

SWIFT:

FAA Industry Collaboration Workshop #14

SWIM Services & SWIFT
(SWIM Industry-FAA Team)

Presented to: User Community

By: FAA SWIM Program Communications,
Information and Network Programs

Date: May 27, 2021

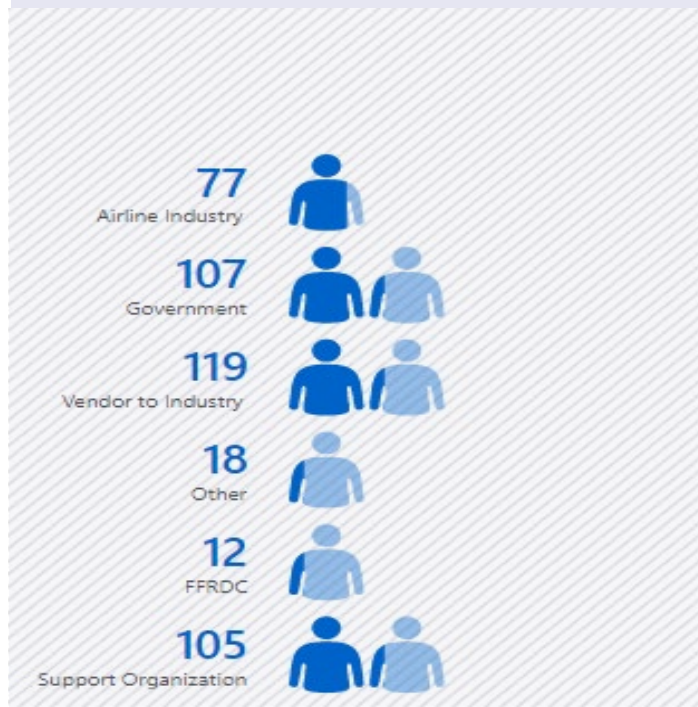


**Federal Aviation
Administration**



Who is in the “Zoom Room” at SWIFT #14?

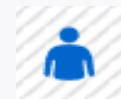
Attendee Organizations



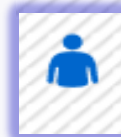
•Other defined as: Consultant, Operator, Researcher, Safety, Academia, ATM Vendor, Association, ANSP

Attended a SWIFT Meeting Before?

I'm a Veteran: 342



No, I'm New: 96



438 attendees



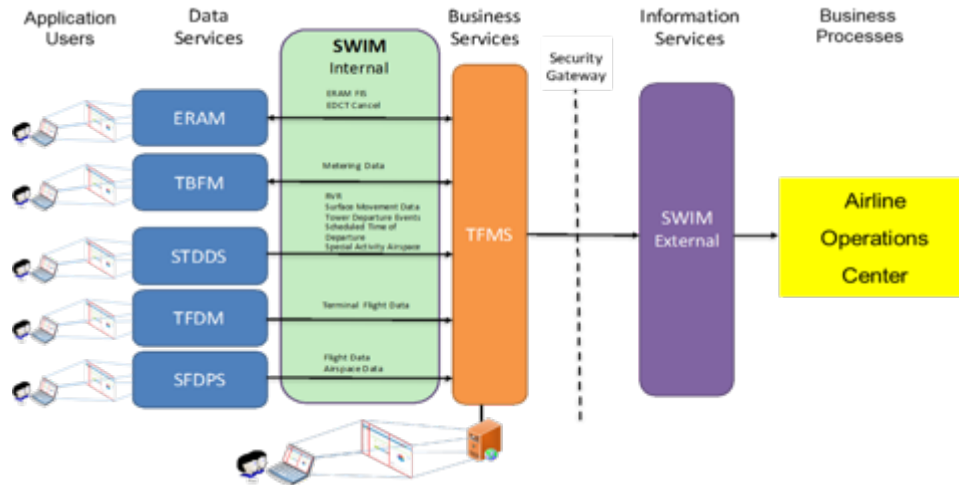
FAA Collaborative Workshop #14

- **On-line Virtual Conference Starts Promptly 12:30pm**
- **Welcome and Introductions**
 - David Almeida (LS Technologies)
 - Opening Remarks
 - Mark DeNicololo (FAA)
- **Focus Group General Updates**
 - Operational Context – Ray Mitchell (LS Technologies)
 - Operational Issues (Ops Issues) Chris Gottlieb (JetBlue)
 - Development & Analytics - Erin Cobbett (Delta) and Mike Jagmin (United)
- **Special Topic: NOTAMS Industry Update**
 - Jeri Groce (FAA)
- **NAS Program: TFDL Lab Connection**
 - Doug Swol (FAA)
- **SWIFT Update: New York Area Study On *Early Planning For Disruptions***
 - Chris Gottlieb (JetBlue) and Mark Hopkins (LS Technologies)
- **Special Topic: Trajectory Based Operations Update**
 - Steve Bradford (FAA)
- **SWIFT Portal**
 - Michael Pozsgay (FAA) and Doug Harvey (L3Harris)
- **SWIM Data: Widget Case Study Briefing**
 - Sandie Steele (LS Technologies)
- **Information Services Roadmap Update**
 - Xavier Pratt (LS Technologies)
- **Close out**



SWIFT: At the Intersection of Operations, Technology & Data

- **SWIFT addresses industry recommendation to:**
 - A community forum that acts as a clearinghouse for collaborative engagement around NAS information and data sharing
 - **Educate:** Synchronize community on information services
 - **Collaborate:** Discuss issues most relevant to community
 - **Communicate:** Inform community about SWIM & NAS programs

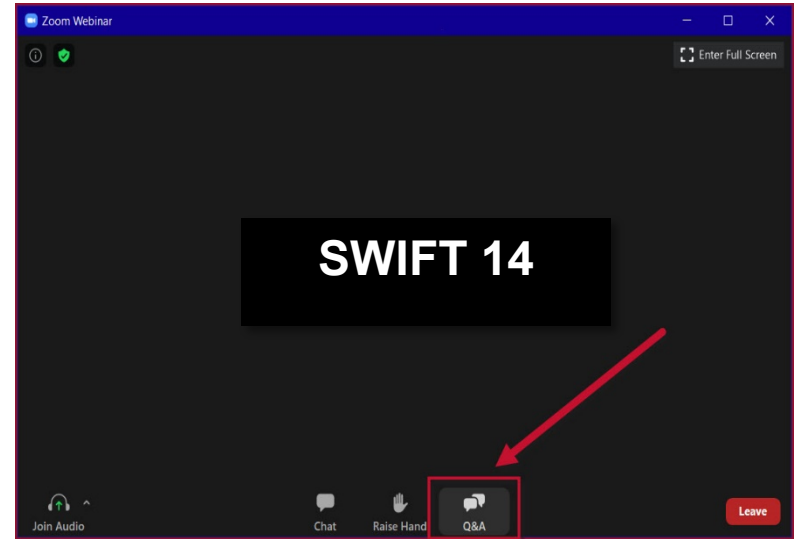


“Airwave Procedures”

- Please note during the session all attendees are muted. Use the zoom controls to the right to interact with presenters.



- To ask questions or engage during a topic of interest please use the “QA” feature. The SWIFT Team will either announce your question/comment or unmute you time permitted



SWIFT: Announcements

- **TFMS Technical Webinar: Every Second Thursday of the month @ 1PM EST**
 - Next Meeting scheduled for June 10th, 2021
 - Send questions or topics to Chris.Burdick@faa.gov



Focus Group Status Updates



Operational Context Document Focus Group

SWIFT 14 Update

Presented to: SWIFT

By: Ray Mitchell – LS
Technologies

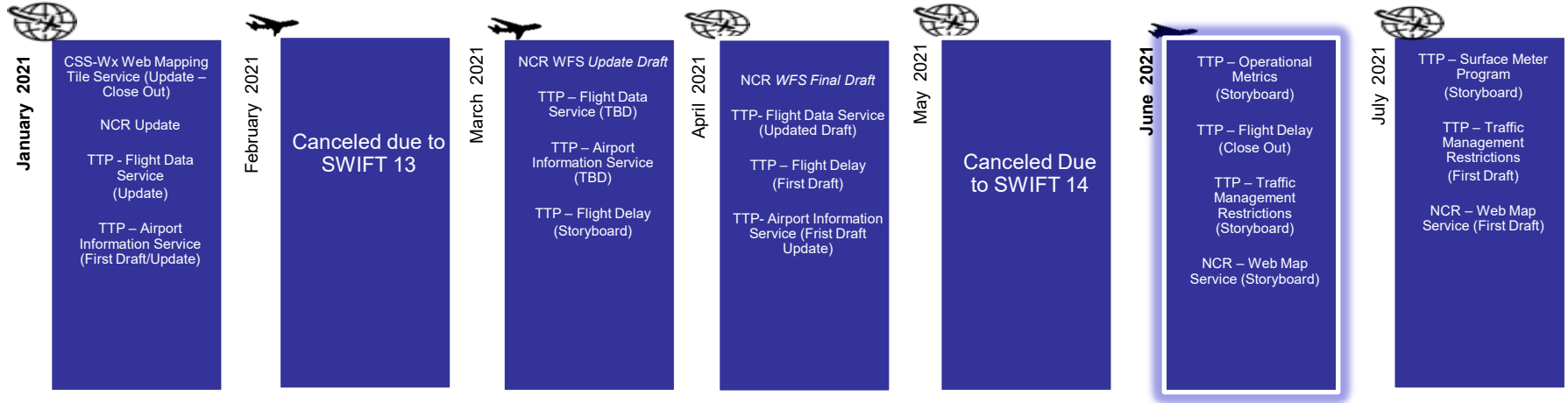
Date: May 27, 2021



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Focus Group Updates & Schedule



- **Important Notices**
 - Please submit any comments/feedback by our June 24th Session
- **Schedule Subject to Change**
- ***Interested in Joining? Please contact Ray Mitchell @ ray.mitchell@lstechllc.com***

Operational Issues Focus Group

SWIFT 14 Update

Presented to: SWIFT

By: Chris Gottlieb – JetBlue Inc.

Date: May 27, 2021



**Federal Aviation
Administration**



Ops Issues Focus Group

- **Lead:** Chris Gottlieb, JetBlue
- **Goal:** Address NAS-wide operational issues that might benefit from information sharing between organizations
- **Current Prioritized Issues:**
 - **TBFM delays (United) who, what, why it matters**
 - **Flight Planning over IP (SWA)**
 - **Early Planning for Disruptions**
 - Early Detection Deviation over Fix (JBU)
 - Early Detection for Airport Surface Delays (JBU)
 - Taxi Out Return to Gate (Delta)
 - Long taxi issues (JBU) at JFK
 - TBFM/TFMS double delays

Bolded Issues –
actively engaged

Analyzing potential linkages

Flight Planning over IP

Goal

- Align FAA Flight Plan Modernization efforts with Flight Operators' needs
 - *Understand operator systems' technical needs for Flight Planning, Filing and Data Sharing through CSS-FD*
 - *Better foresight into NAS constraints and impacts to Ops planning and decision-making*
 - *Improve service through increased reliability of operations*

Current Activities

- FAA CSS-FD Constraints Working Group (CWG) activities were initiated in January 2021 and recently concluded in March 2021. The CWG involves FAA stakeholders with various disciplines.
 - *Started list of constraints based on Radio Technical Commission for Aeronautics (RTCA) recommendations for CSS-FD (2017) and identified a total of 39 constraints relevant to pre-departure flight planning.*
 - *List was refined based on impact to pre-departure flight planning and availability in digital format*
 - *The constraints are categorized by types of constraints, e.g., traffic management, airspace constraints, etc.*
 - *In phase 1 of CSS-FD, 27 constraints, except for ATC constraints, will be provided as references, whereas ATC constraints will be provided in a form of flight plan amendment.*

Flight Planning over IP

Next Steps

- The CWG continues to perform engineering analysis on CSS-FD requirements constraints identified and evaluate different approaches.
- Next CWG and OIFG collaboration meeting is currently is TBD
- A Market Survey/RFI for the CSS-FD program was issued on 14 April 2021
 - The primary purpose of this RFI announcement is to gain a better understanding of Industry capabilities and obtain feedback on initial program documents in order to meet the program objectives. Responses to the RFI must be submitted NLT 28 May 2021 at 4:00pm EST. Link to CSS-FD Request For Information (RFI):
https://beta.sam.gov/opp/9d4c748bd0f8404f82886ac8886d8790/view?keywords=CSS-FD&sort=-relevance&index=opp&is_active=true&page=1to
- Next month, an industry announcement will be posted to beta.sam.gov that will have more details about the CSS-FD Risk Reduction Activity and a deadline for when interested parties can express their interest.

Want your Ops Issues to be heard?? Join us!

For more information:

- Join the **SWIM Flight Planning Modernization** Teams Group page for updates and continued dialogue

OR...

Contact Us:

- Chris Gottlieb – Christopher.Gottlieb@jetblue.com
- Xavier Pratt- Xavier.Pratt@lstechllc.com

Development & Analytics Focus Group (DAFG)

SWIFT 14 Update

Presented to: SWIFT

By: Erin Cobbett – Delta &
Mike Jagmin – United Airlines

Date: May 27, 2021



**Federal Aviation
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Development & Analytics Focus Group

Leads: Erin Cobbett, and Mike Jagmin – Delta & United

Background & Purpose Recap:

- Collaborate with Operational Issues Focus Group
- Leverage the expertise of participants to present solutions using SWIM data
- Identify top community priorities via SWIFT meetings and by the Operational Focus Group

Status:

- Sprint 2 Closeout Resolution Discovery Continues
- SWIM ETA Full Timeline – On Hold

TBFM Delays Sub Team Sprint 2

Goal remains the same – determine the departure delay given to a flight by TBFM

- Delay should be the difference between aircraft ready time and the scheduled departure time
- CTM / ETD fields initially set as ready time, but can be updated for many reasons, not transparent to the end SWIM user

Current Activities & Status

- Efforts continue with Bi-weekly Meetings to achieve longer term solution
- TBFM team captured 5 issues/enhancement areas on MIS. As the weeks continued this collaborative effort has produced a priority ranking that both the TBFM & Airline Team vetted, along with options for placement in the deployment roll-out schedule. Those efforts will continue to allow each group to more closely examine the proposed solutions to ensure they improve operations.



SWIM ETA Full Timeline

Problem Statement:

- Airlines lack the ability to easily see downstream impacts on the NAS from their modifications to the ETA (and other data points) submitted to the FAA. Currently this leads to ambiguity between input and output data, and no insight into the full impact on ETA. Aggregating and analyzing a full set of inputs and outputs from the FAA systems will provide a better understanding of how these changes impact flights, as well as foster change to benefit the industry as a whole.

Status:

- On hold, team will re-evaluate future plans for this initiative at the next DAFG Meeting

Now that we have your attention.... Join us!

Next full DAFG scheduled for June 17th @1pm EST

- Provide out brief on Sprint 2 Resolution Discovery
- Provide out brief on SWIM ETA
- Provide general status of focus group
- Last call: Identify any additional issues industry is looking to working

Contact Us:

Erin Cobbett – Erin.Cobbett@delta.com

Mike Jagmin - Michael.Jagmin@united.com

Ray Mitchell - Ray.Mitchell@lstechllc.com

Remaining DAFG Initiatives – What's the Next Priority

- Double delays
- Gate Returns
- NE SWAP Routing issues
- FFICE
- Demand over an Entity
- Estimated Times



NOTAM System Modernization

NOTAM Application Programming Interface (API)

Presented to: SWIFT

By: Jeri Groce – FAA

Date: May 27, 2021



**Federal Aviation
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NOTAM API Challenge



Motivation – Industry feedback for:

“a simplified machine-to-machine interface to help improve access to NOTAM data”



FAA and NASA collaborated to conduct an industry challenge to develop NOTAM API's

What is the NOTAM API “Challenge”?

- Innovative software development approach that involves developers across the industry and across the globe
- 21 individual solution building challenges were launched for industry response
- Challenge deliverables were integrated to deliver final NOTAM API product in Spring 2021
- Collaboration with NASA enabled the FAA to leverage industry talent and accelerate delivery of the solution industry requested



NOTAM Application Programming Interface (API)

What is the NOTAM API?

- Machine-to-machine interface providing NOTAM query and filter capability
- Standards based: OpenAPI specification compliant with REST service endpoints
- NOTAM API portal for developer registration and API key management
- NOTAM API currently in prototype phase
- Non-operational use

How is the NOTAM API different from other FAA NOTAM sources?

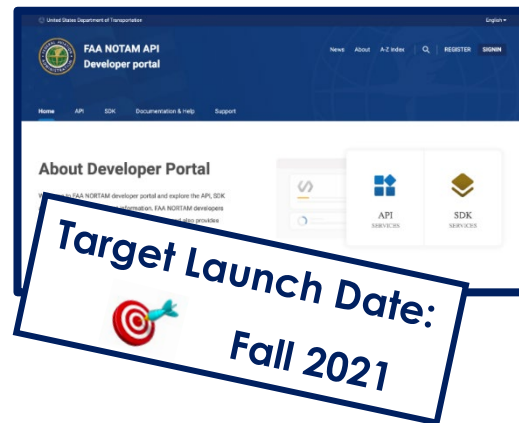
- Quick onboarding and access, to include API documentation
- Multiple output formats to cater to different user needs
- Enables direct NOTAM query (doesn't require end system to store all NOTAMs)

Who is the target audience for the NOTAM API?

- System / application developers

When will it be available?

