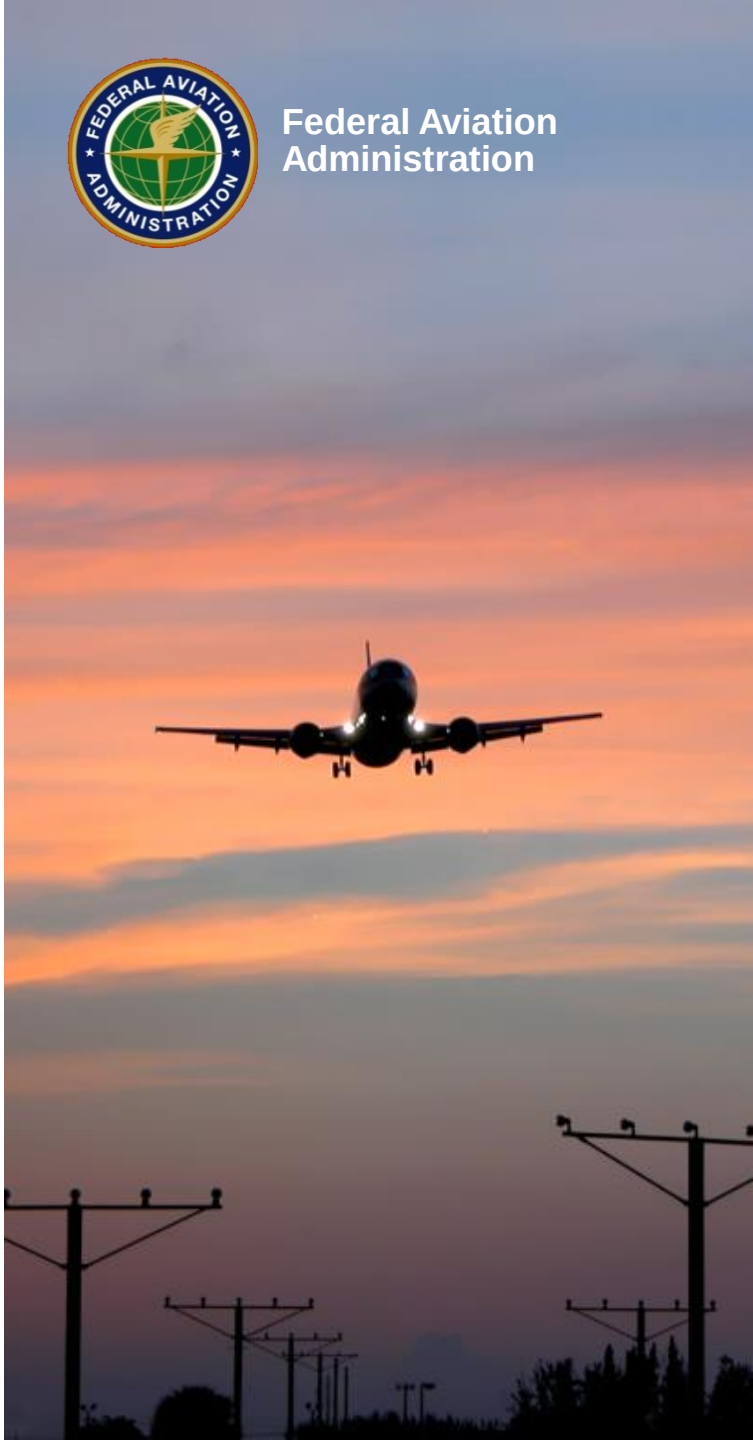
  - (202) 267-0250
- **Chris Tracy**
  - TFDM Systems Engineering Lead
  - chris.tracy@faa.gov
  - (202) 267-0725

How many messages does SWIM produce each day?

