Minutes of the Federal Aviation Administration (FAA) SWIM Industry Collaboration Workshop – SWIM Industry-FAA Team (SWIFT) Meeting #8
November 7, 2019 (8:30am – 4pm)

Delta Airlines Training Center
1030 Delta Blvd, Hapeville, GA

1. **Introductions/Welcome**
   1.1. The meeting was held at the Delta Airlines Training Center, 1030 Delta Blvd, Hapeville, GA on Thursday, November 7, 2019 at 8:30am.
   1.2. The eighth meeting of the Federal Aviation Administration (FAA) – SWIM Industry-FAA Team (SWIFT) was called to order by David Almeida - SWIM SME and Strategist, LS Technologies.
   1.3. Representatives from multiple user groups were in attendance, including airlines, airline/government vendors, government, research organizations, airport/airspace authorities, and professional associations. See **Appendix A:** SWIFT #8 Attendees for the full list of attendees.
   1.4. Opening remarks; thank you and welcome
       1.4.1. Mark Hopkins – Director Air Traffic Management, Delta Airlines
       1.4.2. Felisa White – SWIFT Chair, FAA
       1.4.3. Joshua Gustin – SWIFT Sponsor, FAA
       1.4.4. Rob Goldman –SWIFT advisor, Delta Airlines
   1.5. Introduction of first time attendees
   1.6. Overview of agenda, review of SWIFT activities and 2019 year in review
   1.7. Congratulations to the FAA SWIFT team for winning the 2019 Pinnacle Award: Project of the Year by WashingtonExec
2. **What's Next: Look Ahead to 2020**
   2.1. 17 items were identified during SWIFT #7 on Aug 8, 2019 in Denver
   2.2. These items were assessed and will be addressed by the SWIFT
   2.3. Ways to address these items were categorized as:
       2.3.1. Part of SWIFT 2020 planning
       2.3.2. Following up Actions items
       2.3.3. Establishment of a Focus Group
3. **Special Topic: Delta Airlines – SWIMming in Gate Returns**
   3.1. Bill Tuck – Operations, Roger Jones – IT, Erin Cobbett – Data Analytics
   3.2. Delta has ingested FAA data for use in operational tools for a long time
   3.3. Many sources exist (Legacy TFMS, TBFM, NADIN)
   3.4. The TBFM STD was the first consumed SWIM element and took over a year to complete
   3.5. Required TFDM elements took multiple iterations and considerable time/ resources to get right
   3.6. SWIM is the largest and most complex data source ever brought into Delta
   3.7. SWIM is an opportunity to have a single source of FAA data and create a sustainable process

3.8. Our Digital Transformation program has created a new Enterprise operations infrastructure

3.9. Our SWIM team has representatives from Operations, Analytics, IT, and ATM

3.10. FAA Advanced Planning Team (PERTI) joined stakeholders in finding improvement opportunities during Summer '19

3.11. SET worked to develop goals that represent industry objectives

    3.11.1. Driving throughput, timely issuance of routes, developing exit strategies, fewer Gate Returns

3.12. Gate Return goal encountered some FAA opposition

    3.12.1. No ability to monitor in real time

    3.12.2. Quality Control (QC) cannot pull yesterday's data to evaluate

    3.12.3. No easy way to get Flight Operator data into FAA system

3.13. Team agreed to provide data prior to the NSR

3.14. Gate Returns are extremely impactful

3.15. Many carriers have in-house tools to monitor lengthy taxi times

3.16. However, FAA lacks a real-time monitor

3.17. SWIM can enable both FAA and Delta to improve aid in prevention and recovery of Gate Return scenarios

3.18. Wanted to work with a partner skilled in fast prototyping and agile projects

3.19. Engaged MITRE to help create the POC

3.20. <u>POC Roles</u>

    3.20.1. Delta: Provide use case and internal data

    3.20.2. MITRE: Build prototype

3.21. Gate Return Monitor

    3.21.1. ASDE-X (*STDDS-SMES*) provides track and detects the Return

    3.21.2. Combine with other details (*TFMS Flight*) and calculations

3.22. Lessons

    3.22.1. Thought this was a simple ask, turned out to be more interesting and difficult

        3.22.1.1. More fuel for the agile fire

        3.22.1.2. Thinking through the visualization sparked more questions

    3.22.2. Due to internal Delta security unrelated to the SWIM connection, the SCDS connection process took longer than expected