- Target launch in Fall 2021
- Agency communications outreach planned



Benefits of NOTAM API

Quick and Easy access

- Register online and get access to service end-points, keys, documentation, and development kit

Simplicity & Easy Integration

- REST API following Industry standard OpenAPI specification
- Both human and machine-readable documentation

Query Interface with Filtering & Sorting capability

- Eliminates the need to maintain a separate database
- Get relevant NOTAMs leveraging filtering capability
 - example: Get Runway NOTAMs at an Airport

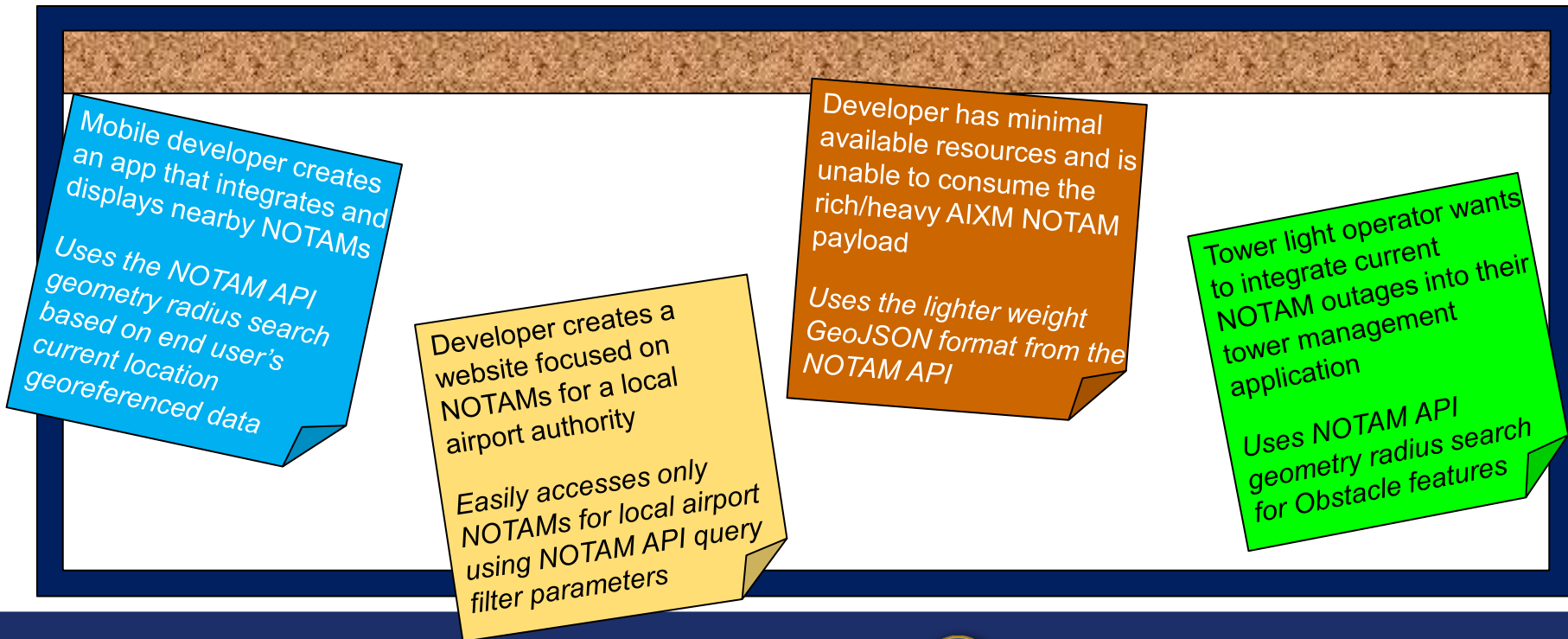
In three formats meeting different stakeholder needs

All NOTAM and available Geometry data from a single source

- Integrates NOTAMs from FNS with published Temporary Flight Restriction (TFR) and Special Activity Airspace (SAA) geometries (where available)
- Enables graphical visualization

Use Cases for NOTAM API

How might end users take advantage of the NOTAM API? The options are endless...



NOTAM API Concept

Receives NOTAMs from the Federal NOTAM System (FNS) (authoritative source)

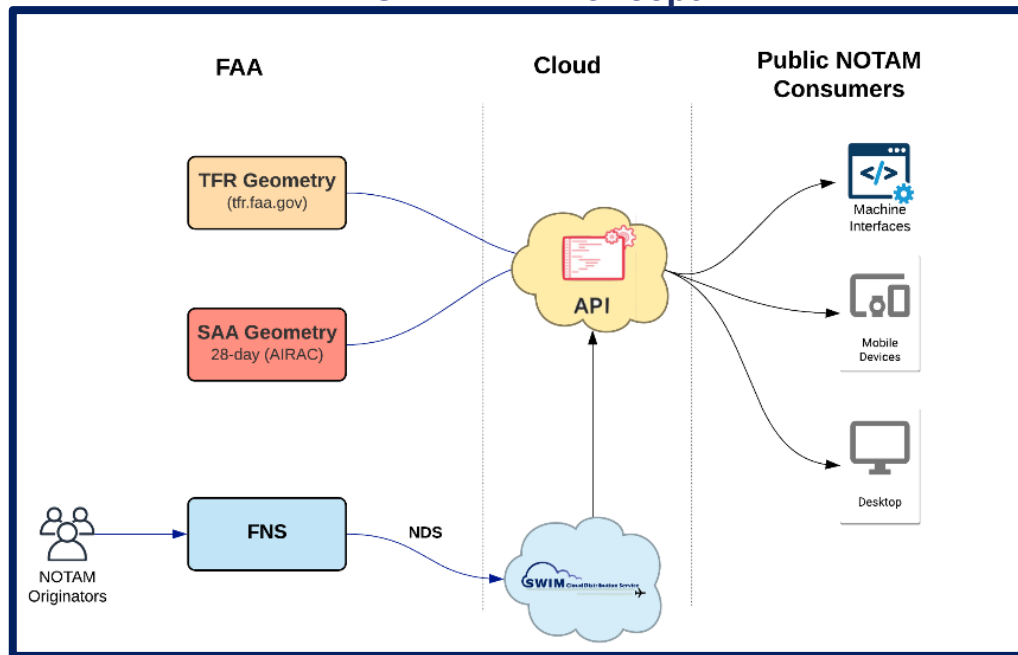
- NOTAM Distribution Service (Pub/Sub) over SWIM Cloud Distribution Service (SCDS)

Integrates with additional & relevant geometry information

- TFR and SAA sources

Provides integrated NOTAM data through API deployed as a cloud native application

NOTAM API Concept

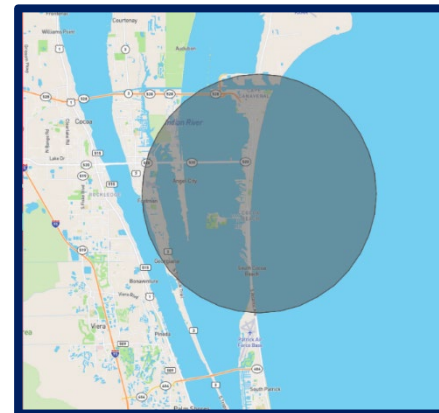


TFR and SAA Geometry Integration

!FDC 1/3831 ZMA FL..AIRSPACE COCOA BEACH, FL..TEMPORARY FLIGHT RESTRICTION. PURSUANT TO 14 CFR SECTION 91.145, MANAGEMENT OF ACFT OPS IN THE VCY OF AERIAL DEMONSTRATIONS AND MAJOR SPORTING EVENTS, ACFT OPS ARE PROHIBITED WI AN AREA DEFINED AS 5NM RADIUS OF 282008N0803602W (MLB015013.9) SFC-15000FT UNLESS AUTHORIZED BY ATC. EFFECTIVE 2104161430 UTC UNTIL 2104161930 UTC, 2104171530 UTC UNTIL 2104171930 UTC, AND 2104181530 UTC UNTIL 2104181930 UTC. DUE TO COCOA BEACH AIR SHOW AERIAL DEMONSTRATIONS. WAYNE BOGGS, TEL 813-340-5623, IS THE AIRSHOW POINT OF CONTACT. PATRICK /COF/ ATCT, TEL 321-494-0355, IS THE ATC CDN FACILITY. 2104161430-2104181930



TFR NOTAM

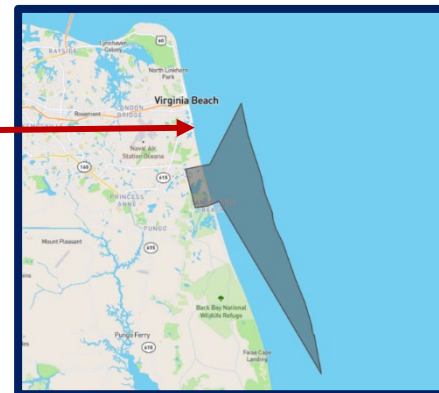


!SUAE 04/894 ZDC AIRSPACE **R6606** ACT SFC-FL230
2104122101-2104131159

SAA Identifier



SAA NOTAM



NOTAM API: Formats

NOTAMs can be requested in the three formats

AIXM 5.1

unmodified from FNS-NDS

```
</ns3:time@100>
</ns5:validTime>
<ns9:interpretation>BASELINE</ns9:interpretation>
<ns11:scenario>39</ns11:scenario>
<ns11:textNOTAM>
  <ns11:NOTAM ns5:id="NOTAM_1_60194836">
    <ns11:number>115</ns11:number>
    <ns11:year>2021</ns11:year>
    <ns11:type>N</ns11:type>
    <ns11:issued>2021-04-07T20:26:00.000Z</ns11:issued>
    <ns11:affectedFIR>ZNY</ns11:affectedFIR>
    <ns11:minimumFL>000</ns11:minimumFL>
    <ns11:maximumFL>999</ns11:maximumFL>
    <ns11:radius>5</ns11:radius>
    <ns11:location>JFK</ns11:location>
    <ns11:effectiveStart>202104072026</ns11:effectiveStart>
    <ns11:effectiveEnd>202112312300</ns11:effectiveEnd>
    <ns11:text>TMY E HLDG PSN SIGN FOR RWY 13L/31R MISSING</ns11:text>
    <ns11:translation>
      <ns11:NOTAMTranslation ns5:id="NT01_60194836">
        <ns11:type>LOCAL_FORMAT</ns11:type>
        <ns11:simpleText>JFK 04/115 JFK TMY E HLDG PSN SIGN FOR RWY 13L/31R MISSING
          2104072026-2112312300</ns11:simpleText>
      </ns11:NOTAMTranslation>
    </ns11:translation>
  </ns11:NOTAM>
</ns11:translation>
```

AIDAP

legacy – supports system transition
from older NOTAM feed

```
<items>
  <notam-query-result-set>
    <start-time>
    <usns-lastmod-dtg>
    <query-type>
    <query-parameter>
    <notam-rec>
      <source_id></source_id>
      <account_id>JFK</account_id>
      <notam_id>04/115</notam_id>
      <notam_part>1</notam_part>
      <cms_location_id></cms_location_id>
      <icao_id>KJFK</icao_id>
      <icao_name>JOHN F KENNEDY INTL</icao_name>
      <total_parts>1</total_parts>
      <notam_effective_dtg>202104072026</notam_effective_dtg>
      <notam_expire_dtg>202112312300</notam_expire_dtg>
      <notam_delete_dtg>
      <notam_lastmod_dtg>2021-04-07T20:26:00.000Z</notam_lastmod_dtg>
      <notam_text>JFK 04/115 JFK TMY E HLDG PSN SIGN FOR RWY 13L/31R MISSING</notam_text>
      <notam_report>
      <notam_altkey>JFK_D_JFK_04_115_1</notam_altkey>
      <artcc_id>ZNY</artcc_id>
      <notam_origin_dtg>
      <create_dtg>2021-04-07T20:26:00.000Z</create_dtg>
      <notam_a>JFK</notam_a>
```

GeoJSON

condensed compared to AIXM,
including additional geometry

```
{
  "type": "Feature",
  "properties": {
    "coreNOTAMData": {
      "notamEvent": {
        "scenario": "39"
      },
      "notam": {
        "id": "NOTAM_1_60194836",
        "number": "04/115",
        "type": "N",
        "issued": "2021-04-07T20:26:00.000Z",
        "affectedFIR": "ZNY",
        "minimumFL": "000",
        "maximumFL": "999",
        "location": "JFK",
        "effectiveStart": "2021-04-07T20:26:00.000Z",
        "effectiveEnd": "2021-12-31T23:00:00.000Z",
        "text": "TMY E HLDG PSN SIGN FOR RWY 13L/31R MISSING",
        "classification": "DOM",
        "accountID": "JFK",
        "lastUpdated": "2021-04-07T20:26:00.000Z",
        "icaoLocation": "KJFK",
        "coordinates": "403807346W",
        "radius": "5"
      }
    }
  }
}
```

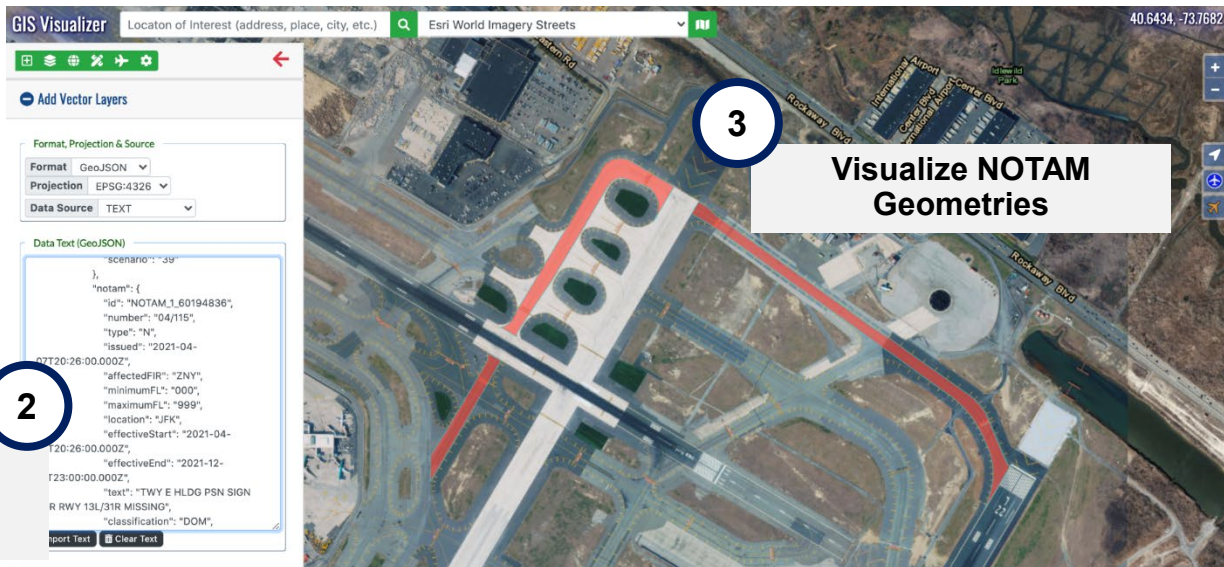
NOTAM API: Enables Easy Visualization

Query NOTAM API for GeoJSON formatted NOTAM

1

```
{
  "type": "Feature",
  "properties": {
    "id": "NOTAM.1.60194836",
    "number": "04/115",
    "type": "N",
    "issued": "2021-04-07T20:26:00.000Z",
    "affectedFIR": "ZNY",
    "minimumFL": "000",
    "maximumFL": "999",
    "location": "JFK",
    "effectiveStart": "2021-04-07T20:26:00.000Z",
    "effectiveEnd": "2021-12-31T23:00:00.000Z",
    "text": "TWY E HLDG PSN SIGN FOR RWY 13L/31R MISSING",
    "classification": "DOM",
    "accountId": "JFK",
    "lastUpdated": "2021-04-07T20:26:00.000Z",
    "iconLocation": "KJFK",
    "coordinates": "403807366N",
    "radius": "50"
  },
  "geometry": {
    "type": "Point",
    "coordinates": [
      -73.7682,
      40.6434
    ]
  }
}
```

Integrate into simple
open tools/apps to
visualize



Simple example – Developers can easily use the NOTAM API to programmatically bring NOTAM data and geometries into their custom applications.

NOTAM API: Query Parameters



NOTAM API supports a range of Query/Filter parameters to better deliver the specific NOTAMs of interest to the user

- Enables delivery of refined NOTAM results to end application users
- Supports requests for improved NOTAM filtering abilities from the industry

NOTAM API Query/Filter Parameters

- Location (Domestic or ICAO identifier)
- NOTAM Type/Classification
 - 5 types: domestic (DOM), FDC, Military (MIL, LMIL) and International (INTL)
- Location and NOTAM Number
- Effective start and end dates
- Affected feature types (example: Runway, Taxiway)
- Geometry search (Location coordinates and a radius in NM)
- NOTAMs from a date (last update date)

NOTAM API: Open API Specification

Interactive Swagger implementation supports developer familiarization with NOTAM API – with no code development

API Swagger

Need Help [Learn more](#)

FAA NOTAM: Notice to Airmen NOTAM Search API

[View](#) [Edit](#)

/assets/data/swagger.json

REST API for the FAA NOTAM: Notice to Airmen NOTAM Search

General Info:

First, an API key should be requested by a registered user of the FAA NOTAM API via the developer portal. Then, the API key should be included in the **X-API-KEY** header which will be validated against the NOTAM API database. If the API key is invalid, not found, or expired, the API will return a 401 Status Code with corresponding error message.

Once a registered user has validated their API key for the NOTAM API, they can add parameters to their NOTAM API queries. The criteria provided for each parameter will be validated. If any of the below rules is not met, the NOTAM API will return 400 status code with appropriate error message.

- **notamNumber** has to be used along with a location filter (**icaoLocation**/**domesticLocation** criteria); using just the **notamNumber** filter is not allowed.
- **locationLongitude**, **locationLatitude**, and **locationRadius** should either all be provided together, or none should be provided. **locationRadius** is capped at 100 nautical miles max.
- **lastUpdatedDate** When a **lastUpdatedDate** parameter is specified, the Expired and Cancelled NOTAMs will be returned by the API. An Expired NOTAM is when the **effectiveEndDate** is less than the current time. A Cancelled NOTAM is when the NOTAM has been updated to a 'Cancelled' status. If the **lastUpdatedDate** is not specified, only Active NOTAMs will be returned (e.g. all Expired and Cancelled NOTAMs will be excluded from the API search result).
- **effectiveStartDate** and **effectiveEndDate** should either all be provided together, or none should be provided.
- **sortBy** should only have allowed sort by values (or null to sort by default **startTime** field). List of allowed **sortBy** fields are **icaoLocation**, **domesticLocation**, **notamType**, **notamNumber**, **effectiveStartDate**, **effectiveEndDate**, **featureType**.
- **sortOrder** should only have allowed sort order values (or null to sort by default **Desc** order). List of allowed **sortOrder** values are **Asc** and **Desc**.
- **pageSize** should be positive integer (or null).
- **pageNumber** should be positive integer (or null).