Mobile Expected Clearance Test at Manassas Regional Airport

Federal Aviation Administration



Presented to: SWIM Users Forum

By: MITRE (Paul Diffenderfer, Kevin Long)

Date: October 11, 2018

Mobile Expected Clearance Test at Manassas Regional Airport

Briefing for SWIM Users Forum

October 11, 2018

Paul Diffenderfer
Kevin Long

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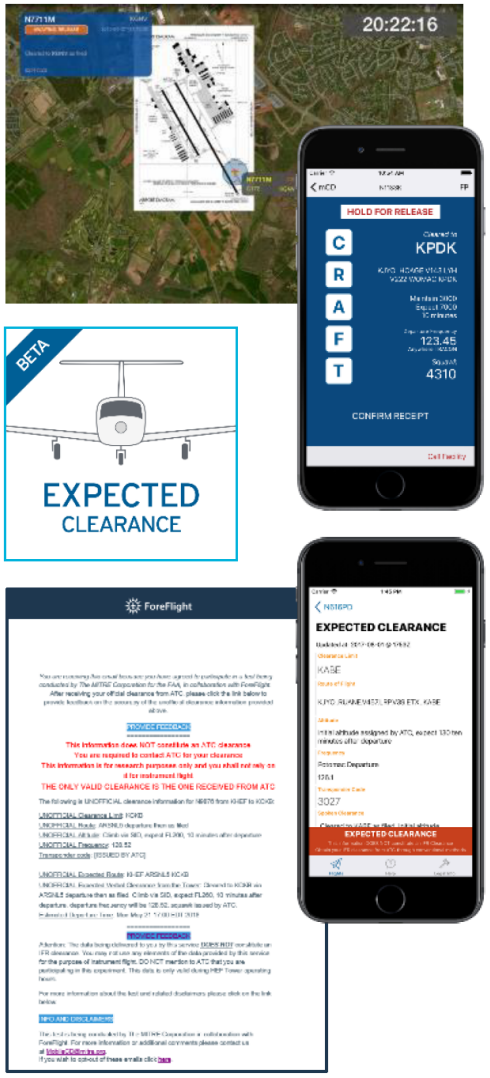
MITRE

History of MITRE Mobile Clearance Delivery Work

- **FY 2015**
  - MITRE Sponsored Research (MSR) focused on larger concept
- **FY 2016**
  - Mission Oriented Innovation & Experimentation (MOIE) funded project focused on processing SWIM data for towered and non-towered airports
  - Added CDM data exchange which led to connection with NASA Airspace Technology Demonstration (ATD)-2 work at Charlotte Douglas Airport
- **FY 2017**
  - MOIE focus changed to clearance delivery only at towered airports
  - Pilot app beta test with small group – no ATC interaction
  - Began industry engagement – research agreement with ForeFlight
- **FY 2018**
  - Partially-funded MOIE focused on CD field test at Manassas Regional Airport (HEF)
  - New NextGen OI added – Improved Departure Operations using Mobile Applications (2025-2030)
- **FY 2019**
  - Conducting this work cooperatively with other MITRE mobile work
  - Investigating mobile data safety/security/assurance