    3.22.3. Learned what an experienced, dedicated, and data ready team can do

        3.22.3.1. Use case definition to POC in 10 weeks

3.23. Next Steps

    3.23.1. Real-time monitoring is only the first step

    3.23.2. Continue development by adding features

        3.23.2.1. RAPT Fix Closures

        3.23.2.2. MIT

        3.23.2.3. Flight route history

    3.23.3. Store data to develop alerts

    3.23.4. Industry support to push into the NOD

4. SWIFT Focus Group: Operational Context & Use Case Documents

4.1. Jay Zimmer – Systems Engineer, LS Technologies

4.2. Operational context - how the FAA uses data.
    4.2.1. Since last SWIFT:
        4.2.1.1. Finalized – SFDPS General, STDDS ISMC
        4.2.1.2. Drafted – TFMS Request/Reply, SFDPS Airspace Data Query
4.3. Use case - grouped services by domain (flight/flow, weather, surveillance, status, aeronautical) - how through each phase you have better options available to you.
4.4. Next Steps
    4.4.1. Awaiting feedback on:
        4.4.1.1. TFMData Request/Reply
        4.4.1.2. SFDPS Airspace Data Query Operational Context
    4.4.2. In development:
        4.4.2.1. SFDPS Airspace Flight Query Operational Context
    4.4.3. Harmonizing Operational Context Documents
        4.4.3.1. Continue to retroactively update older documents to new template (TFMS Flight)
        4.4.3.2. Continue to retroactively update older documents as they are reviewed by producer programs
4.5. SWIFT Operational Context and Use Case documents can be found at: https://nsrr.faa.gov/library
4.6. For more information contact: Jay Zimmer, SWIFT Focus Group Lead
    4.6.1. Email: jay.zimmer@lstechllc.com
4.7. In addition to the NSRR, all SWIFT Documentation can also be found at:
4.8. https://connect.lstechllc.com/index.cfm/main/swifthome

5. SWIM Producer: Traffic Flow Management System (TFMS) - TFMData R14 and R13 Updates
5.1. Chris Burdick – Systems Engineer, TFMS Program, FAA
5.2. TFMS Release 14 Scope and Impacts
    5.2.1. New Surface Viewer (SV) application for FAA users at Towers, TRACONs, ARTCCs, and the Command Center by October of 2020
        5.2.1.1. The SV displays real-time airport information, TFDM data, and surface movement on airport maps at 44 ASDE-X/ASSC equipped airports
        5.2.1.2. The SV will enhance ATC situation awareness and begin to enable real-world benefits of TFDM
    5.2.2. User Transition
        5.2.2.1. All existing inbound and outbound business functions and queues will remain at v2.0.5
        5.2.2.2. Users may contact their SWIM representatives to begin on-ramping to v3.1 in the FAA Test Environment by January 2020.
        5.2.2.3. FAA will support v.2.0.5 through March 1, 2021
    5.2.3. Download Package and SWIM Routing Changes
        5.2.3.1. TFMData v3.1 is now available for download from the NSRR
            5.2.3.1.1. Download package includes:
            5.2.3.1.2. JMSDD (JAVA Message Services Description Document)
            5.2.3.1.3. XSD (XML Schema Definition) files

5.2.3.1.4. README file

5.2.3.1.5. Sample messages are found here:

5.2.3.1.6. https://cdm.fly.faa.gov/?page_id=2287 (refer to slide 16)

5.2.3.2. TFMData v3.1 SWIM Routing Changes:

5.2.3.2.1. Users <u>must</u> include new JMS Property SchemaVersion=3.1 for REQ & IDP messages sent to TFMS

5.2.3.2.2. Users may choose to route upon new 'major' property to receive data pertaining to affiliated regional carriers.