Open API Specification -
standard/language-
agnostic interface
documentation provided to
developers

GET /notams/geoJson

Fetching NOTAM data in GeoJSON format

Parameters

Name	Description
icaoLocation string (query)	The icao location criteria. (ex. KIAD for Dulles International Airport)
domesticLocation string (query)	The domestic location criteria. (ex. IAD for Dulles International Airport)
notamType string (query)	The NOTAM type criteria. The NOTAM type is 'N' for a 'New' NOTAM, 'R' for a 'Replaced' NOTAM, or 'C' for a 'Cancelled' NOTAM
classification string (query)	The NOTAM classification criteria.
notamNumber string (query)	The NOTAM number criteria. (ex. CK00)
effectiveStartDate	

Execute Clear

Responses

Out

```
curl -X GET \
  https://localhost:8080/api/v1/notams/geoJson?domesticLocation=JFK&locationRadius=100&sortBy=effectiveStartDate&pageSize=100&pageNumber=1 \
  -H 'accept: application/json' \
  -H 'X-API-KEY: <your api key>'
```

Request URL

```
https://localhost:8080/api/v1/notams/geoJson?domesticLocation=JFK&locationRadius=100&sortBy=effectiveStartDate&pageSize=100&pageNumber=1
```

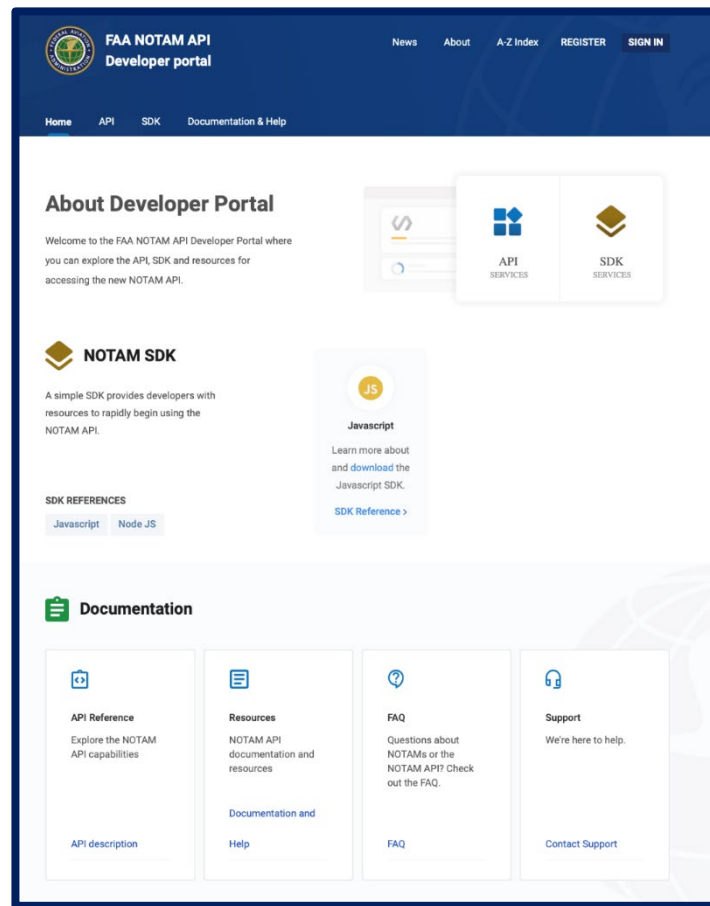
Server response

Enter desired
parameters and
see code
examples

NOTAM API: Developer Portal

NOTAM API Developer Portal provides users with ready access to development resources

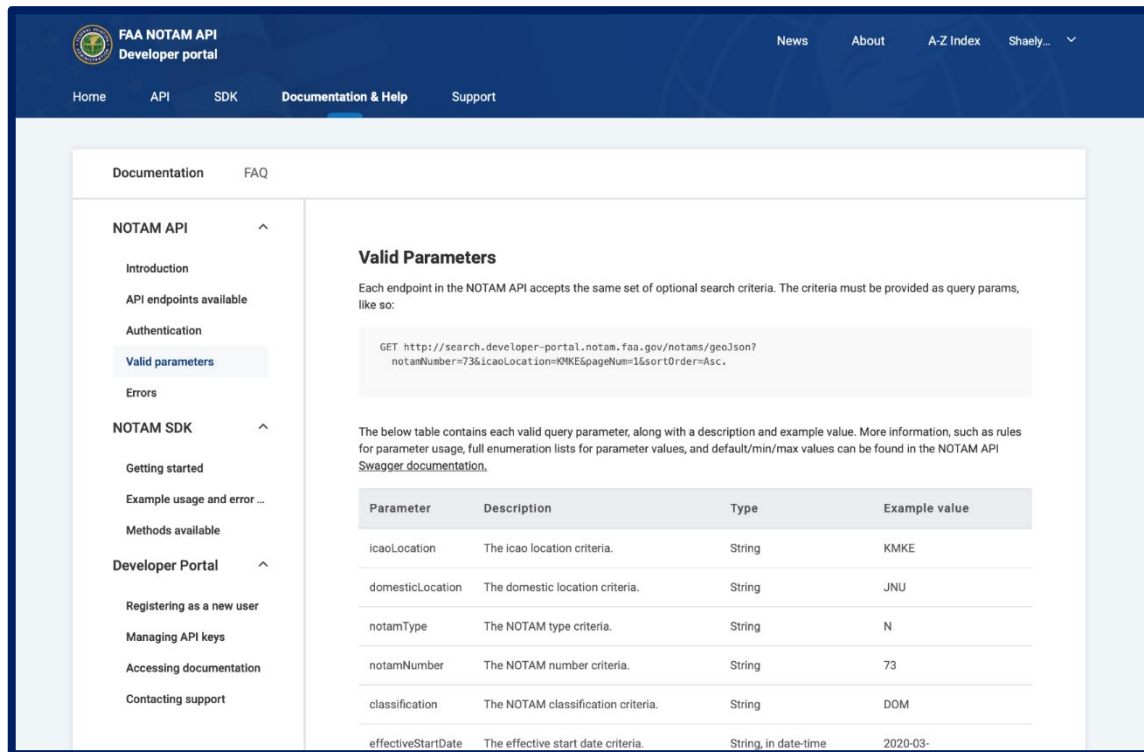
- Simple registration and user approval process
- NOTAM API documentation – based on Open API Specification (OAS)
- API Access Key generation and management
- Software Development Kit (SDK) in JavaScript
- Support link



NOTAM API: Documentation

Comprehensive NOTAM API documentation

- Registration and Access Key Management
- NOTAM API endpoints, parameters, and errors
- NOTAM SDK Examples



The screenshot shows the FAA NOTAM API Developer portal. The header includes the FAA logo, the text "FAA NOTAM API Developer portal", and navigation links: News, About, A-Z Index, and Shaely... A secondary navigation bar contains links for Home, API, SDK, Documentation & Help (which is highlighted), and Support.

The main content area is titled "Documentation" and "FAQ". On the left is a sidebar menu with the following items: NOTAM API (expanded), Introduction, API endpoints available, Authentication, Valid parameters (highlighted), Errors, NOTAM SDK (expanded), Getting started, Example usage and error ..., Methods available, Developer Portal (expanded), Registering as a new user, Managing API keys, Accessing documentation, and Contacting support.

The main content area displays the "Valid Parameters" section. It states: "Each endpoint in the NOTAM API accepts the same set of optional search criteria. The criteria must be provided as query params, like so:" followed by a code block showing a GET request to the search endpoint with query parameters for notamNumber, icaoLocation, KMKE, pageNum, and sortOrder.

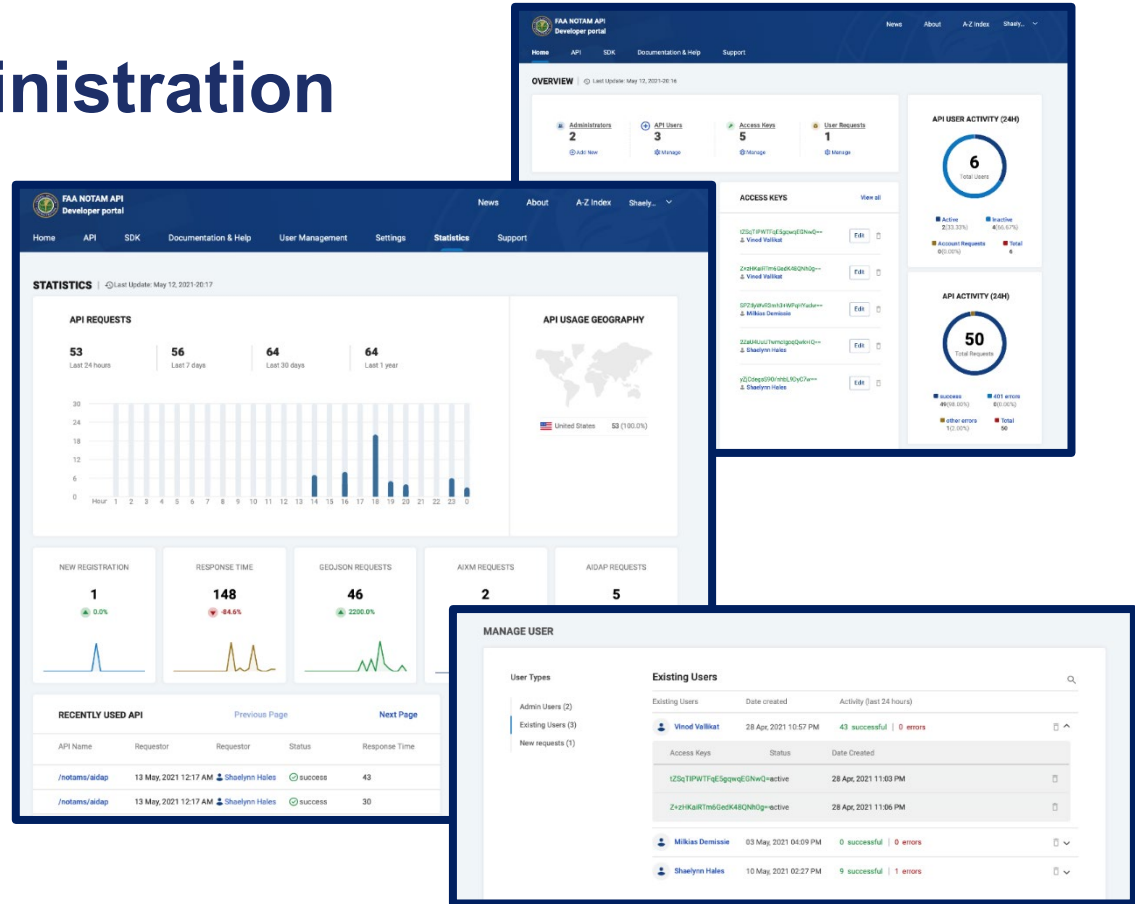
Below this, a paragraph explains that the table contains valid query parameters with descriptions and example values, and refers to Swagger documentation for more details.

Parameter	Description	Type	Example value
icaoLocation	The icao location criteria.	String	KMKE
domesticLocation	The domestic location criteria.	String	JNU
notamType	The NOTAM type criteria.	String	N
notamNumber	The NOTAM number criteria.	String	73
classification	The NOTAM classification criteria.	String	DOM
effectiveStartDate	The effective start date criteria.	String, in date-time	2020-03-

NOTAM API: Administration

Easy access to NOTAM API administration and usage statistics

- Easy dashboard navigation
- User management
- Access Key management
- API activity statistics



NOTAM API: What's Next

How can you get access?

- Currently, prototype accessible to AIS Coalition only
- Target availability for wider use in Fall 2021
- Stay tuned to FAA communications
 - <https://www.faa.gov/about/initiatives/notam/>



TFDM Testbed

Flight Operator System (FOS) Testbed

Presented to: SWIFT

By: Doug Swol – FAA
TFDM Deputy PM

Date: May 27, 2021



**Federal Aviation
Administration**



Electronic Flight Data	Collaborative Decision Making on the Surface
Traffic Flow Management	Systems Consolidation

TFDM

Two Configurations

-
- LEGEND**
- ✦ Configuration A (27 sites)
 - ✧ Configuration B (62 sites)
- LEGEND**
- PSS Complete
 - SS Complete
 - HW Install Complete
 - SAT Complete
 - CAI Complete
- The map displays the United States with various airports marked. Configuration A sites are indicated by star symbols, and Configuration B sites are indicated by diamond symbols. The completion status for each site is color-coded: PSS Complete (blue), SS Complete (purple), HW Install Complete (green), SAT Complete (light blue), and CAI Complete (orange). Key airports shown include SEA, PDX, BOI, BIL, MSP, ORD x 3, DTW, CLE, CMH, DAY, IND, FWA, MDW, STL, SFO, OAK, SJC, LAS, SLC, DEN, LAX, PHX, PRC, DVT, SDL, IWA, PMA, DFW x 3, DAL, SAT, IAH, HOU, CRP, MEM, BNA, TYS, LIT, FSM, GPT, BHM, ATL, SAV, JAX, DAB, TPA, MCO, PBI, FTX, MIA, FLL, DCA, IAD, BWI, ORF, ADW, BOS, PVD, BDL, LGA, JFK, EWR, and PHL. The map also shows Alaska (ANC) and Hawaii (HNL).

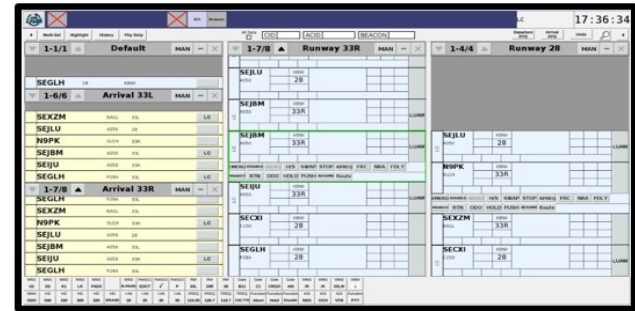
SWIFT 14 May 27th 2021

Progress During COVID

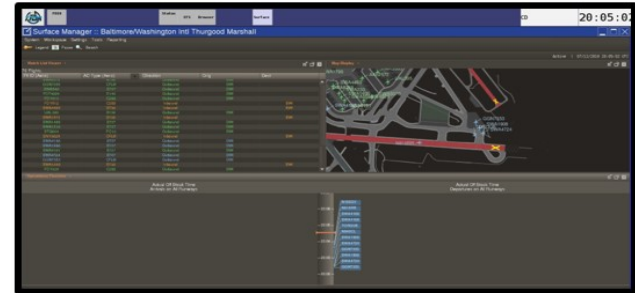
TFDM Progress to Date:

- Developed remote TFDM lab access for developmental testing of the TFDM software
- Completed Build 1 software updates and completed most Build 1 developmental testing
- Completed Build 2 preliminary software development
- Completed TFDM testbed for early industry connection to TFDM

Build 1: Electronic Flight Data



Build 2: Surface Management



TFDM Recovery Plan

– TFDM Build 1

- **Key Site:** Phoenix Sky Harbor International Airport (PHX)
- **Pre-COVID IOC Date:** June 2020
- **New Projected* IOC Date:** May 2022

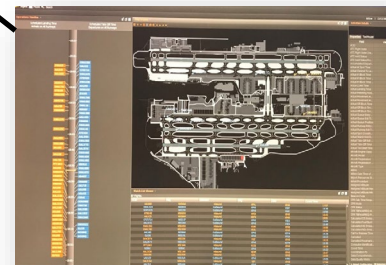
– TFDM Build 2

- **Key Site:** Charlotte-Douglas International Airport (CLT)
- **Pre COVID IOC Date:** November 2021
- **New Projected* IOC Date:** May 2023

– New TFDM Deployment Waterfall available in Fall 2021



Build 1: Electronic Flight Data



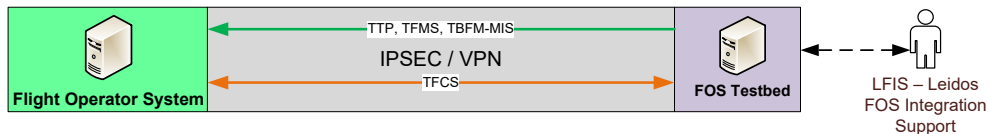
Build 2: Surface Management Tools

* Pending full access to FAA facilities, travel, and dependencies on other FAA programs

TFDM Testbed Introduction

- **TFDM developed laboratory testbed to allow industry to connect to TFDM before TFDM is deployed operationally**
- **Allows testing of both TFDM Terminal Publication (TTP) and TFDM FOS Collaboration Service (TFCS)**
- **Objectives:**
 - Understand the data elements produced/consumed by TFDM
 - Understand TFDM's messaging structure
 - Modify/change industry tools to utilize TFDM data
- **Utilizes canned scenario data initially**
 - Planning to utilize SCDS to offer more real-time testing in the future