Idea – Long Term Vision

HEF Field Test Focused on Clearance Delivery

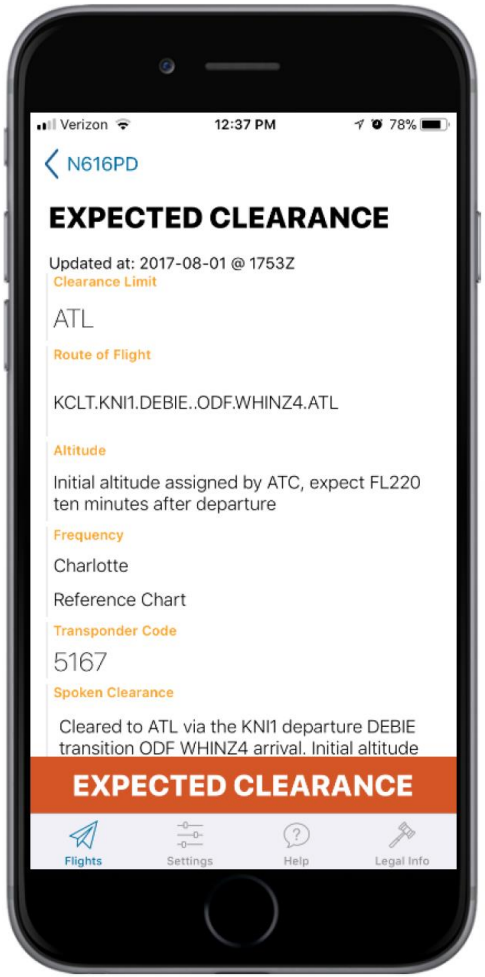
Retrieve IFR Clearance

Negotiate IFR Release

Exchange CDM Info*

Cancel IFR

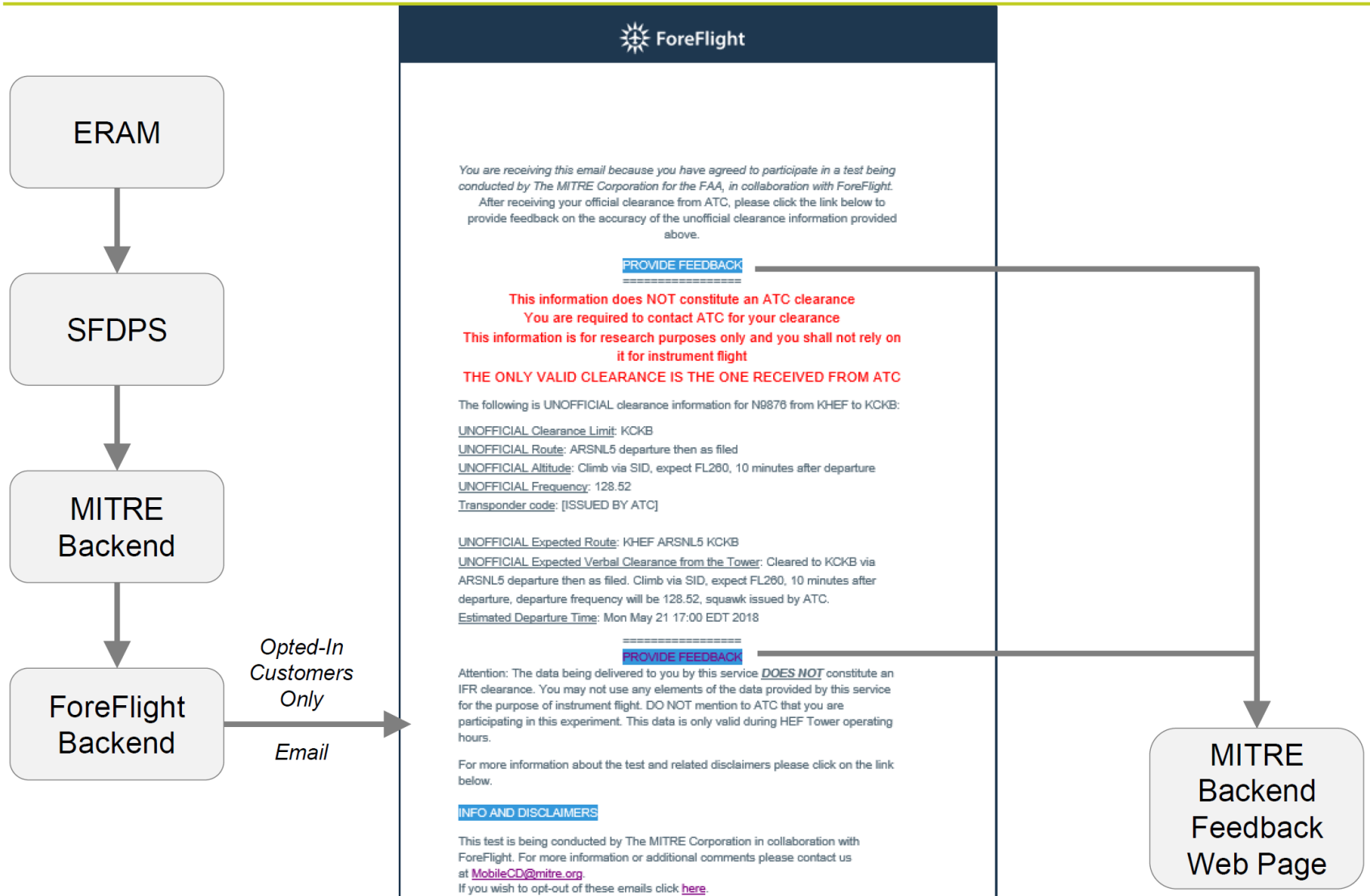
*ATD-2 Evaluations with NASA in Charlotte and Dallas