5.2.4. JMSDD/Schema Change

5.2.4.1. The TFMData v3.0/v3.1 JMSDD Appendix D1 and D2 document the change history from 2.0.5

5.2.4.1.1. There are approximately 90 changes to the TFMData Service

5.2.4.1.1.1. Changes range from document annotations and editorial fixes to type and element changes

5.2.4.2. High Interest Release 14 Changes – Problems users reported

5.2.4.2.1. replyOption – Request/Reply's FDBLOCK

5.2.4.2.1.1. Optional in the schema but required by TFMS SW

5.2.4.2.1.2. SW was updated to now default to no-reply if the user does not specify the replyOption

5.2.4.2.2. Aircraft ID – Flight Data, Flow Information, Request/Reply

5.2.4.2.2.1. Changed to [A-Z0-9]{1,7}

5.2.4.2.3. Aircraft Registration Mark – Request/Reply

5.2.4.2.3.1. Changed to [A-Z0-9]{1,7}

5.2.4.2.4. ETD Type METERED in Flight Data is now being set

5.2.4.2.5. TIME_OUT_DELAY (ADL param LTOD) in Flow Information is now populated

5.2.4.2.6. ncsmControlDataType – FlightData

5.2.4.2.6.1. New element added to identify the control program type AFP, GDP, GS, CTOP

5.2.4.3. High Interest Release 14 Changes – New Content

5.2.4.3.1. Added new element restrictionCategory – FlowInformation

5.2.4.3.1.1. TFMS now sends APREQ notifications

5.3. Common Stumbling Blocks and Lessons Learned

5.3.1. Users must test and certify their applications with the FAA prior to deploying to Operations

5.3.2. The rules in the AOCNET/CDMNET, and FOS ICDs apply to the associated requests in TFMData

5.3.3. TFMData Request/Reply User ID coordination (commonly 'center' code)

5.3.3.1. Users must use the same ID for both TFMS and NEMS

5.3.4. When a user sends an FDBLOCK request without the replyOption the request would previously be dropped

5.3.4.1. SW was updated to default to no-reply if the replyOption is not present

5.3.5. Users were not clear what JMS properties were required

5.3.5.1. The v3.1 JMSDD now includes a required column for all inbound JMS properties

5.3.6. When a Request/Reply JMS Property is included that also exists as a message attribute, they must match each other

5.3.7. It is recommended that functions be designed to use one or the other interface

5.3.7.1. TFMData vs. Legacy

5.3.7.2. Messages cannot be duplicated across both interfaces

5.3.8. If using both interfaces, extreme care must be taken - especially if there are two separate applications using the two interfaces

5.3.9. Retries should be no faster than 2 minutes (up to three times is normal)

5.3.10. Validate XML messages before sending them

5.3.11. Set the UUID in Request/Reply interface to a unique value for each message sent including retries

5.3.12. Use ICAO formatted Call Signs

5.3.13. The IGTD time should not be modified unless absolutely necessary because it is used to match flights in TFMS

5.3.14. To support Flight Matching the following fields are required

5.3.14.1. Call Sign, Departure Airport, Arrival Airport, IGTD

5.3.15. flightCreate should not be sent for an active/existing flights

5.3.16. flightCreate required fields

5.3.16.1. gateArrivalTime (AIMS177569/CR45911)

5.3.16.2. gateDepartureTime (AIMS177569/CR45911)

5.3.17. The arrival airport cannot be changed prior to departure

5.3.18. Rules regarding Flight Times

5.3.18.1. Departure time must be before arrival time (this has happened!)

5.3.18.2. Actual Times must be in the past, TFMS allows a small 5 min window

5.3.18.3. If modifying runway estimated departure/arrival times, the estimated time en route (arrival time - departure time) must be within:

5.3.18.3.1. A minimum change factor of 0.6, A maximum change factor of 1.4

5.3.19. ALL Times should be in ZULU and should be accurate (all times are very important)

5.3.20. Paired Fields

5.3.20.1. runwayDepartureTime & runwayArrivalTime

5.3.20.2. gateDepartureTime & gateArrivalTime

5.3.20.3. actualRunwayDepartureTime & actualRunwayArrivalTime

5.3.20.4. actualGateDepartureTime & actualGateArrivalTime

5.3.20.5. For diversion, if originalFlightIdentification is included, you must also include originalUTCDepartureDateTime (and vice-versa)

5.4. TFMData Release 13 Patch 18 Changes

5.4.1. TFMData Airport Monitor responses do not include sequences

5.4.1.1. Added seqNumber and maxSequenceNumber as JMS Properties to the ARPTM Responses

5.4.2. TFMData Airport Monitor limits initial flight list to requesting airline

5.4.2.1. Changed Airport Monitor responses to include all flights

5.4.3. TFMData FDBLOCK requests do not authorize properly – more than one user ID should be allowed for an airline

    5.4.3.1. Request/Reply authorization logic was changed to use LDAP where it looks up user authorizations that are configured based on FAA and Airline authorization

5.4.4. TFMData Airport Monitor limits flight list updates to requesting airline

    5.4.4.1. Changed Airport Monitor updates to include all flights

5.4.5. tmiFlightDataList messages do not set hasMinitoredDepApt or hasMonitoredArrApt

    5.4.5.1. Updated FlowInformation publication service to include hasMinitoredDepApt and hasMonitoredArrApt

5.5. TFMS Technical Webinar

  5.5.1. **Every Second Thursday of the month.**

  5.5.2. **Next TELCON Nov 14th, 2019 1:00ET**

  5.5.3. Register ahead of time to receive the bridge number and passcode

  5.5.4. Send questions or advance TELCON topics

    5.5.4.1. Chris.Burdick@faa.gov and/or Thomas.ctr.Paccione@faa.gov

6. **Special Topic: JetBlue EDCT/D-ATIS POC**

6.1. Chris Gottlieb – IT, JetBlue

6.2. Current State

  6.2.1. Spotfire reports, File copying

  6.2.2. EDCTs are received through a business partner and are received into our Flight Domain Database.

  6.2.3. Flight Domain - EDCTS are received then relayed to various JetBlue Products.

  6.2.4. Movement System - Is the system of record for JB. Delays are received and published in Movement Control.

  6.2.5. EDCT Dashboard - Dashboard receives EDCTS from Flight Domain and edits made by crewmembers from our Movement System