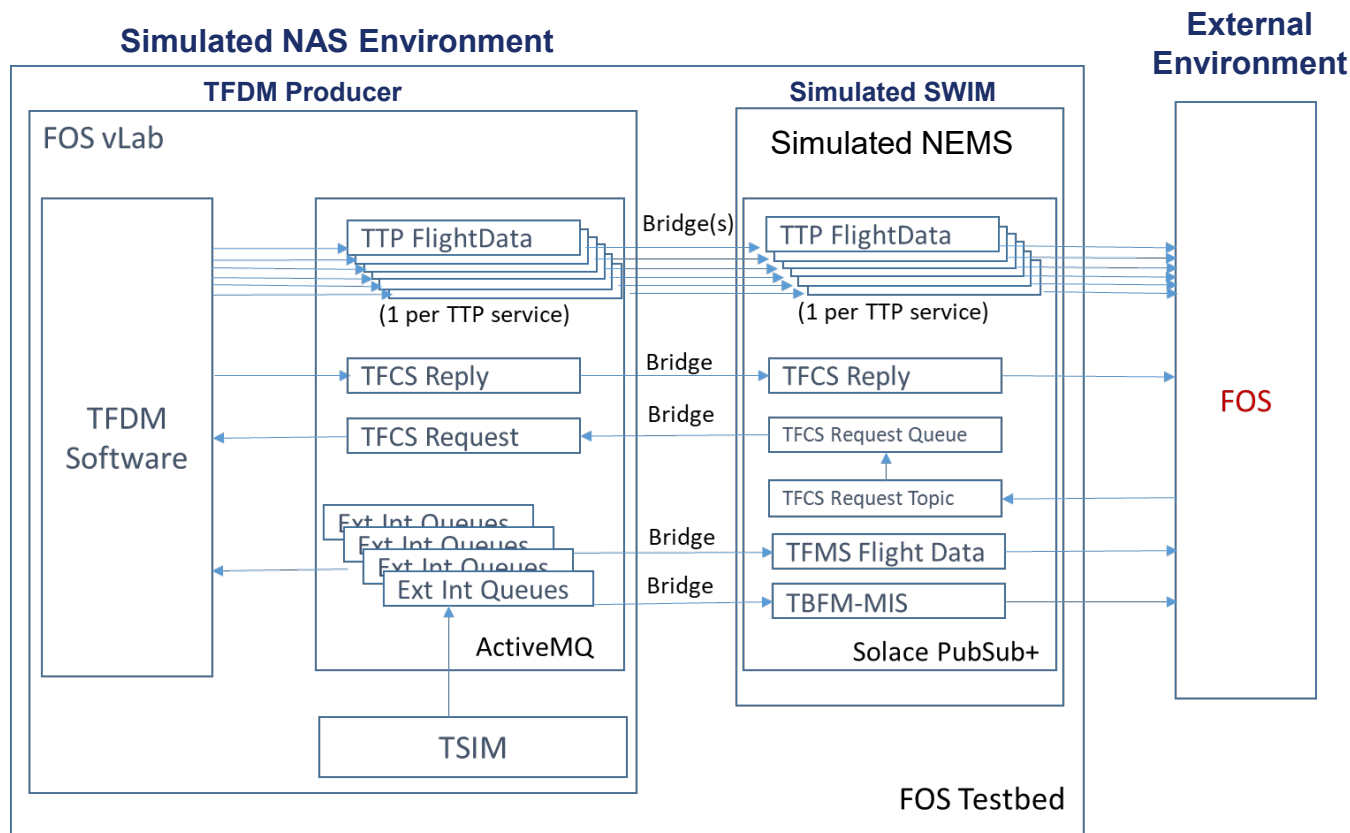
FOS Testbed Environment



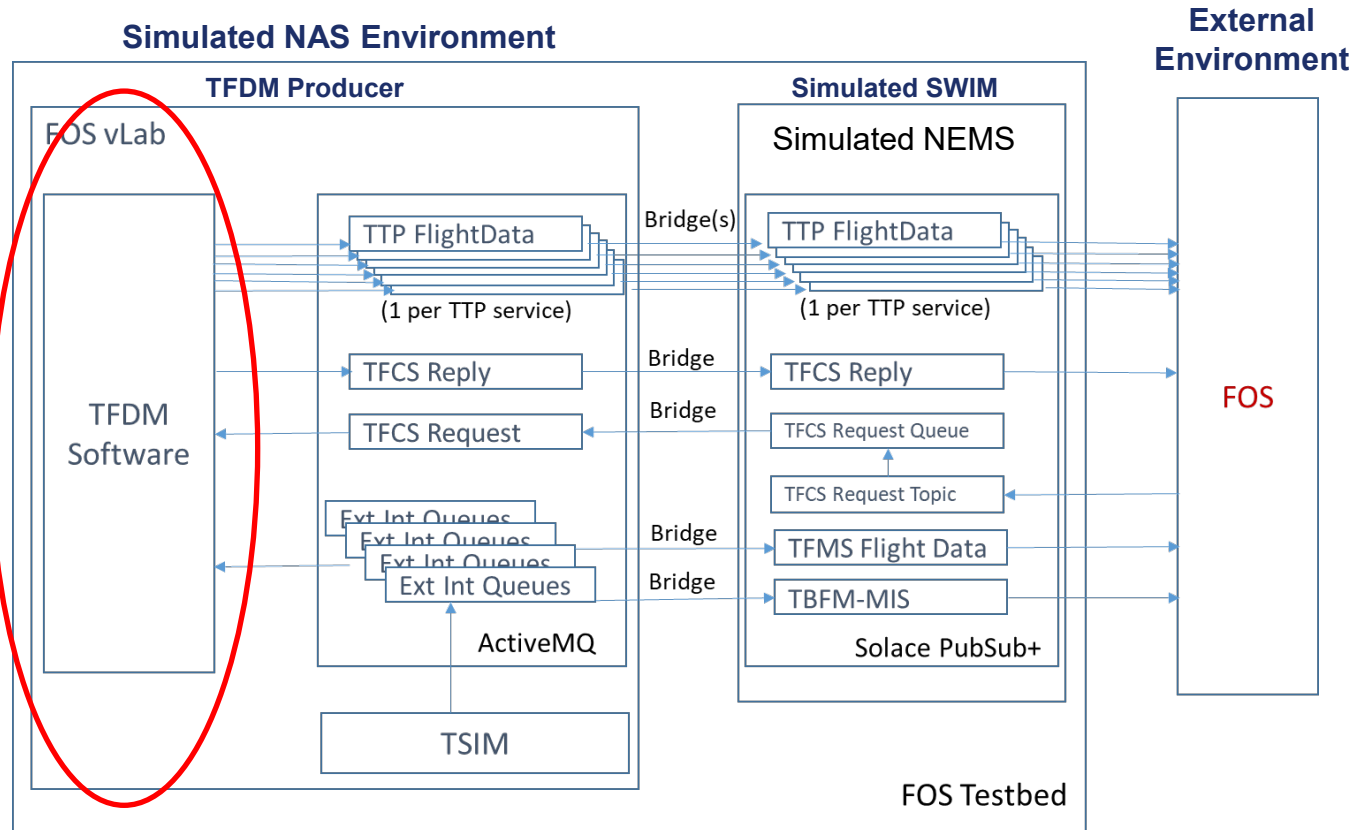
Testbed Details

- TFDm Software Build 2.1
- Adapted as CLT
- Replay of messages from 2/19/2020

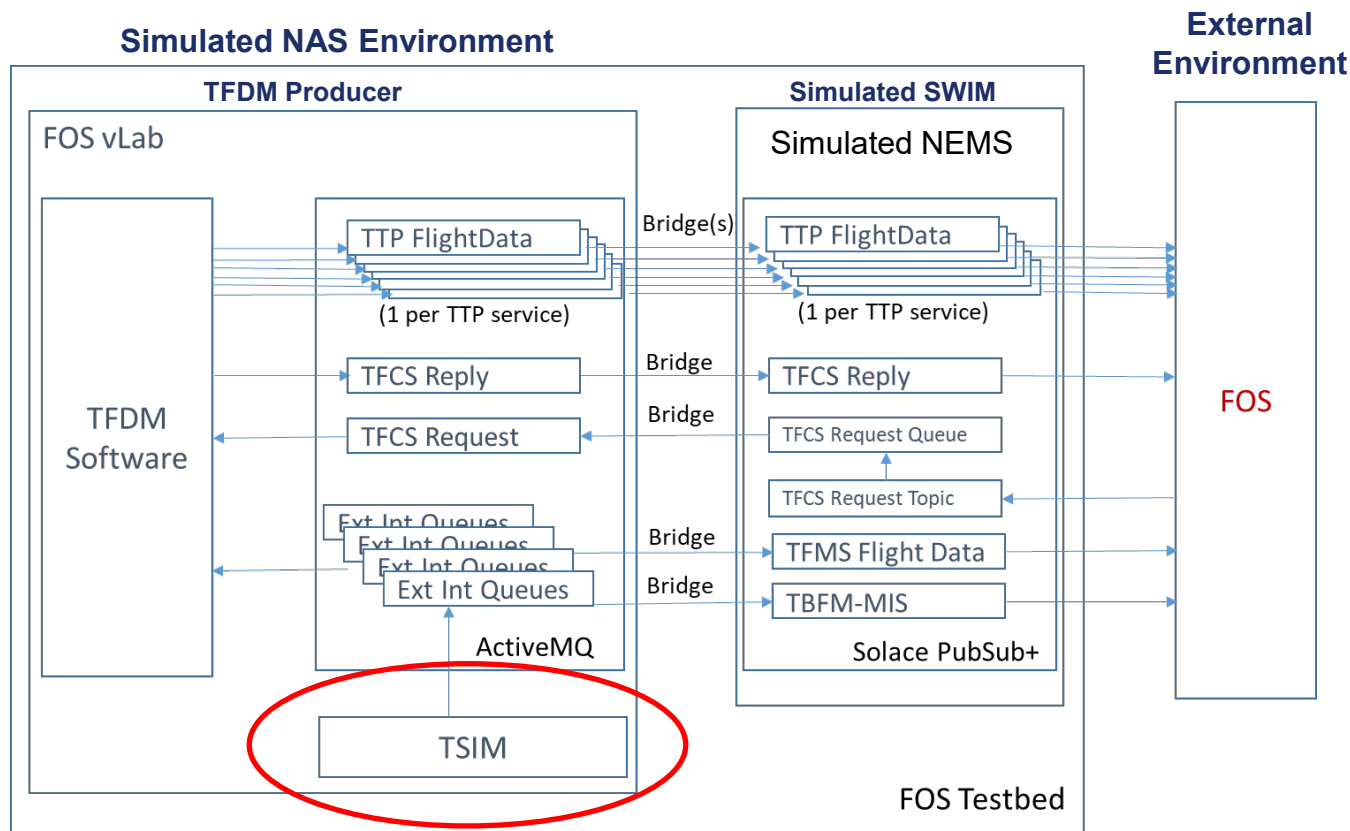
Testbed - Message Routing



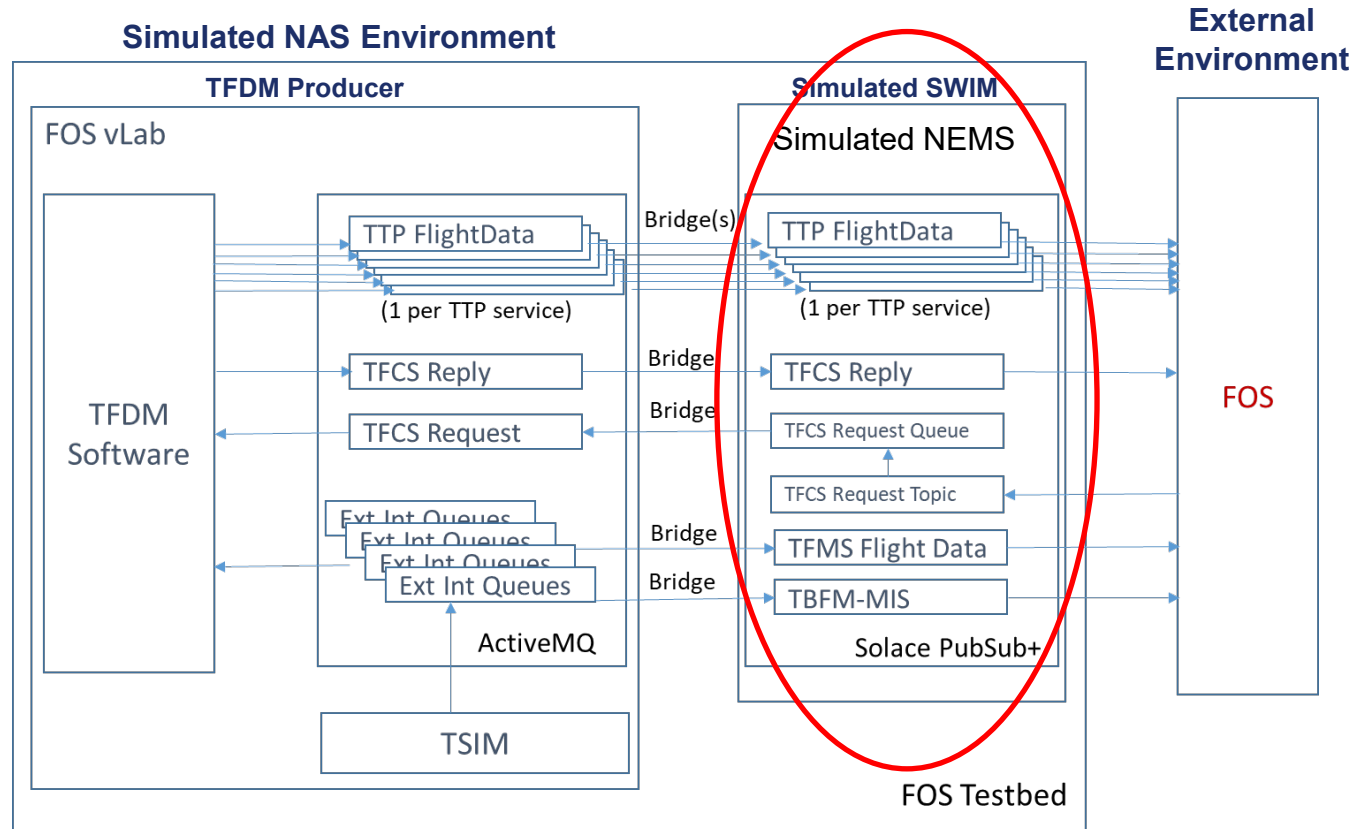
Testbed – TFDM system



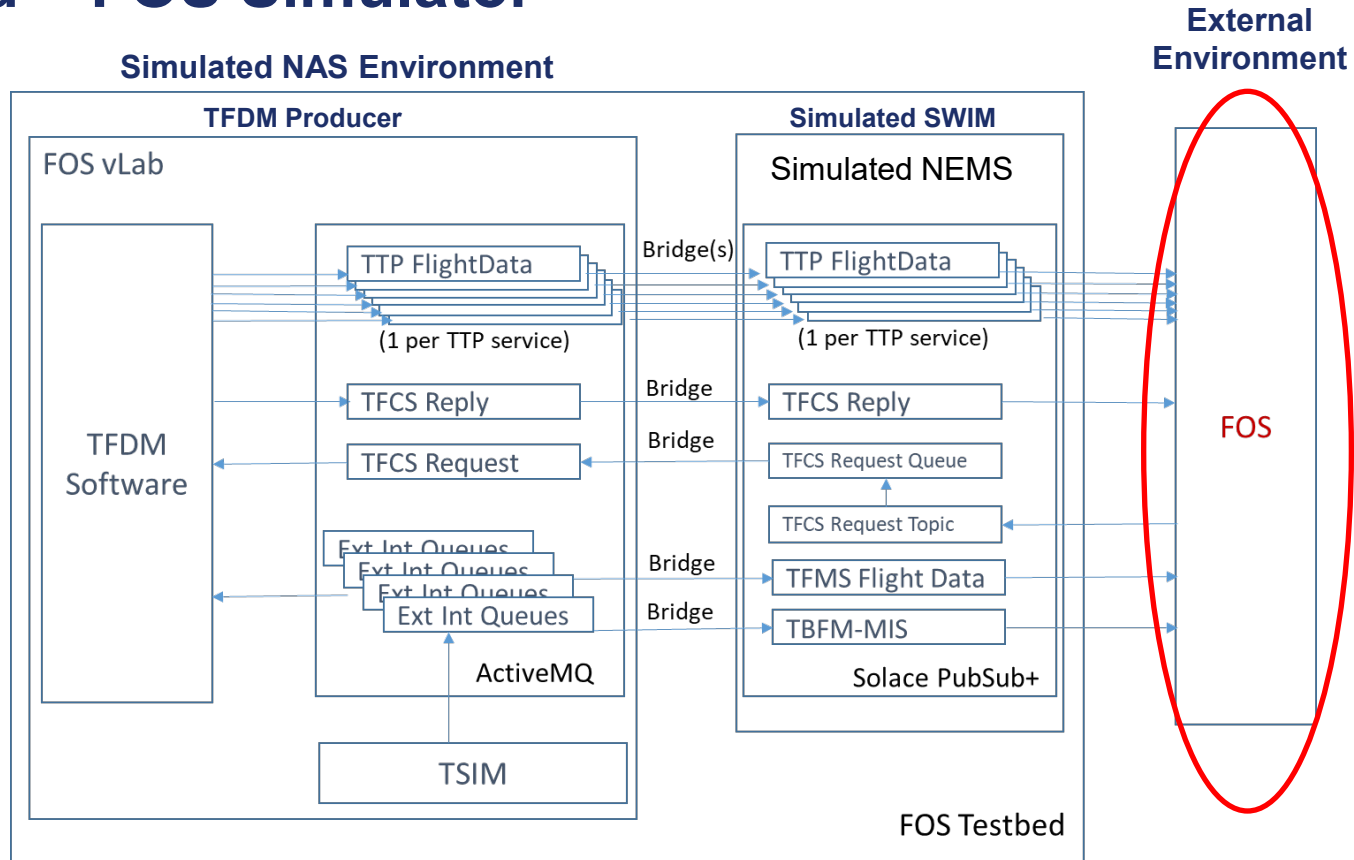
Testbed – Simulator



Testbed – Simulated NEMS



Testbed – FOS Simulator



FOS Testbed Queue Information

Service	JMS Queue	JMSDD
TBFM-MIS received by TFD	TBFM_MIS.OUT	1.1.0
TFMS Flight Data received by TFD	TFMS_FlightData.OUT	3.1 (R14)
TFCS reply	TFCS_Reply.OUT	1.0.0
TFCS request	TFCS_Request.IN	1.0.0
TTP Airport Information	TTP_AI.OUT	2.0.1
TTP Flight Data	TTP_FlightData.OUT	2.0.1
TTP Flight Delay	TTP_FlightDelay.OUT	2.0.1
TTP Operational Metrics	TTP_OM.OUT	2.0.1
TTP Surface Metering Program	TTP_SMP.OUT	1.0.1
TTP Traffic Management Restrictions	TTP_TMR.OUT	3.0.0

Test Cases

Test Case	Flight Data	Flight Delay	AI	TMR	SMP	OM	TFCS
<u>Week 1 - FOS receives TTP messages</u>							
Flight Departure – simple	x						
Flight Arrival – simple	x						
Airport Information – initial set			x				
Operational Metrics – initial set						x	
Operator System Start Up	x	x	x	x	x	x	x
<u>Week 1 - FOS sends/receives TFCS request/response</u>							
NMA Closure			x				x
NMA Gridlock			x				x
<u>Week 2 - FOS receives TTP messages</u>							
Flight Departure - ATC commands	x					x	
Flight Departure – Delay	x	x					
Closure in AMA			x				
SMP Params/Config					x		
Traffic Mgt Restrictions (& effect on departure)	x			x			
Recommended SMP (& effect on departures)	x				x		
Affirmed SMP (& effect on departures)	x				x	x	
Recommended SMP Adjustment (& effect on departures)	x				x		
Completed SMP					x		
<u>Week 2 - FOS sends/receives TFCS request/response</u>							
Flight Substitution	x				x		x

Flight Departure Test Case

- **Flight Departure – simple**

- Overview: A departure pushes back, transits the ramp, crosses into the AMA, taxis to the runway and takes off.
- Steps:
 - FOS receives TTP-FlightData FlightAdd message triggered by input to the TFDM system from an external system such as TFMS or FDIO .
 - FOS receives TTP-FlightData FlightUpdate messages as the flight progresses to the runway. These messages contain fields such as:
 - Flight identification fields: ACID, DEP, DEST, IGTD, GUF1, CID, TFDM ID
 - Operational Flight State (AT_STAND, RAMP_TAXI_OUT, AT_SPOT_OUT, AMA_TAXI_OUT, LUAW, TAKEOFF_ROLL, DEPARTED)
 - EOBT, ETD, AOBT, ActualRunwayEntryTime, ATOT, Estimated taxi times, Elapsed taxi time, ActualDepartureSpot, Runway

NMA Closure Test Case

- **NMA Closure**

- Overview: Flight Operator closes a section of the NMA and observes the closure as reflected by the TFDM system.
- Steps:
 - Flight Operator support manipulates FOS to send a TFCS request message, the intent of which is to schedule an NMA closure.
 - FOS receives TFCS response message indicating success of request.
 - FOS receives TTP-AirportInformation message indicating the NMA regions are scheduled for closure.
 - Flight Operator support manipulates FOS to send a TFCS request message, the intent of which is to activate the NMA closure.
 - FOS receives TFCS response message indicating success of request.
 - FOS receives TTP-AirportInformation message indicating the NMA regions' closure has been activated.
 - Flight Operator support manipulates FOS to send a TFCS request message, the intent of which is to update information pertaining to the NMA closure.
 - FOS receives TFCS response message indicating success of request.
 - FOS receives TTP-AirportInformation message indicating the NMA regions' closure has been updated.
 - Flight Operator support manipulates FOS to send a TFCS request message, the intent of which is to deactivate the NMA closure.
 - FOS receives TFCS response message indicating success of request.
 - FOS receives TTP-AirportInformation message indicating the NMA regions' closure has been deactivated.

SMP Affirm Test Case

- **SMP Affirmed (& effect on departures)**

- Overview: Building on a previous Test Case, a recommended SMP is affirmed. TMATs are assigned. Some flights are held at the gate, some progress. Metrics are gathered.
- Steps:
 - LFIS TMC affirms the SMP.
 - FOS receives TTP-SMP smpDataMessage containing information about the SMP including the new status of “affirmed”.
 - FOS receives TTP-FlightData FlightUpdate messages for flights affected by the SMP and their newly assigned TMATs.
 - FOS receives TTP-SMP smpFlightListUpdate message listing the flights affected by the affirmed SMP and their TMATs.
 - LFIS controller issues commands for a subset of the flights to advance them toward the runway and eventually the strips are archived.
 - Periodically, at 15 minute intervals, FOS receives TTP-OperationalMetrics messages. These messages contain metrics such as:
 - Airport Throughput KPI
 - Airport Canceled Demand KPI
 - Calculated Fuel Burn KPI
 - Queue Length Accuracy KPI
 - SMP Changes KPI
 - RDR Accuracy KPI
 - Metering Time Compliance KPI
 - Stability of Metering Times KPI
 - Flight Times Actual vs. Predicted

Flight Substitution Test Case

- **Flight Substitution**

- Overview: Building on previous Test Cases, the Flight Operator makes a Substitution Request and observes changes to flights' target times.
- Steps:
 - Flight Operator support manipulates FOS to send a TFCS request message, the intent of which is to swap TMATs between flights.
 - FOS receives TFCS response message indicating success of request.
 - FOS receives TTP-FlightData FlightUpdate messages for flights with their newly assigned target times.

Questions?