MITRE Prototype

Could include flight plan loading

HEF Test Email Process



HEF Test Overview

- **Bottom Line Up Front Statement**
  - The Manassas test has proven that it is possible to use SWIM data to formulate expected clearance data and transmit that information to the pilot. Through analysis we have been able to identify mismatches between formulated clearance data and controller verbally-issued clearances, and identify the changes required to reliably send accurate clearance data to the pilot.
- **Test Goals**
  - Using automation, generate accurate “expected clearance” information when compared to clearances provided verbally to pilots
  - Collect feedback from end-users on the accuracy and acceptability of an electronic clearance delivery concept
- **Hypothesis**
  - The clearance generation automation will produce accurate and acceptable results for test participants
  - An electronic clearance delivery capability will reduce readback errors and questions about a cleared route of flight

KHEF Test Overview (continued)

- **Test Procedure**
  - Field test began on 5/16/18 and concluded on 7/29/18 (75 days)
  - The test was designed to be transparent to Air Traffic Controllers and did not impact air traffic operations
  - Participants received expected clearance information via email from ForeFlight
  - Collecting subjective data from participants: match/mismatch, helpfulness, and comments
    - 51 feedback records posted to MITRE website
  - An additional objective review of "expected clearance" data generated by the automation was conducted by MITRE subject matter experts to assess the ability of the system to generate accurate clearance information
    - 438 voice recordings reviewed
- **Participation Status 5/16/18 – 7/29/18 (full test period)**
  - 2253 messages processed by MITRE for 1968 flights (includes IFR & VFR SFRA)
  - These resulted in 2167 potential emails (excludes VFR SFRA)

HEF Test Lessons Learned

Lesson Learned	Mitigation for Next Test
Although the intent remains the same, route phraseology can vary from controller to controller • There are several ways to say the same thing	Avoid sending "spoken" route clearance information to the pilot
Maintaining data integrity is challenging when the controller must augment the ERAM issued route (e.g., add a SID) • Adapting route rules on backend is complex and increases chance of data mismatch	Ensure test site has accurate ERAM pref route adaptation so that what the controller sees on the strip is exactly what is sent to the pilot
SFDPS status may not provide clarity on whether the amendment is pre- or post-departure • SFDPS sometimes shows "active" status when the aircraft has not departed	Change backend software to determine status using other data (e.g., departure time, radar track messages)
Relatively low participation rates • HEF test was with a single vendor (ForeFlight) • HEF is not a very busy airport (avg. 23 IFR/day)	Enlist the participation of more vendors • MITRE is in discussion with an additional major vendor who is interested in participating in the next test

Path Forward

- **We are working through what the next steps might look like:**
  - Crawl-walk-run model to inform safe but productive maturation of the concept

- **Exploring options with minimal impact on operations and need for additional technical integration:**
  - Goal here is to make it easy/cost-effective for FAA and for commercial vendors who will provide this capability to their customers
  - Procedural change only – use existing methods and data
  - Pilot receives “secure code” that they readback to ATC to confirm clearance
    - If at anytime the controller is not sure if the pilot has the “right” information, they can revert to normal clearance delivery procedures
    - If there are known changes to other flight plan data elements (e.g. altitude, frequency) that are not captured by the “secure code” ATC will provide these verbally to the pilot.

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Want to share how you're using SWIM data?