  6.2.6. Benefits

    6.2.6.1. Common situational display between workgroups.

    6.2.6.2. Real Situational Awareness for Crew Legality Issues.

    6.2.6.3. Yields quicker Crew Replacements.

    6.2.6.4. Reduces risk of real time cancels.

6.3. Moving from vendor provided EDCTS sent via email to Ops personnel to SWIM-derived published into EDCT dashboard.

  6.3.1. Return on investment is based on crew member time and efficiency. Look everything up at 1 place, before you had to make calls, look at emails, etc. This is an easy business case because it improves workflow. If you don't know EDCT or Must Off Time (MOT) it's an 8 minute phone call of wasted time. The earlier you can go know when the crew will time out the better. Database approved in to JBU 2020 budget

6.4. Available Filters

  6.4.1. Region, Flight, Departure City, Arrival City

6.5. Displayed Fields

  6.5.1. Status, STD/ETD, EDCT, MOT, Flight Number

 6.6. Future State

  6.6.1. SWIM Data, More Consumed Data Fields, EOBT

  6.6.2. SWIM Data - Data received from the FAA.

  6.6.3. SWIM Database - JetBlue Hosted database to house SWIM Data

  6.6.4. Delays Dashboard (GS,GDP,AFP,Metering) - Delay Dashboard would encompass increased sets of data , increasing our ability to make critical real time decisions.

  6.6.5. Benefits

   6.6.5.1. Visibility into all Controlled Times.

   6.6.5.2. Visibility into Metering Times.

   6.6.5.3. Recording of FAA delays in single database could be used by multiple analysis teams

 6.7. JBU has had issues with snowstorms in NE. Wanted to look at D-ATIS to develop a throughput diagram with METARS, wind, etc. Find out how well we do with departures under certain conditions. Want to have plans x hours out with D-ATIS next to it to help show how plan should change based on changing forecast

 6.8. D-ATIS POC

  6.8.1. Ingest Data to improve internal Airport throughput, equipment and Block Times

  6.8.2. Winds, Visibility, Runways in use, Precipitation Intensity, Precipitation type

  6.8.3. D-ATIS Elements -> JBU SWIM Database ->JBU Department Utilizations

   6.8.3.1. System Ops - Supports Real Time Decisions

   6.8.3.2. Airport Ops - Reassess Airport Throughput

   6.8.3.3. Ops Performance and Analysis - Crucial Data to Improve IROPS and equipment

7. Enhanced SWIM Cloud Service

 7.1. Joshua Gustin – CINP group manager, FAA

 7.2. SWIM Cloud Distribution Service (SCDS) has been a success. Deployment of SCDS was extremely fast. Adoption rate has been fast as well. Airlines were resistant to cloud until they saw the development possibilities. Enhanced SWIM Cloud Service (ESCS) has to be more than just a SCDS for ops. ESCS may include international. Think of this as a cut/paste of SCDS plus more. If we have a need for a testbed (FNTB) we can cut/paste that so it doesn't disrupt what's already connected. We can also deploy in current SCDS.

 7.3. What does model look like for the future? Do we need environment in the cloud for R&D test? True agile/development operations environment. Separate your thinking from SCDS that we built as step 1, to all other things coming that may or may not be part of that SCDS. You will have to be authorized for it.

SWIFT Update: Aeronautical Common Services (ACS)

 7.4. Suzanne Koppanen - AIMM S2 Program Manager, FAA

 7.5. Davy Andrew - AIMM S2 Program Manager, FAA

 7.6. Three phases planned for Aeronautical Information Management Modernization (AIMM)

 7.7. Aeronautical information delivered as data instead of products

 7.8. AIMM S1

7.8.1. Established FNS

7.8.2. Improved airspace reservation system

7.9. AIMM S2

7.9.1. Implements Aeronautical Common Service

7.9.2. Distribute Aeronautical Data over SWIM

7.10. AIMM E1

7.10.1. FNS improvements

7.10.2. Airspace tool

7.10.3. Improved ACS Queries

7.11. ACS Web Services

7.11.1. Users have the ability to query Aeronautical Information through the ACS

7.11.2. ACS currently provides eight different web services (nsrr.faa.gov):

7.11.3. Web Feature Service, Data Query Service, Data Subscription Service, Web Map Service, Web Map Tile Service, Airspace Conflict Detection, Geodetic Computation, Post Operational Metrics