INTERMISSION

SWIFT Update: New York Area Study On *Early Planning For Disruptions*

SWIFT 14

Presented to: SWIFT

By:

Chris Gottlieb – JetBlue Inc.

Mark Hopkins – LS Technologies

Date:

May 27, 2021



**Federal Aviation
Administration**



SWIFT Recap & Context

- **Case Study Origins:**
 - Selected NY Metro Area for case study due to their daily vulnerability for SWAP
 - Sought alerting capabilities to support real-time tactical decisions by FAA and Carriers
- **Approach to Modeling Case Study:**
 - Visualize Traffic Management Initiatives (TMI) -related delays resulting from aircraft deviations over fix
 - Leverage open-source data to evaluate deviations along flight trajectories
 - Support back-end database and analytics for post Ops studies
- **Case Study Evolution:**
 - Seek to improve delay forecasting outlook for NAS stakeholders
 - Compare results with other legacy forecasting tools
 - Apply case study model to other NAS Metroplexes to mitigate impacts

Case Study Trajectory

Identify

Investigate

Analyze

SWIFT 9 - 11

- *Define Problem Statement*
- *Define Operational Context*
- *Identify Ops Impacts through Tabletop Discussions*

SWIFT 12 - 14

- *Solicit Ops SME Input*
- *Investigate Data Gaps through SWIM Services*
- *Solicit DAFG Support*
- *Leverage Historical ZNY/N90 Studies*

SWIFT 15 - 17

- *Engage DAFG for Model Development & Support*
- *Apply Context to Data*
- *Compare Legacy Forecast Tools with Model Results*

Operational Condition: Setting the Stage

Identify

Investigate

Analyze

- **NAS Operational Improvement Goals:**

- Identify drivers and key indicators that would inform disruptions to airspace user operations earlier
- Apply SWIM Information Services to improve operational decision-making through advanced planning
- Use Tabletop exercise to capture key procedures, operational processes and relevant information to study application of data analytics and machine learning to improve operational decision-making

- **Operational Problem Statement:**

- Traffic Management Initiatives (TMI) and related delays resulting from Aircraft deviations over fix
 - There is no clear way to readily identify aircraft deviation indicators (e.g., weather, traffic volume) and anticipate en route delays
 - There is a lack of available post-ops data analysis to determine threshold boundaries for traffic deviation and where disruptions are severe
 - This limits the operational community from effectively planning or implementing work-arounds for airspace condition changes and resource constraints

- **Environment:**

- NAS Northeast Region Centers: ZNY, ZOB, ZBW, ZDC
- New York metro and Vermont airports: LGA, JFK, EWR, TEB, HPN and BTV
- Airways and jet routes impacted by Traffic Management Initiatives (TMI) events or closures

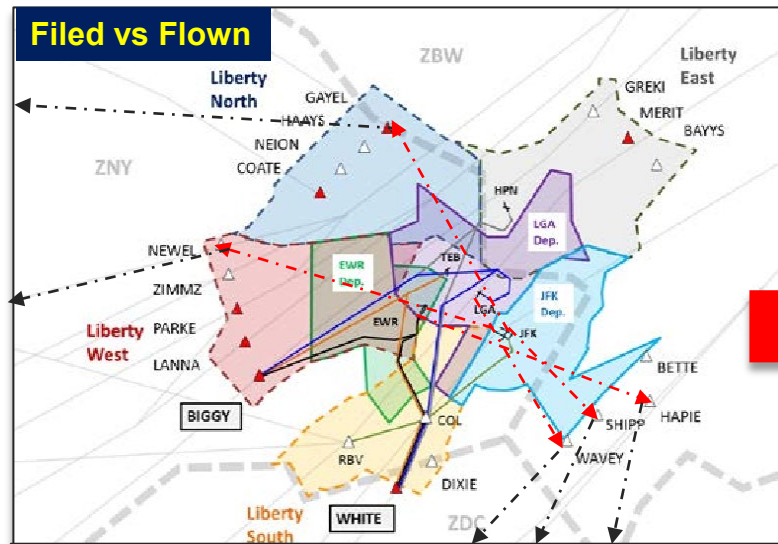
Ops Context Diagram [Departures Example]

Identify

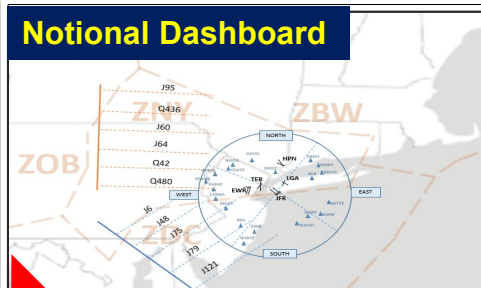
Investigate

Analyze

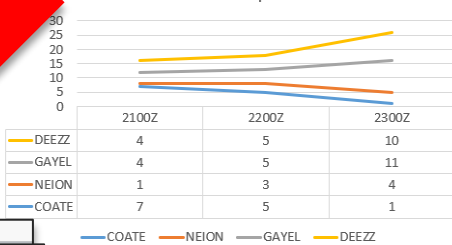
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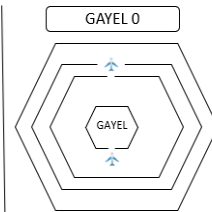
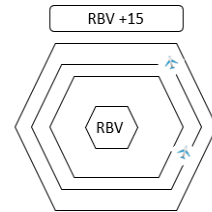
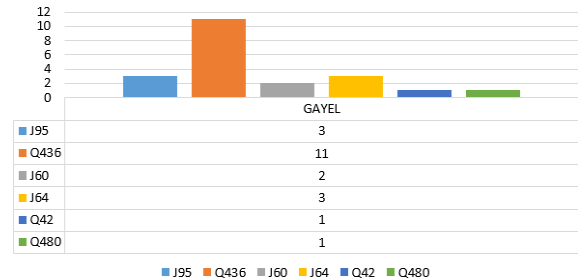
Notional Dashboard



Filed North Gate Departure Fixes



GAYEL Departures



COATE
NEION
GAYEL
DEEZ
WHITE
WAVEY
DIXIE
SHIPP
RBV

ID	Flight ID	Departure	Filed Fix	Fix Flown	Result	Taxi Time	IGTD	ATOT
1	JBU001	JFK	RBV	RBV		31	1730Z	1907Z
2	JBU002	JFK	RBV	WHITE	Deviated	44	1735Z	1911Z
3	JBU003	JFK	COATE	GAYEL	Deviated	26	1751Z	1904Z
4	AA004	LGA	WAVEY	SHIPP	Deviated	102	1705Z	1852Z
5	AA005	LGA	WHITE	WAVEY	Deviated	33	1715Z	1830Z
6	DAL006	JFK	RBV	NEWEL	Deviated	41	1645Z	1755Z
7	DAL007	LGA	GREKI	GREKI		27	1705Z	1901Z
8	UAL008	EWB	BETTE	HAPIE	Deviated	52	1800Z	2002Z
9	SWA009	LGA	SHIPP	SHIPP		43	1725Z	1810Z

Access to early alerting based off historic, filed or amended trajectories.

Understanding deviation location and severity.

- Honeycomb application can drive fix deviation visualization
 - Escalation of alerts based on how severe flight deviations are
 - Notionally display the operational timeline and metrics of fix utilization



Approach: Case Study Methodology

- Analyze drivers that lead to Irregular Ops (IROPs) that result in NAS impacts
- Distinguish root cause (deviation from trajectory) & related symptomatic issues
- Investigate available & relevant data elements from SWIM Information Services
- Identify additional data elements that may not be published via SWIM
- Begin to look at other contributing factors (i.e., weather), and related sources
- Analyze previous work to identify relevant contributions
- Connect to SWIM Information Services & collect relevant data
- Identify key parameters that can be modeled for analysis
 - Analyze collected data vs real-world IROP conditions to identify operational environmental drivers
 - Forecasted vs Actual: Delay Metrics – (Demand Vs Capacity, Trajectory Deviations, etc.)
- Build prototype AI/ML algorithms for predictive analysis



Approach: Brainstorming Desired Outcomes

- **Goal: How do we improve planning and execution for IROP events?**
 - Improved customer scores/ reduce customer disruption
 - Reduction in gate returns (pushing)
 - Prediction of overall delays
 - Reduction in overall delays
- **Objective: Identify factors and variables that drive suboptimal throughput**
 - Prioritized list of Ops impacted by disruptions
 - Crew times
 - Customer impacts
 - Equipment schedule and usage / Ground Ops
 - ATC improved planning and execution for IROPs
 - Identify anticipated level of impact on operations
 - Arrival trajectories
 - Departure trajectories



Approach: Brainstorming Problem Inputs

- **Level of control ATC will impose via TMI**
 - Initiatives or actions typically taken tactically or based on SOPs
 - Predicting airport rates beyond 1-hour mark
- **Airlines input into TMI program rates**
 - Adjusting parameters based on actual (real-time) NAS Ops performance
 - Cancelling or adjusting programs early
- **Surface Management execution**
 - Insight into how departure fixes are available and allocated
 - Insight into the interdependency between departure resources and environmental constraints



SWIM Data: Departure Deviation

Identify

Investigate

Analyze



Anticipated DEP Fix Loads

Information Gap: Aggregating data on DEP fix constraints to support alerting around crew issues.

- **Relevant SWIM Business Service: SFDPS – En Route Airspace Data Publication**
 - *ERADP is the SFDPS service that publishes airspace assignment, status, and other airspace-related messages derived from messages received from HADDS.*
 - *Sector Assignment Status message (SH) provides information associated with airspace. The Sector Assignment Status Message is used to communicate current sector and TRACON configurations. A sector or TRACON may either be closed or open. If the sector or TRACON is open, it is composed of one or more FAVs.*
 - *Route Status message (HR) is used to communicate whether some adapted departure and/or arrival routes are active or not. A route status is indicated by the route name followed by either “ON” or “OFF.” ERAM generates an HR when an assignment at a center changes, or when reconstituting data. A single HR contains only route assignments for that one center and can include one or more routes.*



Speed Restrictions from ARTCC

Information Gap: Speed restrictions may be imposed at ARTCC when traffic begins to flow off-nominally. In certain cases, this may not be communicated to TRACON. This information is typically not logged or shared unless the controller informs their supervisor, who in turn, would inform traffic management. In this case, speed restrictions could be deduced from the radar view (e.g. observing ground speeds).

- **Relevant SWIM Business Service: SFDPS – En Route General Data**
 - *General Information message (GH) is used to communicate a free-form text message from one facility to one or more other facilities. The content of the message is the free-form text, contained in an interfacility remarks field (11c).*





General Fix Availability

Information Gap: Departure deviations are difficult because the route structures in N90 are very close together. We would want to know where a pop-up storm could develop that could lead to deviations on a route. We could then coordinate ways around the weather, or ways outbound.

We also want to know if we should reroute flights on the ground waiting; estimates on how long fixes would be impacted also help. Its problematic when routes are shutoff, so we would want to get reroutes in earlier and make use of all available routes. This supports decision points for dispersing traffic over multiple available fixes.

- **Relevant SWIM Business Service: TTP: Flight Delay Service**
 - *The TTP Flight Delay service provides flight-specific information about the current delays for all flights departing from or arriving to the TFDM facility. The **Aircraft Departure Delay Time** data elements provide information on surface aircraft delay start and end times.*
- **Relevant SWIM Business Service: Integrated Terminal Weather System (ITWS)**
 - *ITWS provides a variety of weather information in graphic and textual forms, such as wind shear and microburst predictions, storm cell and lightning information, and terminal area winds aloft. For example:*
 - *The Microburst TRACON Map Product is made up of a microburst header containing information about the TRACON, followed by a list of from one to four radars (TDWRs).*
 - *The Gust Front Product is made up of a gust front header, followed by a list of radars (TDWR). Each radar structure includes zero to five gust front detections.*



En Route Flight Track Changes

Information Gap: Understanding when and why ATC issues flight reroutes or events that involve changing a flight trajectory (e.g. DEP fix, ARR fix, waypoints)

- **Relevant SWIM Business Service: SFDPS – En Route Flight Data Query**
 - *Flight Amendment Information messages (AH) are used to resend all data/fields in the Flight Plan Information message when an amendment has been made to one or more of those fields. This message includes the AH ERAM.*
- **Relevant SWIM Business Service: TFMDData: Flow**
 - *The Reroute Message defines a Reroute TMI. It is sent when a Reroute is proposed, issued, revised, or cancelled. Associated Flight Data Messages: TFMS sends messages to model flights on their assigned routes, or to model flights back on their historical routes after a Reroute is cancelled.*
 - *Note: The TFMDData service includes data about restrictions and constraints that are created, issued, and maintained externally to TFMS. TFMS receives notifications for some of these TMIs. In these cases, TMI generates a message passing through the definition of the TMI. For example:*
 - *Restrictions are received from NTML and sent using a restriction (flow) message. Restrictions are primarily used to define mile-in-trail (MIT), altitude, and speed restrictions. Restrictions have start end and times like TMIs. If a restriction is revised or cancelled, TFMS sends a new restriction message.*



Managing Deviations Beyond TRACON

Information Gap: Due to routes into ZNY being tightly knit (e.g. flights coming in from ZOB), separating flights by altitude is somewhat difficult and requires internal TRACON coordination. This is easier to do with flights coming from ZDC rather than ZOB. During severe weather, we would want to move traffic out of ZNY, away from departures. We must know where to cut off the line from the west and perhaps reroute flights to ZBW, for example.

- **Relevant SWIM Business Service: TBFM Metering Information Service**
 - STAs and ETAs
 - Airport Configuration Information
 - Satellite Airport Configurations

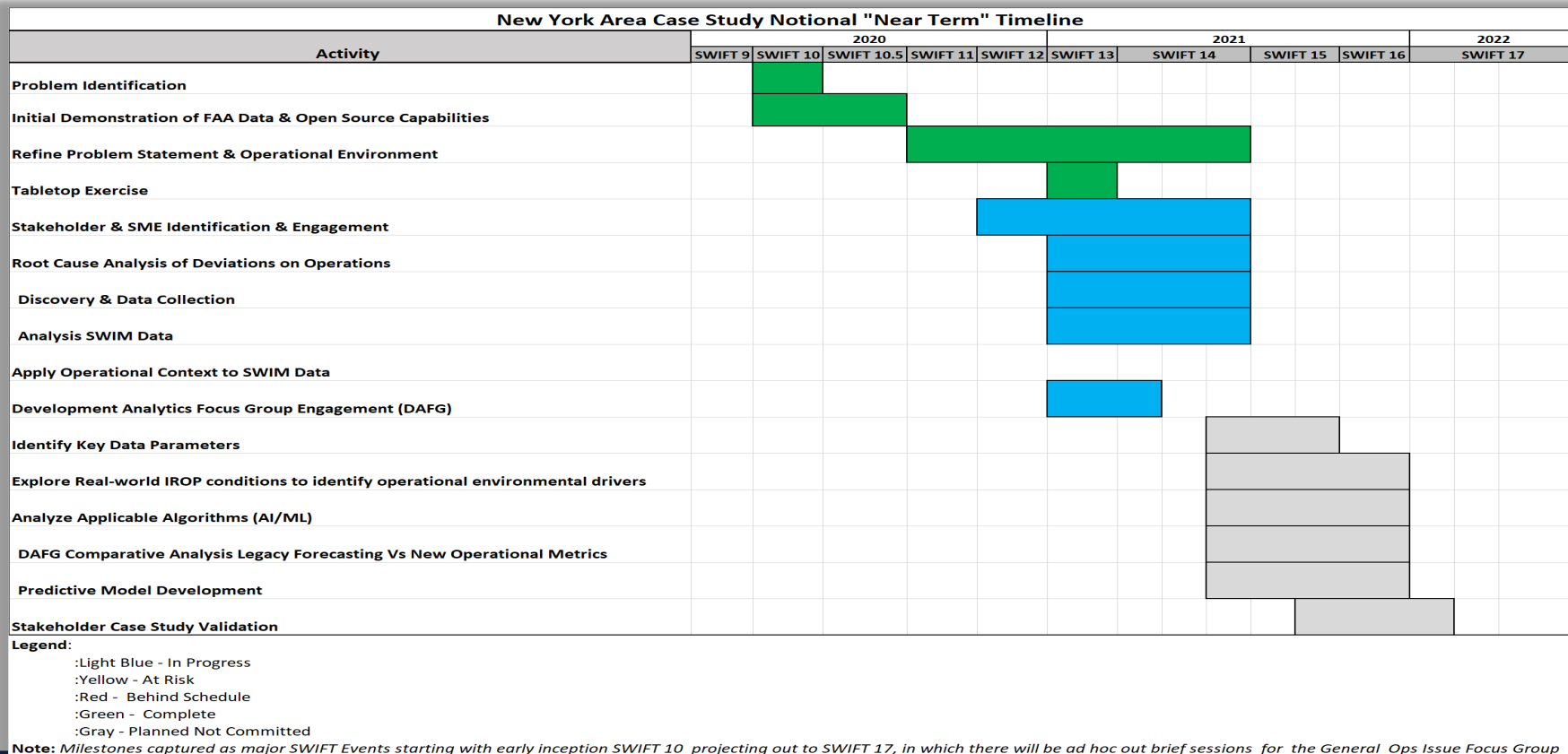


Partial Airspace Restrictions

Information Gap: During weather events, we would typically restrict the entire flow into ZNY airports (e.g. AFPs, GDPS, etc.), but sometimes only the southern routes require restrictions. For example, if there are clear routes from ZBW to ZNY, why restrict these areas too? Combining routes (which is difficult to do in TRACON space) is something that wasn't done enough. ZDC does this routinely, which also helped manage flows into EWR and LGA without needing a GDP (ZNY-bound flights).

- **Relevant SWIM Business Service: TFMData: Flow**
 - TFMS Restriction Messages
 - TMI Advisory and Compression Messages

Notional “Near Term” Timeline



Next Steps for SWIFT 15

- Data Collection & Analysis
 - Investigate additional information gaps; what else is needed?
 - Correlation between arrival trajectory deviations and taxi-out delays
 - Continued data discovery through SWIM Services
 - Explore previous studies done with the New York Metro Area
- Engagement with DAFG
 - Collaborate to incorporate Honeycomb functionality
 - Establish metrics for delay mitigation and/or success criteria
 - Collaborate on indicators for Predictive Analytics



Want to join the case study efforts? Join us!