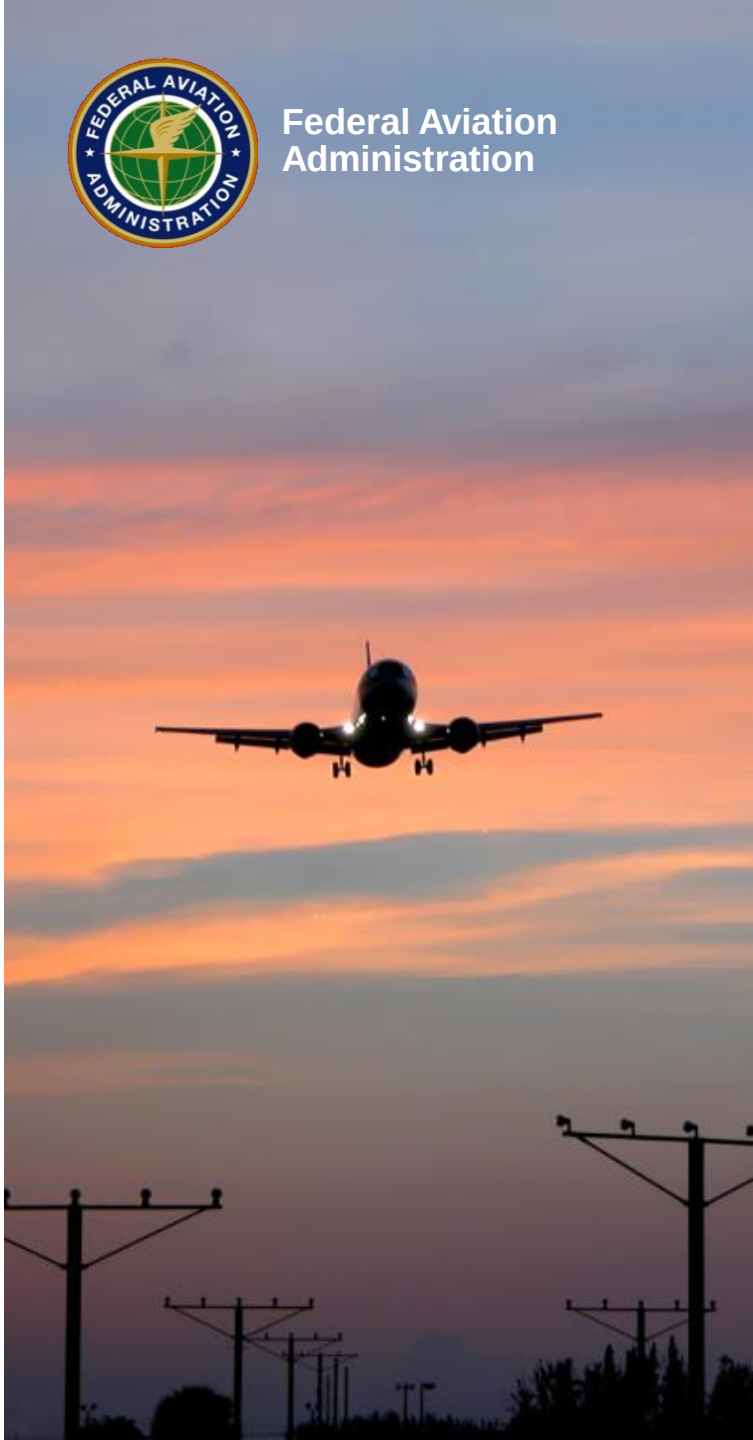
- Present at a future Users Forum
- Email swim@faa.gov and tell us about your demo

Any questions for the SWIM Program?

Type them in the “Questions” section of the toolbar

or

Use the “Raise your hand” feature



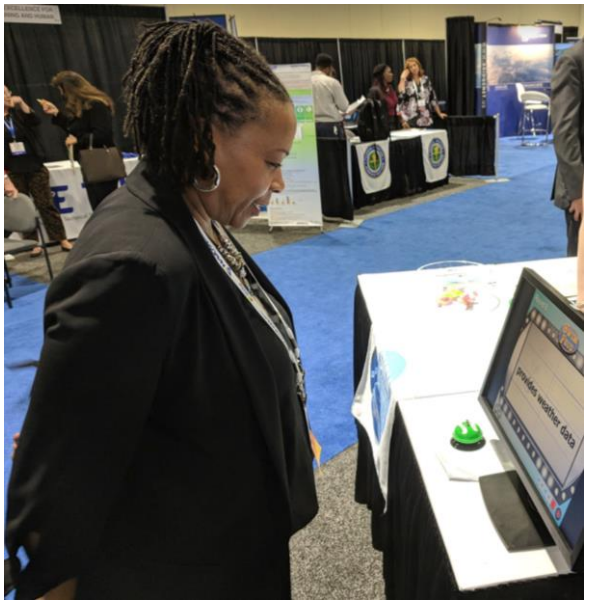
SWIM FEUD

Name a service offered by STDDS:

SMES (Surface Movement Event Service)	35
TAIS (Terminal Automation Information Service)	28
APDS (Airport Data Service)	20
TDES (Tower Departure Event Service)	12

Number of SWIM messages per day:

1.6 Trillion	35



Where can you learn more about SWIM?

SWIM Website	35	faa.gov/air_traffic/technology/swim
data.faa.gov	28	NAS Service Registry and Repository nsrr.faa.gov
Email	20	swim@faa.gov
Events	12	Next Users Forum: Dec. 13

Thank you for joining us today