7.12. ACS Consumer Testbed (ACT)

7.12.1. Created in the SWIM R&D domain

7.12.1.1. Stakeholders get an early access to available ACS data, functionality and SWIM onboarding processes

7.12.1.2. Familiarization with the integrated aeronautical data environment

7.12.2. The ACT will provide users the ability to:

7.12.2.1. Develop and test functionality, and capability of ACS

7.12.2.2. Interact with and understand the aeronautical information available through the ACS

7.12.3. ACT 1

7.12.3.1. Ready for users now

7.12.3.1.1. Working with STDDS and other FAA Stakeholders

7.12.3.2. Complete static data set

7.12.3.3. 8 Web Services available to query data set

7.12.3.3.1. Data Subscription Web Service available by request only

7.12.3.3.2. ACT Team will coordinate with stakeholders to generate changes to trigger service

7.12.3.4. Steps needed to use ACT 1:

7.12.3.4.1. Become a SWIM Consumer

7.12.3.4.2. On-ramping credentials from NEMS

7.12.3.4.3. Coordination with ACT Team

7.12.4. ACT2

7.12.4.1. Ready by Spring 2020

7.12.4.2. Operational data

7.12.4.3. Stakeholder load testing

7.12.4.4. All 8 Web Services will be available to query data

7.13. For Technical and Programmatic Questions email: ACSConsumer@FAA.gov

8. **Special Topic: National Business Aviation Association (NBAA) Case Study: Refining Airspace Restrictions with SWIM – Update**

8.1. Ernie Stellings – NBAA

8.2. Jay Zimmer – Systems Engineer, LS Technologies

8.3. Many NBAA operators are caught in Airspace Flow Programs (AFP) when they are overflying areas with no plans to descend, so they receive unnecessary restrictions

8.4. Common in ZJX on southbound flights to Caribbean, ZOB/ZNY on eastbound flights to New England

8.5. No clear tools available to help traffic managers determine if overflights should be captured in AFP initiatives when landing in more distant areas than the constrained area

8.6. Goals
    8.6.1. Use SWIM data to resolve how common it is for overflights to be caught in AFPs and unnecessarily delayed
    8.6.2. Use CDM processes to make ZNY aware of the issue and see if it can be ameliorated

8.7. Methodology
    8.7.1. Develop widget to ingest SWIM data to provide insights
    8.7.2. Record flight data for days with ZOB/ZNY AFPs
    8.7.3. Identify flights that do not descend in ZOB/ZNY
    8.7.4. Analyze route strings/altitudes to identify the where 'non-descending' flights operate

8.8. Development Issues
    8.8.1. Development did not go as planned due to various reasons – unable to correlate certain messages, no ZNY AFPs issued once correct messages were consumed.
    8.8.2. TMI Flight List did not include the name of the TMI the list is for, unable to use list
    8.8.3. Will revisit this message to see if there are alternate ways to correlate the messages
    8.8.4. Fuel Advisory Delay Table (FADT) lists unscheduled flights affected by a TMI, this message does include the name of the TMI, used this list instead
    8.8.5. Due to development delays, did not start ingesting FADT until September – after severe weather season in Northeast ended
    8.8.6. Include flight lists for other TMIs (e.g., ground stops, ground delay programs, etc.)
    8.8.7. Reassess data Spring/Summer 2020 during severe weather season

9. **Special Topic: MITRE Air Traffic Demonstration (ATD) 2 Phase 3 General Aviation Participation in TFDM Surface Scheduling Mobile Applications for the Surface**

9.1. Paul Diffenderfer - Principal ATM Advisor, MITRE

9.2. Kevin Long – Lead Human Centered Engineer, MITRE

9.3. MITRE lives in a research world, need to bring value to the NAS as a whole, there are companies that need to bring value to their clients, need to bridge that gap.

9.4. TFDM will be at 89 airports, there will be a surface scheduling component of that. Will shift delay to surface areas without engines running. Earlier, more accurate times can

do prescheduling of release time. Timing of traffic flow management becomes more important.

9.5. Airlines keep times based on various factors – ticket scans, baggage door closure, etc. GA/BA does not have those capabilities.

9.6. GA/BA uses mobile apps for navigation – Foreflight, Flightplan etc. There is an opportunity to get GA/BA information if we use these mobile capabilities

9.7. EOBT - how do we engage with GA, who don't think about this time? They file flight plan for departure time, then don't provide updates. Who sits in middle to provide data? Could capability like this be added to Foreflight (or something similar)? Model for airlines is that there is a central authoritative source for when flights would be ready.

9.8. Issues with corporate policies installing apps on EFBs/mobiles so we transitioned to text messages. Users can text a time then get data back via text messages. Work in LAS added a progressive web application – feels like an app but it's just a mobile web site.

9.9. Pacer at LAS, Dallas Love, Henderson Executive airport (Vegas). Multiple user interfaces – pilots, Ops Center/FBO, Traffic Mangers

9.10.   Pulling TFMS and SFDPS using SCDS. Data is merged. Set of hierarchical rules that gives higher priority to times that are closer to the aircraft – e.g. time from pilot weighted higher than schedule data.

9.11.   Live Demo of PACER webapp

9.12.   Flight Object – how did you create yours?

    9.12.1. Our representation of a single flight – pulling data from the 3 data sources. Using origin/destination/route string to fuse that data. Issues with fusing schedule data with real time data, code share, relation to real-time data feeds. Definition of certain times, who is providing them, are there different data fields and how they are populating them.