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Xavier Pratt- Xavier.Pratt@lstechllc.com

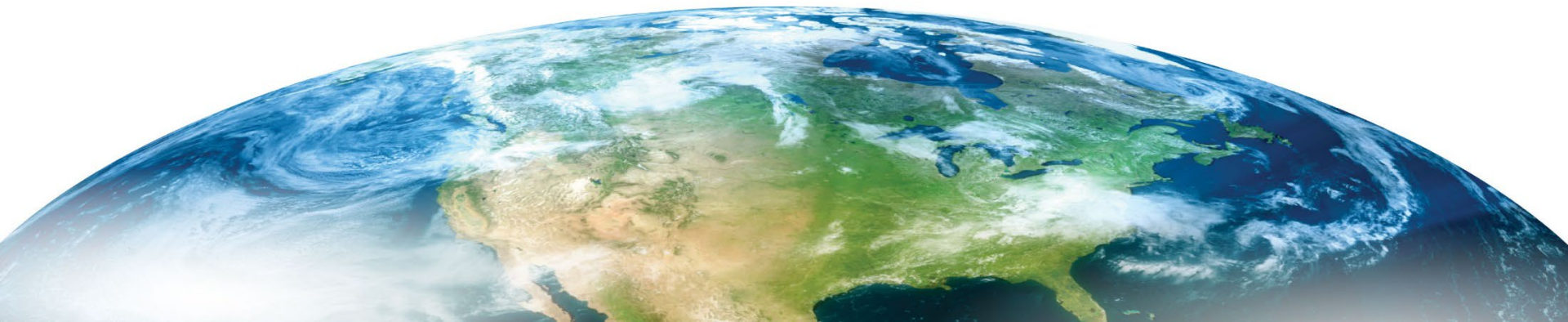




Federal Aviation Administration's

Trajectory Based Operation

Presented by: Steve Bradford, FAA
Chief Scientist for NextGen and Architecture

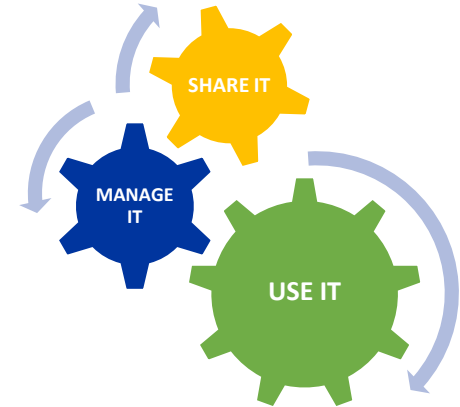


ICAO TBO Concepts

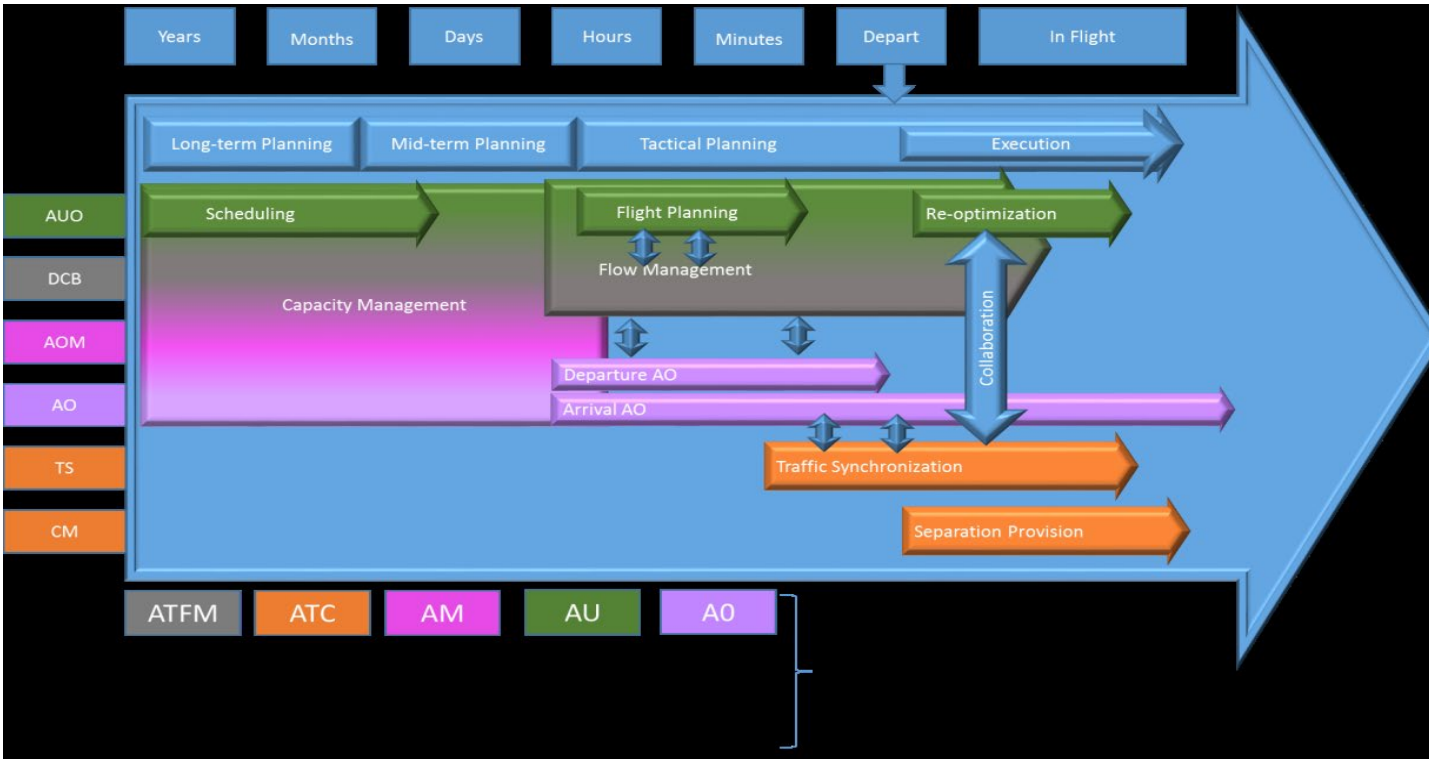
The trajectory describes the lateral, vertical and temporal profile of a flight. TBO shares the common plan for a flight's trajectory. Accuracy, and control to that plan is tailored to the performance needs of the circumstances. The ATC Clearance is the means through which the trajectory is delivered.

TBO requires an efficiently-converging coordination process across concept components leading to stable, consistent and robust trajectory solutions.

TBO supports a Performance-Based ATM System. For example, the use of trajectory constraints should be minimized to the extent possible and to the tolerance level commensurate with the performance needs of the GATMOC Component it serves. Airborne operations should not be constrained more than is strictly required to meet the performance needs of the ATM System.



Trajectory Evolution



AM – Airspace Management
 ATFM – Air Traffic Flow Management
 AU – Airspace User
 ATC – Air Traffic Control
 AO – Aerodrome Operator

Enabler for TBO: Robust Information sharing

WE KNOW:

STATE & INTENT

PERFORMANCE

CONSTRAINTS

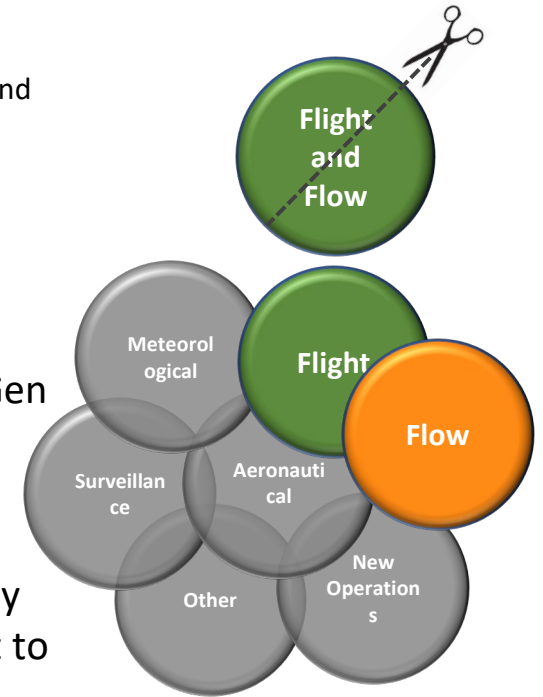
UNCERTAINTY



AVOID THE GUESSWORK

Enabler for TBO: Flow Information eXchange Model (FLXM)

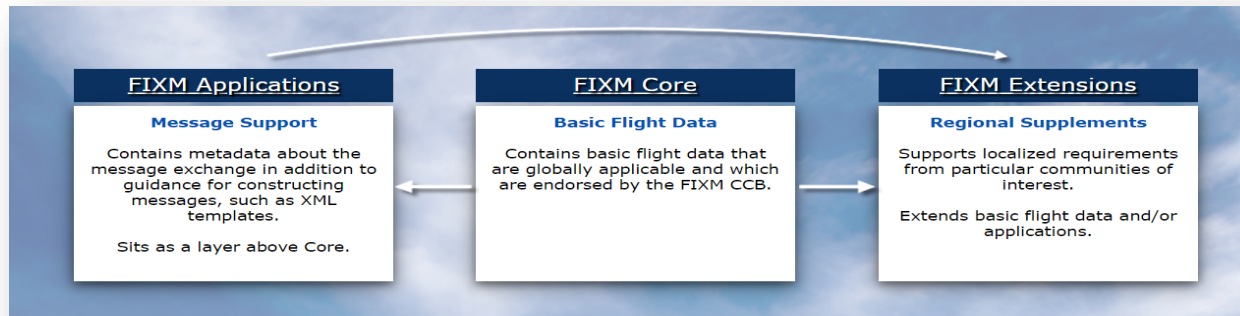
- Required ATFM information is not covered in the core elements of existing Exchange Models (XM).
 - To date, Flight, Aeronautical, Weather and Surveillance information have been identified and incorporated into the global exchange models (i.e. FIXM, AIXM, iWXXM, and ASTERIX respectively)
 - Flight Information Exchange Model (FIXM) supports Flight and Flow for a Collaborative Environment (FF-ICE). However, the focus has been predominantly on identifying and incorporating single, flight-specific information rather than flow information.
- Incorporating the ATFM information is necessary to complete the NextGen envisioned operational environment and achieve the pathway to full Trajectory-Based Operations (TBO).
- Flow Information Exchange Model (FLXM) is a new standard proposed by the FAA for ATFM information exchange in support of the broader effort to implement enterprise-wide information exchange standards.



ICAO Identified Information Domains
with Flow Information

Enabler for TBO: Flight Information eXchange Model (FIXM)

- FIXM is the international data standard for flight information
- FIXM adoption enables interoperability and provides efficient communication between systems, supporting the realization of innovative solutions in aviation
- The FIXM data standard supports the exchange of flight information between NAS systems across multiple domains and International systems



Differences Between FLXM and FIXM: Rule of Thumb

Flight

When there is no ATFM measure, is the flight data required for operations?

Yes, then data is represented in FIXM.

Flight

Flight Plan Originator
Flight Plan Submitter
GUF1
Aircraft Operator
Departure Aerodrome
Filed 4D Trajectory
Persons on Board

Example
flight-specific
elements in
FIXM

Flow

When there is an ATFM measure, is the flight data required for the measure or for flight operator flexibility?

Yes, then the data is represented in FLXM.

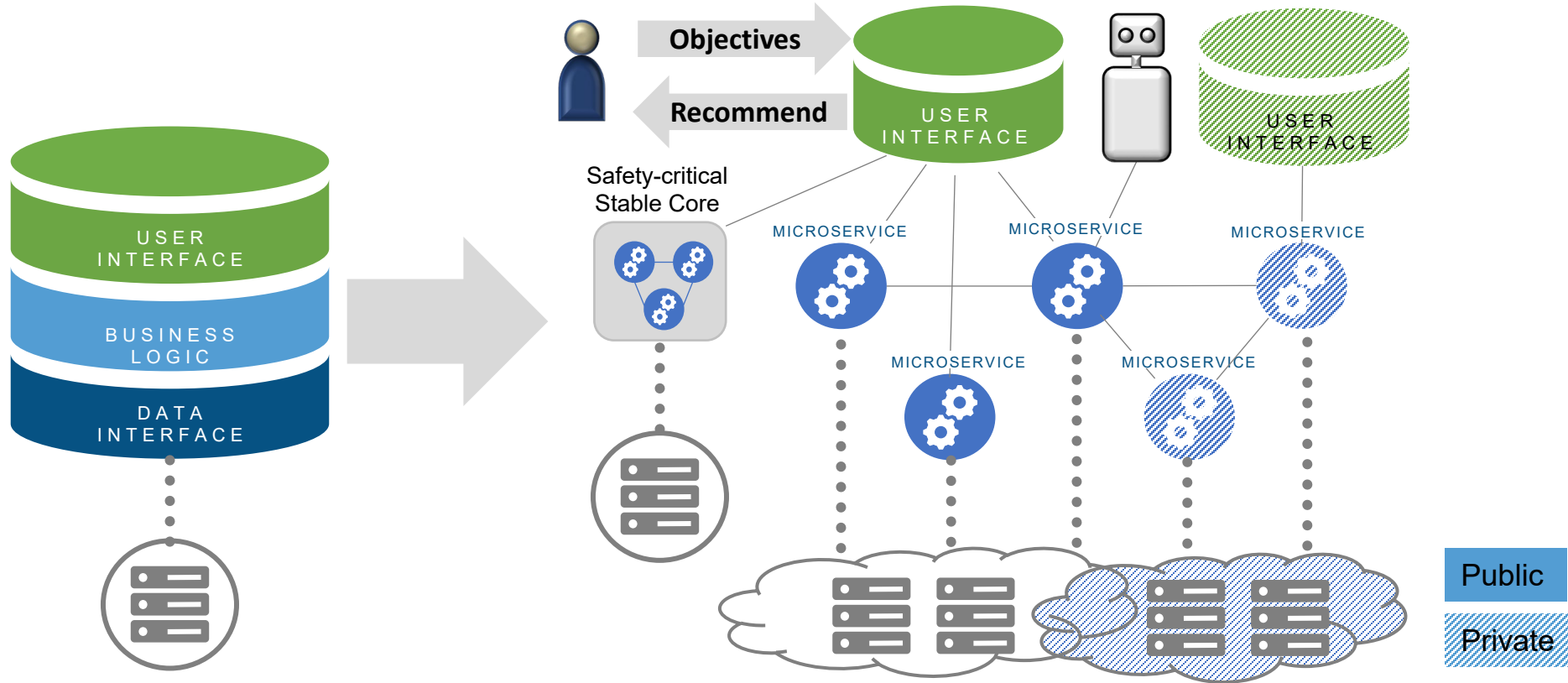
Flight

Flight Plan Originator
Flight Plan Submitter
GUF1
Aircraft Operator
Departure Aerodrome
Filed 4D Trajectory
Persons on Board
Control Departure Time
Control Arrival Time
Control Route Segment
Control Speed

Flight-specific elements
that are artifacts of an
ATFM measure in FLXM.

They would not be
present if there was no
ATFM measure in place.

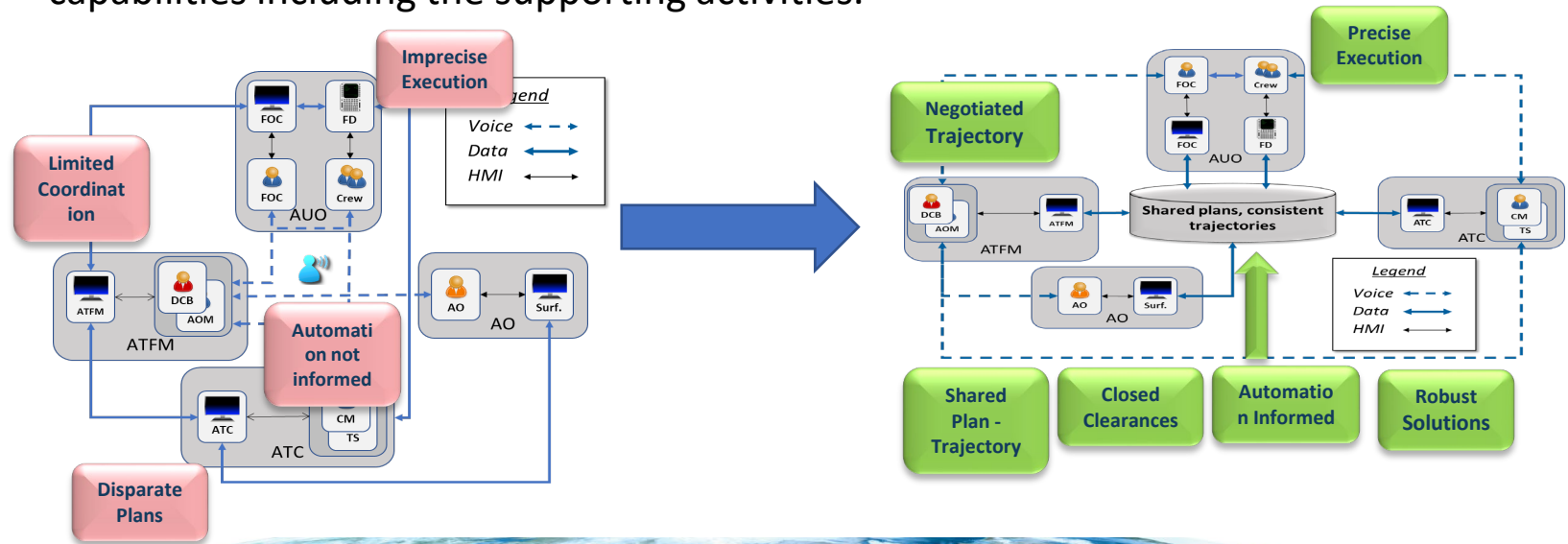
Automation Evolution Vision



TBO: Research and Validation

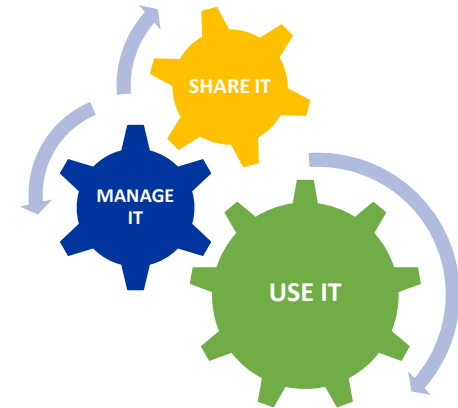
Objective - to support the development of the roadmap for TBO:

- Conduct research and validation activities to mature TBO capabilities,
- Identify geographical and information constraints
- Leading to the development of the roadmap that layout the timeline for TBO capabilities including the supporting activities.



Multi Regional TBO Capabilities

- Pre-departure – flight planning (FF-ICE R/1)
- Post-departure - shared trajectory information (FF-ICE R/2)
- Re-route (4D Trajectory) due to destination and/or schedule change (ATFM and FF-ICE)
- Integration of ATFM and AMAN



THANK YOU



SWIFT Portal Release

Overview and Update

Presented to: SWIFT

By: Mike Pozsgay – FAA
Doug Harvey – L3Harris

Date: May 27, 2021



**Federal Aviation
Administration**



SWIFT Portal Deployment

SWIFT Portal Now Live!
Deployed on May 26th

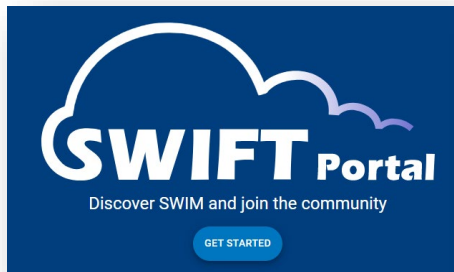
Logging into SCDS will automatically redirect you to the new the new SWIFT Portal page. Your SCDS account, password, and subscriptions have been migrated automatically.

Redirect will be in place for around a year, but please update your bookmarks!

Two issues still to be addressed with subsequent updates:

- * Organizations with outbound firewall rules which don't support the use of hostnames. Static IPs to be provided.
- * Portal emails will continue to come from an @cinnato.com address. Future change will come from an easily recognizable @faa.gov email.