9.13.   plan was not to build a reservation system; plan was to build a crowdsourced tool to show what overall picture looks like. In the future this data will come from the pilots in TFDM

9.14.   Q: How does continuously changing impact operations?

    9.14.1. Must be stabilizing rules. Middle person might have to throttle to so many updates in a period of time.

9.15.   Q: The airlines - there is a senses of stability. Do you have that sensitivity of how much GA makes difference? One pilot doing this doesn't feel like it makes a difference. Is there a breakpoint?

9.16.   We didn't look at threshold. At CLT/ATL, it's trivial amount of GA. But go to LAS and it's more than 10-15%, you could have a big chunk you don't have arrival data for. You could impact schedule.

10. **SWIFT Topic: Introducing new Focus Groups**

10.1.   Jay Zimmer – Systems Engineer, LS Technologies

10.2.   Many issues arise at SWIFT meetings do not get resolved by existing focus groups

10.2.1. SWIFT has presented multiple case studies with proposed solutions that have either been not fully solved or implemented

10.2.2. Multiple requests for instructions how to build widgets, requests for help building capabilities with SWIM feeds, etc.

10.3.   Operational Focus Group

10.3.1. Goal: Address NAS-wide issues that are raised at the SWIFT that we never fully resolve

10.3.2. Taxi-out return to gate, TBFM/TFMS interaction issues, Flight planning over IP, etc.

10.3.3. Requires input from other NAS programs/SMEs, focus group alone cannot solve these problems, but it can identify the main problems to bring up with other programs

10.4.   Development/Analytics Focus Group

10.4.1. Democratize the widget building process

10.4.2. Get input from focus group members about what problems they want to solve or capabilities they want to build/replace with SWIM

10.4.3. Previously SWIFT leadership would develop an idea and build a widget, not necessarily starting with an operational problem the group wants to solve first

10.4.4. NBAA AFP widget is a step in the right direction, but only developed for 1 stakeholder

10.4.5. Avoid requests for sharing code and teach users how to develop these capabilities on their own

10.4.6. Move away from "widgets" and start building "instruction manuals" for SWIM-enabled capabilities that are technology agnostic

10.5.   Operational Issues focus group - identify systematic problems and identify solutions. Feed this to Development and Analytics Focus Group.

10.6.   Operational Issues Focus Group - document template includes operational problem, NAS systems, proposed solutions, outcomes.

10.7.   Define and refine the problem, make sure there is a loop back. If its data driven problem, move forward to development/analytics focus group. If not, goes to another group (CDM, etc.) We want to make sure we're defining problems meaningful to you as a community. We want to make sure they're data driven. Consider it SWIFT Open Source community software that sparks ideas for this group.

10.8.   Forming phase. Next is storming. Idea being that this is a huge group. To me, key to these groups is leadership. Suggesting that Erin do the storming. It's a blank slate. We need membership to that team. We need help with analytics. This is about you guys helping, not just coming in to come in and listen to us.

10.9.   Chris Gottlieb from JetBlue volunteers to lead operational issues focus group.

10.10.   Erin Cobbett from Delta volunteers to lead Analytics/Development focus group.

10.11.   From FAA perspective, I can't hear one voice. I can hear a group loudly though. Being part of this makes your voice heard.

10.12. Q: Been success with agile project development, core tenant is building working prototype. Thoughts?

10.13. I agree. Reason I didn't want to focus on development side, different for everyone. Logic works for everyone.

10.14. That's a part of storming.

10.15. Establishing a charter. We do have concept of developing prototypes.

10.16. Notion of rapid prototyping and bringing things quicker to market. We need prototypes fast. We think these focus groups can generate that churn. Focus has to be on action.

10.17. Security policies to work through for airlines for cloud - do we need to work through that? Over time, there will be synergy with two groups.

10.18. This is not made to work in your environment, but it can start as a point of reference. You look at it and apply it in some fashion.

10.19. Process can change too. Won't find out if it doesn't work until we try something.

11. **SWIM Capability: National Airspace System Common Reference (NCR)**

11.1. Damon Thomas – SWIM Implementation Lead, FAA

11.2. Mark Strout - NCR Development Team Lead, DOT Volpe Center

11.3. Less than year away from IOC. Goes into production next summer. A lot of shortcomings that drove NCR capability - filtering, deriving geospatial and temporal elements (i.e. NOTAMs), coordinate reference systems that aren't consistent across SWIM services.

11.4. NCR concept around since 2011, but shortfalls still exist.

11.5. A longstanding SWIM mission has been to deliver the right information, to the right users, at the right time

11.6. NCR addresses several obstacles to achieving this mission:

11.6.1. Filtering capabilities are implemented by each SWIM producer and can widely vary

11.6.2. Deriving geospatial and temporal elements from various message types can be complex and resource-intensive

11.6.3. Coordinate reference systems are not consistent across SWIM publication services

11.7. Consequently, SWIM consumers might:

11.7.1. Receive more data than is needed

11.7.2. Develop redundant or inconsistent functionality for processing and using consumed data

11.7.3. Lack the resources (expertise, automation, or otherwise) to fully process certain data types or messages

11.8. NCR Service Concept

11.8.1. An enterprise capability for enabling access to data published by multiple SWIM producers with a single request ("query")

11.8.2. Provides flexible and standards-based combinations of geospatial, temporal, and attribute filters for customizing queries

11.8.3. Supports two main query types: route and general

- 11.8.3.1. <u>Route</u>: give me all GDPs, Reroutes, Active SAAs, METARs, and PIREPs that overlap my route of flight with ETD 1500z and ETA 1800z
- 11.8.3.2. <u>General</u>: give me all GDPs, Reroutes, Active SAAs, METARs, and PIREPs within ZTL airspace effective at any point during 1500z-1800z inclusive
- 11.8.4. Supports one-time requests as well as subscriptions
- 11.9. Use Case
  - 11.9.1. NCR Concept of Use (ConUse) was written in 2013, and included detailed scenarios on notional uses by the operational community
    - 11.9.1.1. Scenarios developed by FAA AJV-7 with SME input from CDM Future Concepts Team (FCT)
  - 11.9.2. Additional enterprise use cases have emerged since then (e.g., CSS-FD, E-IDS), but also worth revisiting original scenarios for thinking at the time
- 11.10. NCR Service Concept
  - 11.10.1. Fundamentally, NCR *is*:
    - 11.10.1.1. A real-time service for planning and/or situational awareness
    - 11.10.1.2. A GIS-enabled database
    - 11.10.1.3. Stores parsed SWIM messages in common (1) format, (2) units of measure, and (3) coordinate reference system
    - 11.10.1.4. A geospatial server
    - 11.10.1.5. Processes user requests and extracts matching data from GIS-enabled database
  - 11.10.2. NCR *is not*:
    - 11.10.2.1. A decision-support service (e.g., it will not recommend alternate routes that avoid intersections with potential constraints)
    - 11.10.2.2. An authoritative data source
    - 11.10.2.3. A SWIM data visualization tool
    - 11.10.2.4. A historical database
- 11.11. NCR Release 1.0
  - 11.11.1. IOC scheduled for Summer 2020; In-Service Decision for Fall 2020
    - 11.11.1.1. Will be available to both Internal NAS and Non-NAS consumers
  - 11.11.2. Select data types from SWIM traffic flow, terminal, weather, and aeronautical services will be available
    - 11.11.2.1. 39 total message types across 4 SWIM producer services
    - 11.11.2.2. Flight-specific data <u>not</u> in scope (i.e., only RVR data from STDDS)
  - 11.11.3. Known Limitations / Design Decisions for Release 1.0
    - 11.11.3.1. Data sources & message types (workarounds for aeronautical & weather data)
    - 11.11.3.2. Trajectory model
    - 11.11.3.3. Route query – constraint intersection locations/times
- 11.12. NCR is consumer and producer of data.
- 11.13. Not available via SWIM Cloud yet.
- 11.14. Q: There's also TFM request reply - how does NCR leverage?
  - 11.14.1. Mark: Not using functionality.
- 11.15. Q: Subscription?

11.15.1.　　　NCR crosses multiple functions. TFMS request reply is for specialized stuff, less for this type.

11.16.　　Q: What can user filter?

11.16.1.　　　OGC filter and coding specification so whatever properties are exposed to user they can filter.

11.17.　　Q: 3-5 people sign up - what does sign up look like? Is there a data release part of this? Or NEMS topic? What is expectation?

11.17.1.　　　No data release required for testing. This data going outside of NAS, but for testing no. Looking for airlines external users to take part. Don't know who has been identified yet.

11.18.　　Q: If I was interested in certain airspace for certain time, current and future data, I could map out. It's four dimensions of geometrical data that can give insight into what's going to happen to operation based on these systems.

11.18.1.　　　Forecast evolving in time.

11.18.2.　　　After OT testing, we're looking to take this to board in February.

11.19.　　Q: We have heard that we get a lot of data when you get SWIM. Can this help pair down?

11.19.1.　　　Certainly, one of the tools.

11.20.　　Q: When will NCR be available to SWIM consumers?

11.20.1.　　　SWIM Program Office will begin to on-ramp initial set of users (tentatively ~3-5 users) upon NCR entering production, with wider availability to follow; timetable is TBD.