SWIFT Portal Overview



SWIFT Portal is a publicly accessible cloud-based infrastructure that brings new capabilities which build upon the SWIM Cloud Distribution Service (SCDS)

This release brings a new initial portal interface comprising of five (5) high-level capabilities that aim to enable aviation partners and community members to discover, learn, support, collaborate, and benefit from access to SWIM data

SWIFT Portal will replace the existing URL (scds.swim.faa.gov) but will not change the underlying SCDS service



SWIFT Community Forum

Connect with the SWIM community, share knowledge and ideas with the aviation community, and learn what is new with SWIM in the News section of the forum.



SWIM Service Discovery

Learn about SWIM data products before subscribing. Visit the [NAS Service Registry and Repository \(NSRR\)](#) for service documentation, including service operational context and use case documents.



SWIM Cloud Distribution

Utilize our cloud platform to connect, consume, and manage your SWIM data subscriptions. This new service offers self-service provisioning, data filtering capabilities, and subscription metrics.



SWIM Service Status

Check the current status of SWIM services and client connections to assist with troubleshooting. These insights provide users with information that was previously unavailable.



Help & Support

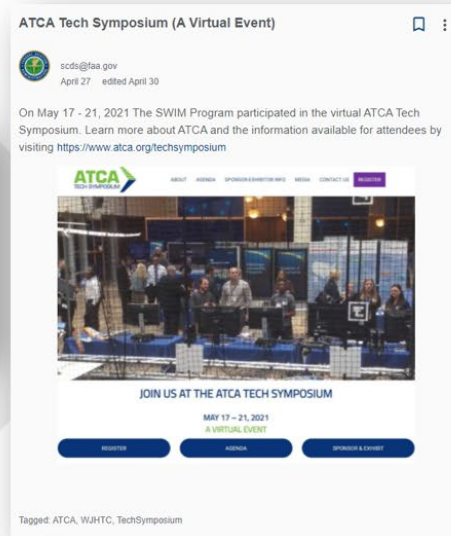
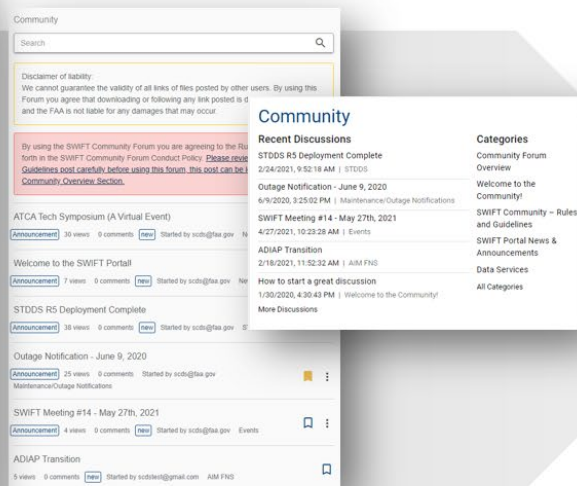
Seek help and obtain guidance and support through a self-service knowledge base. Review FAQs, online guides, monitor ticketing, ask a question or live chat with support

Community Forum



SWIFT Community Forum

Connect with the SWIM community, share knowledge and ideas with the aviation community, and learn what is new with SWIM in the News section of the forum.



- ✓ News
- ✓ Sharing
- ✓ Knowledge
- ✓ Discussion
- ✓ Ideas
- ✓ Collaboration
- ✓ Community

Learn the latest SWIM news, share your ideas with others and expand the knowledge base
Discuss and collaborate with fellow aviation partners and community members

SWIFT 14 May 27th 2021




Federal Aviation
Administration


Service Discovery





SWIM Service Discovery


Learn about SWIM data products before subscribing. Visit the [NAS Service Registry and Repository \(NSRR\)](#) for service documentation, including service operational context and use case documents.


**SFDPS**
SWIM Flight Data Publication Service
The System-Wide (SWIM) Flight (SFDPS) provides National Air consumers. It receives real-time processes, res
LEARN MORE

**TBFM**
Time Based Flow Management
Time Based Flow Management (TBFM) enhances National efficiency by using TBFM decision-making already deployed traffic control in the United States. In p
LEARN MORE

**ITWS**
Integrated Terminal Weather Service
The Integrated Terminal Weather System (ITWS) provides improved integration of weather data into timely, accurate aviation weather information. The ITWS will integrate terminal weather data to automatically provide current weather information and predictions in easily understood graphic and textual form, including wind shear and microburst predictions, storm cell and lightning information, and terminal area winds aloft. It also provides a 60-minute forecast of anticipated weather conditions.
Services: Standard, Alerts
LEARN MORE

**AIM FNS**
Aeronautical Information Management
Federal NOTAM System
Accurate, timely information is a efficiency of the (NAS). The Federal a component of f of the FAA's AIM1
LEARN MORE

**TFMS**
Traffic Flow Management System
The TFMDATA AA's Traffic (TFMS) is a management System wide national Airps Messaging Ser
LEARN MORE

**STDDS**
SWIM Terminal Data Distribution System
SWIM Terminal Data Distribution System (STDDS) converts legacy terminal data collected from airport towers and Terminal Radar Approach Control (TRACON) facilities into easily accessible information, which is published via the National Airspace System (NAS) Enterprise Messaging Service (NEMS).
Services: ISMC, APDS, SMES, TDES, TAIS
LEARN MORE

TFMS Services

REQUEST

SUBSCRIBE

Status Available
The TFMDATA Status business function provides status of all of the data flows that contribute to TFMDATA.
SWIM Service Product Category: Flight

Terminal Flight Data Available
TFMDATA supports the TFDM program by providing Airline provided data to the TFDM system.
SWIM Service Product Category: Flight

R13 Flight Data Available
Air Traffic Flow Data consists of correlated aircraft flight data information received from various NAS sources and international participants. It contains scheduling and routing data and positional information.
SWIM Service Product Category: Flight

R13 Flow Data Available
Flow information will be provided to FAA-authorized users via NEMS.
SWIM Service Product Category: Flight

Request Reply Available upon request
The TFMDATA service TFMS Request Reply business function provides the capability to interact with the TFMS system in order to provide various information to or request information from TFMS.
SWIM Service Product Category: Flight

International Data Available upon request
The International Data business function provides the capability for TFM to exchange flight data with IGP. The message set was originally designed based on the 2007 and 2012 versions of "Doc 4444 ATM-501 Procedures for Air Navigation Services" from International Civil Aviation Organization. The TFMDATA implementation of International Data carries that original design but makes use of the FIXM standard for message implementation.
SWIM Service Product Category: Flight



- ✓ Discover
- ✓ Locate
- ✓ Learning
- ✓ Download
- ✓ Request
- ✓ Subscribe

Discover, locate and download SWIM Service reference documents from the NSRR
Request data via SCDS or request access to NESG-only SWIM Services

Cloud Distribution



SWIM Cloud Distribution

Utilize our cloud platform to connect, consume, and manage your SWIM data subscriptions. This new service offers self-service provisioning, data filtering capabilities, and subscription metrics.



AERONAUTICAL

Digital NOTAMS, Special Activity Airspace and Special Use Airspace notifications and status



WEATHER

Specialized weather products in the terminal area and Runway Visual Range (RVR) data



FLIGHT/FLOW

Flight and Flow information, metering status, flight plan, and track data



SURVEILLANCE

Airport data such as surface movement events, tower departure, and airport configuration

Select SWIM Product Type

Select the type of SWIM data you would like to subscribe to. After selecting a type you will be able to choose specific SWIM services.



STDDs
STDDs Terminal Data Distribution System (STDDs) provides surface movement data (ASDE-X, ASSC), approach surveillance radar data from STDDs systems, Runway Visual Range (RVR), and a variety of departure event data.

SELECT



ITWS
Integrated Terminal Weather System (ITWS) includes a variety of weather information in graphic and textual forms from 30+ sites.

SELECT



TFMS
Traffic Flow Management (TFMS) provides both flight data (Flight Plans, Departure Arrival Notifications, Position Reports) and flow information (TAM, OS, GDP).

SELECT



TBFM
Time Based Flow Management (TBFM) metering information data includes knowledge of when metering is in effect as an AFTCC when Adjacent Center Metering (ACM) is occurring and at which sites, flight Scheduled Time of Arrival (STAs) to the runway threshold, meter fee and all other flight Estimate Time of Arrival (ETAs) to the runway threshold, etc.

SELECT



SFOPS
SWIM Flight Data Publication Service (SFOPS) provides a variety of En Route flight data, such as flight plans, beacon codes, and headend status. SFOPS also disseminates data regarding airspace, such as sector configuration data, route status, Special Activity Airspace (SAA) status, and alternate settings, and general data including ERAM status information.

SELECT



AIM FMS
Notices to Airmen (NOTAMS) provides information on temporary changes to components of, or hazards in the National Airspace System (NAS) and are distributed by the FAA to alert the aviation community.

SELECT



- ✓ Self-Service
- ✓ Subscribe
- ✓ Jumpstart
- ✓ Samples
- ✓ Compression
- ✓ Monitoring
- ✓ Metrics

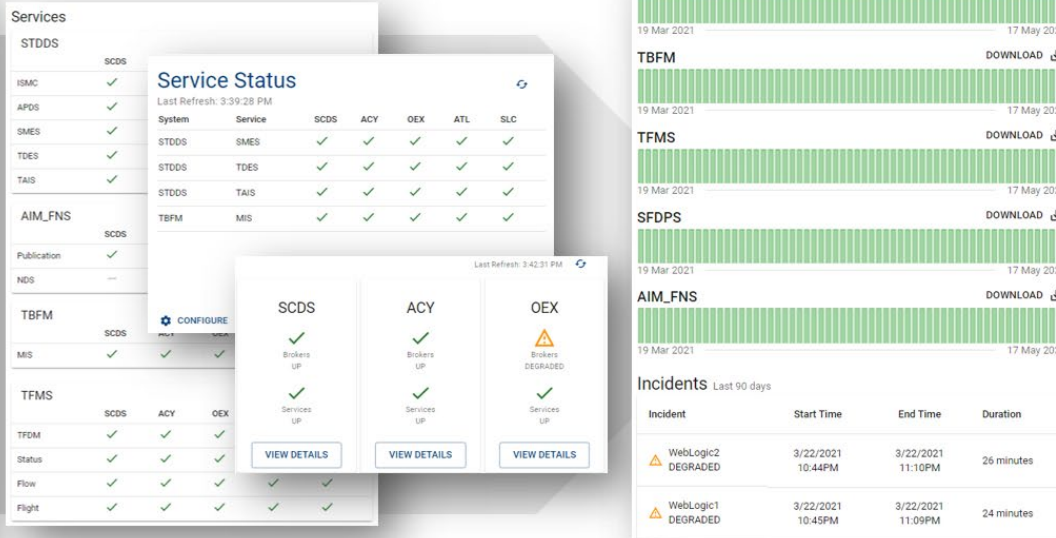
**Quickly request and manage your SWIM services via a self-service, easy-to-use, interface
Jumpstart your connections, view sample data, monitor your subscription and metrics**

Service Status



SWIM Service Status

Check the current status of SWIM services and client connections to assist with troubleshooting. These insights provide users with information that was previously unavailable.



- ✓ Monitoring
- ✓ Real-time
- ✓ Configurable
- ✓ Outages
- ✓ Incidents
- ✓ Health
- ✓ Historical

Quickly review and monitor real-time or historical status of SWIM services
Choose services for real-time status tracking or view historical outages and incidents

Help & Support



Help & Support

Seek help and obtain guidance and support through a self-service knowledge base. Review FAQs, online guides, monitor ticketing, ask a question or live chat with support

How to create a SWIFT Portal account

10 months ago · Updated

Follow

To request an account with SCDS, click on the "GET STARTED" button on the Landing Page. The account request form will then be presented.

Fill out the form, (passwords must be a minimum of 12 characters, contain at least one number, one lowercase letter, one uppercase letter, and one special character) and check the "I'm not a robot" checkbox
Account Inform Name and Phone Verification Page

FAQ

General

What is SCDS?

Who is the target audience for SCDS?

Forgot your password?

Are there plans to migrate operational NESG consumers to use SCDS?

What are the benefits of SCDS over the NESG?

What tools or support is available to me as a new SCDS consumer?

See all 7 articles

Data

What data services are available via SCDS?

Is sensitive data available via SCDS?

Is data compression supported on SCDS?

Does SCDS store SWIM data in the cloud?

Will Automatic Dependent Surveillance-Broadcast (ADS-B) position data be distributed via SCDS?

Some SWIM services today contain duplicative data across service offerings. Will SCDS eliminate this data duplication?

See all 7 articles

Help and Support

Resource that will teach you everything about SWIFT Portal

Search

Have a question about SWIM data? Checkout our documentation or ask our SWIM team.



FAQ



Guide



Ask A Question

Have a technical issue? Contact the SWIM Help Desk.



Call Help Desk
1-855-FAA-NEMC



Email Help Desk
9-ATO-SECC-OPS@faa.gov



- ✓ Search
- ✓ Answers
- ✓ Guides
- ✓ FAQs
- ✓ Support
- ✓ Ticketing
- ✓ Live Chat

Search and gain help via an online self-service knowledge base of helpful guides and FAQs
Find answers, create and track your support tickets, and live chat with support staff

Contact us

Feel free to reach out with question, comment or suggestion to:

SCDS Help Desk

scds@faa.gov

Mike Pozsgay, FAA

michael.pozsgay@faa.gov

Doug Harvey, L3Harris

douglas.harvey@l3harris.com

SWIM Data: Widget Case Study Briefing

SWIFT 14 Update

Presented to: SWIFT

By: Sandie Steele – LST

Date: May 27, 2021



**Federal Aviation
Administration**



- Look ahead on planned traffic across arrival/departure fixes
- 15 – 30 minutes into the future
- How are the fixes performing?
- Trending up or down?

- The need to see real-time fix capacity 'at a glance'
- Small unobtrusive with quick visual alerts

Fix Availability Ticker

- **The Ticker Widget Possibilities:**

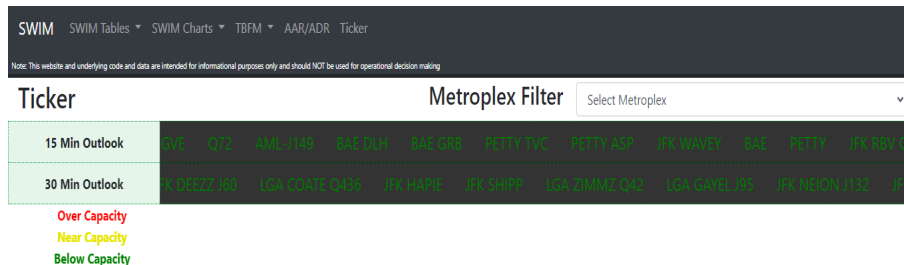
- Small Footprint
- Filter fixes by metroplex

- **Turnover Example:** easy day (unaware fixes nearing capacity)

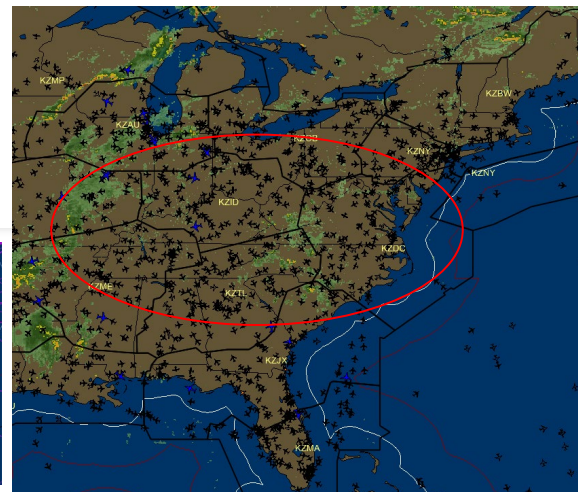
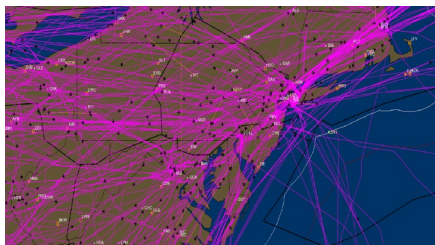
- **Benefits:**

- Earlier mitigation by the dispatcher
- Earlier info given to crews
- Earlier mitigation plan to stations/AOC/ATC

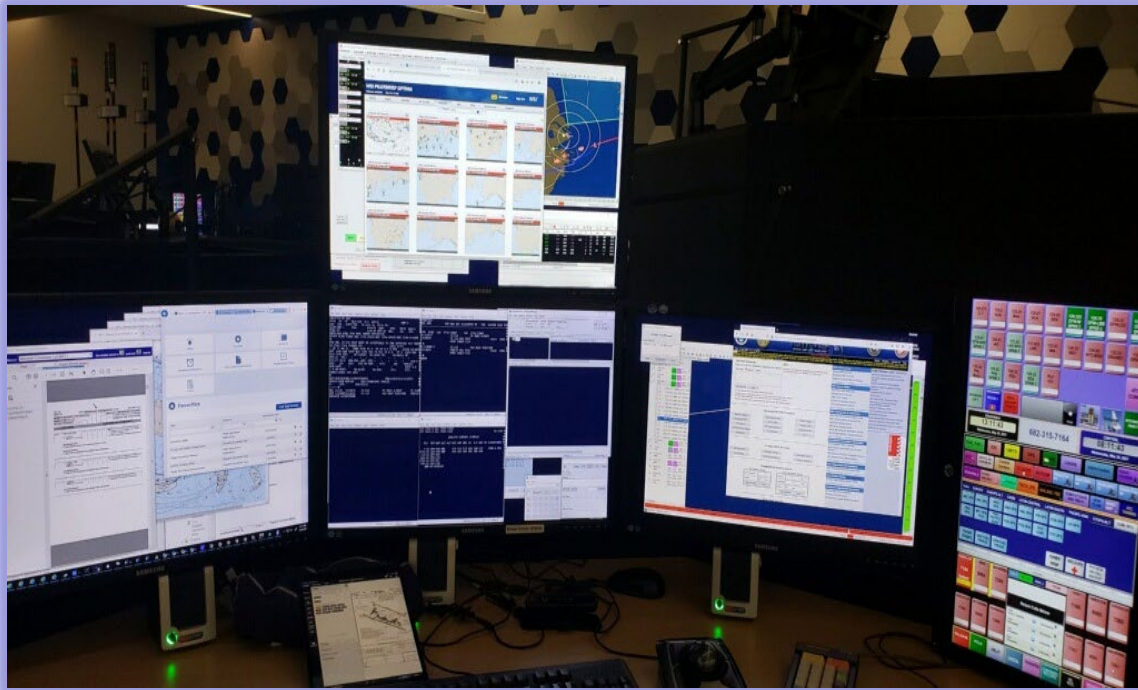
- **Enhancements:** increase look ahead timeframe



Identifies specific fixes with limited capacity



Dispatcher Current View (International Desk)



Dispatchers' bag of apps (to name a few):

DINS (Intl NOTAMs)/FAA NOTAMs; Land and T/O wts; Contaminated rwy correction; Flight Following; Aerobahn; Fusion arrivals; internal flight planning & dispatch apps; screen printer; etops & regular calculator; re-route tool; QRH for every aircraft in air; wx maps for each region; dispatch procedures manual & flight manual. Radio & telephone system.

Issue: The need to see real-time fix capacity 'at a glance'

Solutions: Add a minimalist 'ticker' to top or bottom of a screen –or- incorporate into company or vendor app to give back monitor real-estate...

Information Services Roadmap

SWIFT 14 Update

Presented to: SWIFT

By: Xavier Pratt – LST

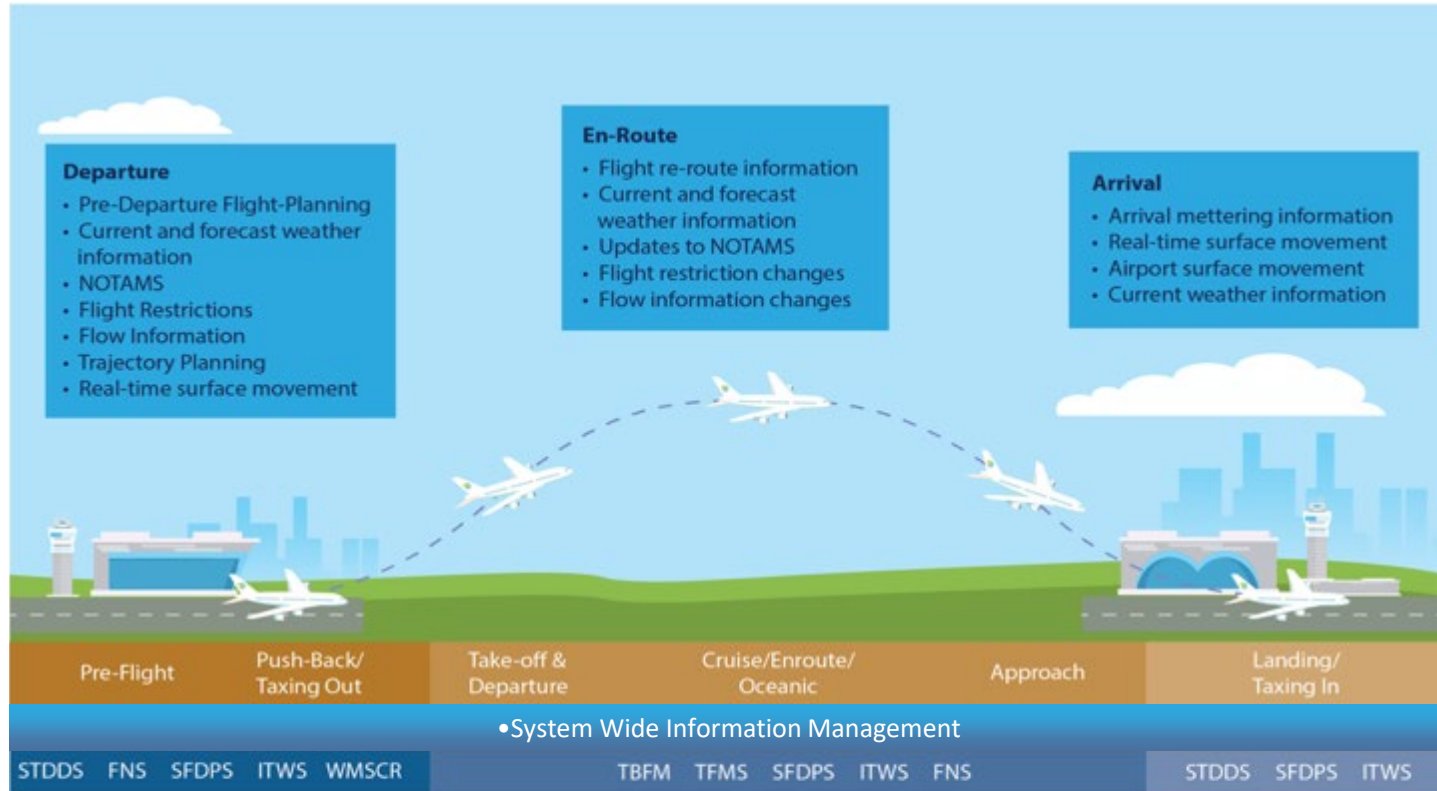
Date: May 27, 2021



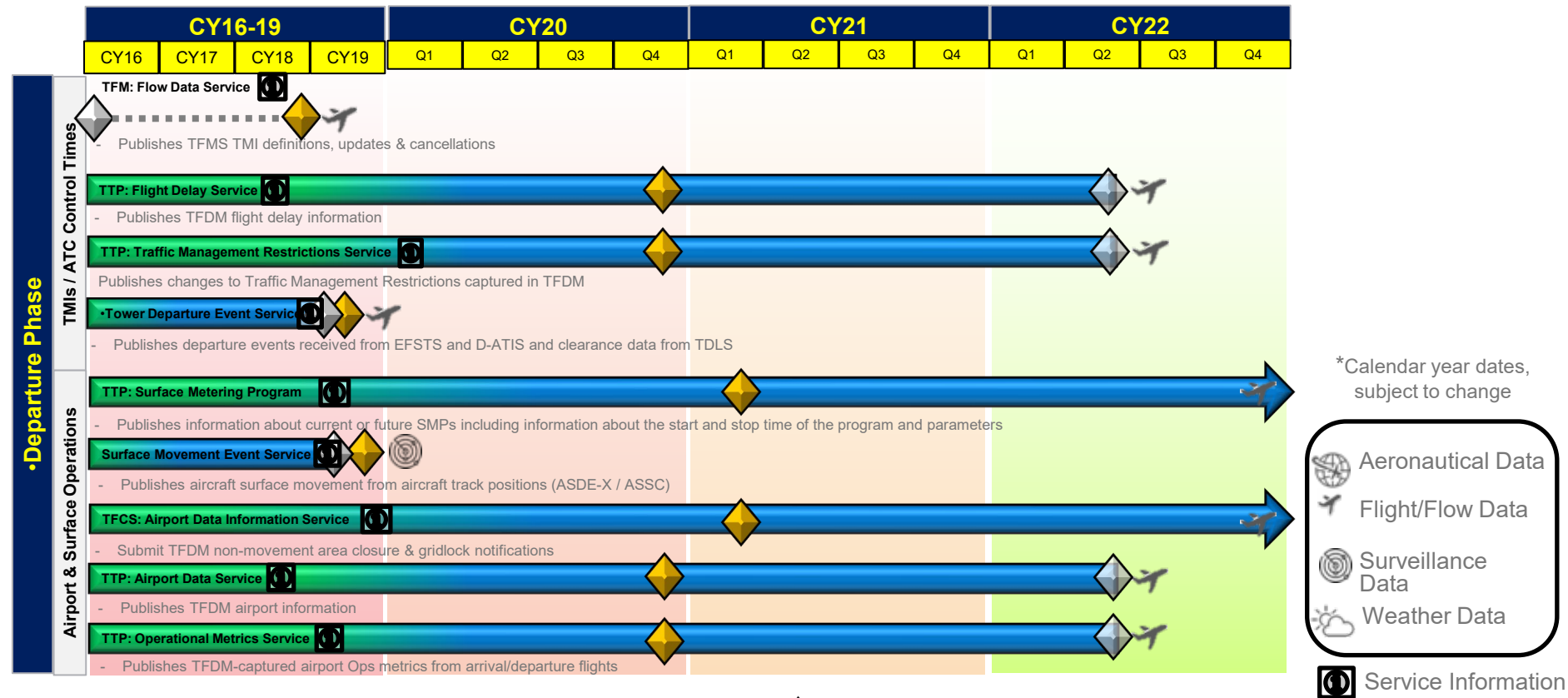
**Federal Aviation
Administration**



SWIM Services By Phase of Flight



SWIM Information Services Roadmap

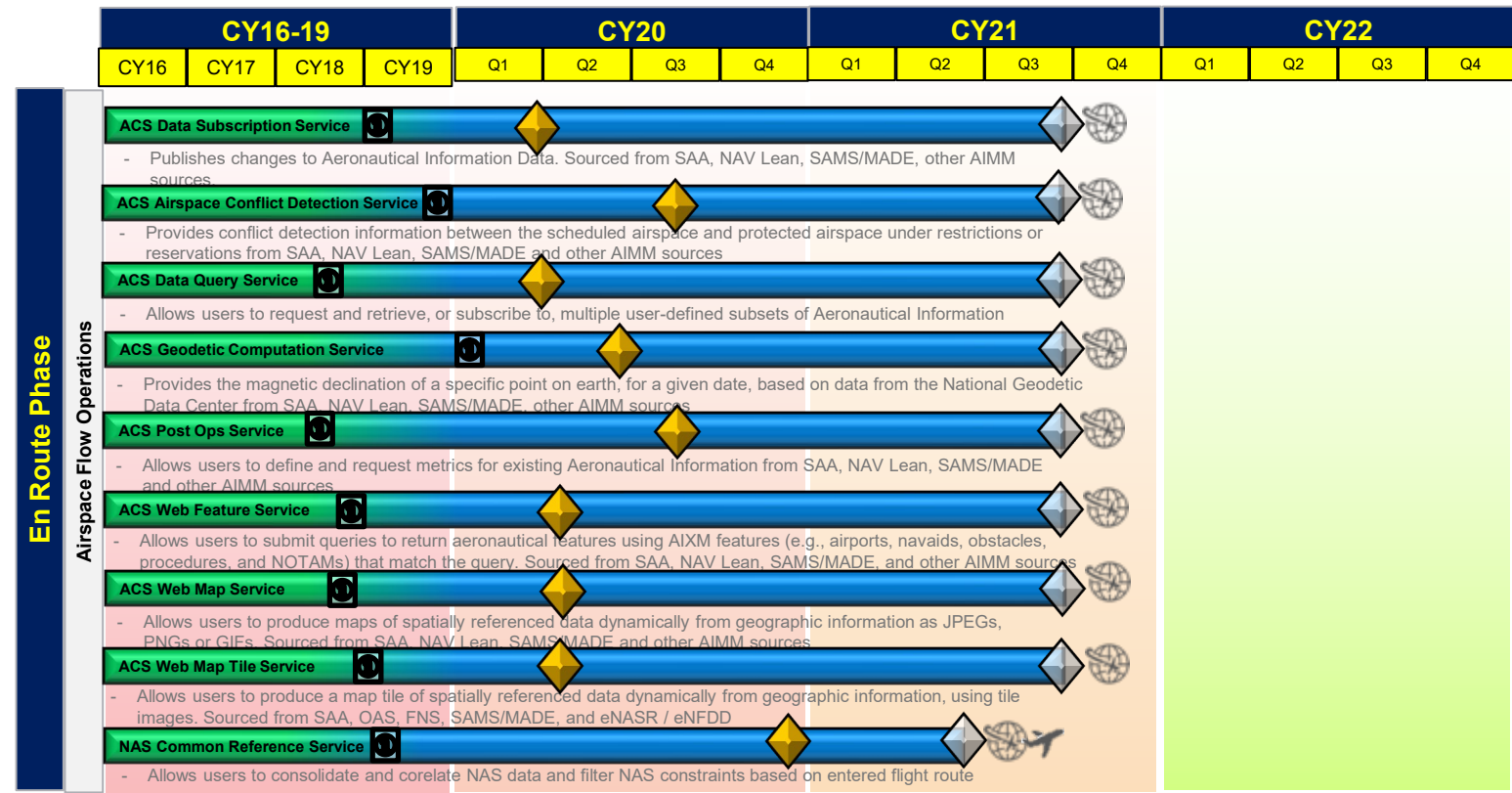


*Calendar year dates, subject to change

- Aeronautical Data
- Flight/Flow Data
- Surveillance Data
- Weather Data

Service Information

SWIM Information Services Roadmap



*Calendar year dates, subject to change

Aeronautical Data

Flight/Flow Data

Surveillance Data

Weather Data

Service Information

Final Announcements

#15 Virtual Workshop

- **Date**
 - **August 19th, 2021**
 - **12:30 - 4pm EST**
- **Location**
 - **Online Session**

SWIFT Site Information

SWIFT@faa.gov

- Any SWIFT-related questions
- Sign up for SWIFT mailing list

https://www.faa.gov/air_traffic/technology/swim/swift

- Register for future SWIFT meetings
- Stay up to date with SWIFT
- Past meeting slides



SWIFT Contact Information

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- Email: Stefanie.C.Calabrese@faa.gov
- Email: SWIFT@faa.gov

David Almeida, SWIFT Community Moderator

- Phone: (321) 735-2774
- Email: David.Almeida@LSTechLLC.com

SCAN ME



Back Up



SFPDS Airspace

SWIM Flight Data Publication Service (SFDPS)*: Provides flight data and updates to clients for filed and active flight plans

✓ Flight Plan information	✓ Tentative Aircraft identification Amendment Information
✓ Flight Amendment Information	✓ Tentative Flight Plan Removal
✓ Converted Route Information	✓ Tentative Flight Plan Amendment Information
✓ Cancellation Information	✓ Track Information
✓ Departure Information	✓ Drop Track Information
✓ Aircraft Identification Amendment Information	✓ Interim Altitude Information
✓ Hold Information	✓ Automated Radar Terminal System (ARTS) Flow Control Track/Full Data Block Information
✓ Progress Report Information	✓ Beacon Code Reassignment
✓ Flight Arrival Information	✓ Beacon Code Restricted
✓ Flight Plan Update Information	✓ Flight Plan Data Bank (FDB) Fourth Line Information
✓ Expected Departure Time Information	✓ Point Out Information
✓ Position Update Information	✓ Inbound Point Out Information
✓ Tentative Flight Plan Information	✓ Handoff Status

Airspace Data Publication Service*: Published by SFDPS

✓ Sector Assignment Status	✓ Special Activities Airspace (SAA)
✓ Route Status	✓ Altimeter Setting

Operational Data Publication Service*: Published by SFDPS

✓ Traffic Count Adjustment	✓ Beacon Code Utilization
✓ Instrument Approach Count Adjustment	✓ Geographic Beacon Code Utilization
✓ Sign In Sign Out	

General Information Message Publication Service*: Published by SFDPS

✓ General Information

ITWS Data Messages

Weather Data	
Integrated Terminal Weather System (ITWS) Data Publication: Provides specialized weather products in the terminal area	
✓ Configured Alerts	✓ Tornado Detections Wind Profile
✓ Forecast Accuracy	✓ Anomalous Propagation (AP) Indicated Precipitation
✓ Forecast Contour	✓ AP Status
✓ Forecast Image	✓ Gust Front Estimated Time to Impact
✓ Gust Front TRACON Map	✓ Hazard Text 5nm
✓ Microburst TRACON Map	✓ Hazard Text Long Range
✓ Precipitation 5nm	✓ Hazard Text TRACON
✓ Precipitation Long Range	✓ ITWS Status Information
✓ Precipitation TRACON	✓ Microburst Automatic Terminal Information Service (ATIS)
✓ Storm Motion (SM) Storm Extrapolated Positions (SEP) 5nm	✓ Runway Configuration
✓ SM SEP Long Range	✓ Storm Motion 5NM
✓ SM SEP TRACON	✓ Storm Motion TRACON
✓ Terminal Weather Text Normal	✓ Terminal Weather Text Special
✓ Tornado Alert	✓ Wind Shear ATIS

TTP Flight Delay Data

Data Element	Description	Importance to Stakeholders
Aircraft Departure Delay Start Time	The delay start time.	TFDM will provide information regarding TMI and delays, including the reason for the delay and the facility that it is attributed to it. Non-FAA Stakeholders can use this information for awareness of the impacts of NAS initiatives on individual flights. The information can also be used for flight planning purposes (crew planning, aircraft movement planning, etc.), making strategic and tactical coordination efforts with the FAA (e.g., Command Center for reroutes), and post-event analysis.
Aircraft Departure Delay End Time	The delay end time.	
Impacting Condition	The reason for the delay.	
TMI	The identified TMI cause, if applicable.	
Charge To	The facility the delay is attributed to.	
Remarks	Additional information to explain the conditions or causes associated with the delay.	

Flight Restrictions

- **Issue: The need to see real-time NAS restrictions at a glance**
- **Tool: Flight Restrictions Widget**
 - Real Time Restricted NAS elements
 - Yellow/Red filter
- **Dispatch Desk Example**
- **Benefits**
- **Enhancements**

SWIM
SWIM Tables
SWIM Charts
TBFM
AAR/ADR
Ticker

Note: This website and underlying code and data are intended for informational purposes only and should NOT be used for operational decision making.

FLIGHT RESTRICTIONS

Airports	Element	Restriction	Start	Stop	Exclusions	Reporting	Providers	Type	Action	Remarks
EWR	COATE	15 MIT	07/1800	08/0000		DCC	ZBW	ARR	MODIFY	(EWR/SATS = TEB, MMU, CO...
EWR	RBV	25 MIT	07/2240	08/0300		DCC	ZNY	ARR	INITIATE	VIA WRI
ALL	WAVEY	15 MIT	07/2145	08/0000	ZDC LTFC	DCC	N60	DEP	EXTEND	
ALL	WAVEY	15 MIT	07/2145	08/0000	ZDC LTFC	DCC	ZNY	ENR	EXTEND	
ALL	WAVEY	15 MIT	07/2145	08/0000	NORMAL EXCLUSIONS	N90	JFK	DEP	EXTEND	
ALL	WHITE	5 MINT	07/2025	08/0000	NORMAL	N90	TEB, REQ	DEP	EXTEND	
ALL	WHITE	7 MINT	07/2025	08/0000	NORMAL	N90	EWR	DEP	EXTEND	
ALL	WHITE	5 MINT	07/2025	08/0000	NORMAL	N90	LGA	DEP	EXTEND	
ALL	WHITE	10 MIT	07/2025	08/0000	ZDC LTFC	ZNY	N90	ENR	EXTEND	WORK INTO IT PLEASE
ALL	J174	30 MIT	07/2030	08/0000	ZDC LTFC	DCC	Z8W	ENR	EXTEND	STRAT A08 FL350/ADA
ALL	NGATES	15 MIT	07/2200	08/0030		DCC	N90	DEP	INITIATE	
ALL	NGATES	15 MIT	07/2200	08/0030		N90	JFK	DEP	INITIATE	
ALL	NGATES	5 MINT	07/2200	08/0030		N90	EWR, LGA	DEP	INITIATE	
ALL	NGATES	7 MINT	07/2200	08/0030		N90	HPN, TEB	DEP	INITIATE	

This table show the status of currently restricted NAS elements. These restrictions can include Miles in Trail (MIT), Minutes in Trail (MINT), or any other constraints placed on flights by Air Traffic Control.

EnRoute Fix Load

- **Issue: The need to see real-time NAS restrictions at a glance**
- **Tool: EnRoute Fix Load Widget**
 - Real Time Restricted NAS elements
 - Fix Crossing Time
- **Dispatch Desk Example**
- **Benefits**
- **Enhancements**

SWIM SWIM Tables SWIM Charts TBFM AAR/ADR Ticker

Note: This website and underlying code and data are intended for informational purposes only and should NOT be used for operational decision making

EnRoute Fix Load*

Fix Crossing Time						
Fix	Miles In Trail	Minutes In Trail	1000 - 1015	1016 - 1030	1031 - 1045	1046 - 1100
WAVEY		10	80	75	60	40
GAYEL	5		60	70	65	60
NEION			60	50	45	40
RBV	15		90	100	95	90
BIGGY	10		75	70	75	80
WHITE			50	40	45	50

*Notional Data)

This table presents current MIT and MINIT restrictions at specific fixes. The table presents fix loading projections for next hour from 0-100%, with 100% being fully allocated and no available capacity is left.