11.21.　　Q: Will a starter kit be made available as part of the on-ramping process?

11.21.1.　　　Yes, to tentatively include some tools used in development & testing.

11.22.　　Q: Will NCR be available via the SWIM Cloud?

11.22.1.　　　Not as part of Release 1.0, though formal discussions have begun with respect to future releases.

11.23.　　Q: How can I express interest in being an early NCR user?

11.23.1.　　　Contact Acting SWIM Program Manager Melissa Matthews (Melissa.Matthews@faa.gov) and SWIM Implementation Lead Damon Thomas (Damon.Thomas@faa.gov)

11.24.　　NCR ConOps, Draft JMSDD, and Draft WSDDs (4) are now available on NSRR

11.25.　　Future SWIM User Forums & SWIFT Meetings

11.26.　　Program Contacts

11.26.1.　　　Damon Thomas (FAA SWIM Implementation Lead): Damon.Thomas@faa.gov

11.26.2.　　　Ramesh Ravella (NCR Program Support): Ramesh.Ravella@noblis.org

11.26.3.　　　Mark Strout (Volpe Development Team Lead): Mark.Strout@dot.gov

12. Closing

12.1.　　Thanks all for attending, may look at modifying future SWIFT agendas:

12.1.1. For new folks we'll have a webinar for what we've done over last 2 years. We will send out email with more information.

12.2.　　May plan sessions that are interactive in morning. Expect to see email to organize focus groups. Going on trajectory, but doesn't mean we're stuck in it.

Pragmatism will rule the day. End of day, this doesn't' solve problems, then we aren't doing our job. Get your voice heard.

12.3.   SWIFT Workshop #9 will be February 26, 2020

12.4.   Location: FedEx Headquarters - Memphis, TN

12.5.   SWIFT Contact Information

    12.5.1. Joshua Gustin, SWIFT Sponsor & Group Manager

        12.5.1.1.   Communications, Information & Network Programs

    12.5.2.   Email: Joshua.Gustin@faa.gov

    12.5.3. Felisa White, SWIFT Chair & FAA Lead

        12.5.3.1.   Phone: (202) 267-7994

        12.5.3.2.   Email: Felisa.White@faa.gov

        12.5.3.3.   Email: SWIFT@faa.gov

    12.5.4. David Almeida, SWIFT Community Moderator

        12.5.4.1.   Phone: (321) 735-2774

        12.5.4.2.   Email: David.Almeida@LSTechLLC.com

Appendix A: SWIFT #8 Attendees

Last Name	First Name	Company
Allen	Jack	A4A
Almeida	David	LS Technologies
Andersson	Markus	ADB SAFEGATE Americas LLC
Andrew	Davy	FAA
Arya	Vikas	Spirit Airlines
Asare	Bernard	Asare.io
Barton	Richard	Solace
Bea	Raymond	ATAC Corporation
Beck	Michael	United Airlines
Bogdan	Bob	CSRA
Bonville	Rachael	Saab Sensis Corporation
Bowe	Tammy	Boeing
Brown	Jim	Collins Aerospace
Brown	Robert	Saab Sensis
Burdick	Chris	FAA
Busey	Steve	Delta Air Lines
Caissie	Remi	Jazz Aviation
Calabrese	Stefanie	Noblis
Capps	Al	NASA
Carniol	Ted	Honeywell
Castle	Cary	American Airlines
Cobbett	Erin	Delta Air Lines
Cole	Eric	FAA
Coupe	Jeremy	NASA
David	Christina	Noblis
Davis	Michelle	Red Hat
DeRoberts	Darin	Honeywell
Diffenderfer	Paul	MITRE
Doerr	Derek	Amazon Web Services
Ferrell	Steven	Red Hat
Fisher	Vick	MITRE Corporation
Gandotra	Manjul	United Airlines
Goldman	Robert	Delta Air Lines
Gorman	Shawn	Mosaic ATM
gottlieb	christopher	jetblue
Green	Thomas	Collins Aerospace
Greenbaum	Dan	MITRE
Griffith	Joshua	Southwest Airlines

Last Name	First Name	Company
Gustin	Joshua	FAA
Hampton	Jesse	Palantir
Harvey	Douglas	L3Harris
Herron	Shawn	LS Technologies
Hetzel	James	Cirium
Hight	Rory	Spirit
Ireland	Colleen	ASRC
Jackson	Donald	Clark Communications
Jagmin	Mike	United
Jehne	Jessica	JetBlue
Johle	Kevin	Flightkeys
Johnson	Leikny	Booz Allen
Jones	Roger	Delta Air Lines
Keskin	Aydin	Palantir Technologies
Koppanen	Suzanne	FAA
Kurian	Biju	Objectstream, Inc
Le	Alex	American Airlines
Lichty	Jarrod	Mosaic ATM
Lima	Pedro	KBR
Long	Kevin	MITRE
Love	Brian	FAA
Lowther	Marcus	Metron Aviation
Lyons	Daniel	America Airlines
Makings	Ryan	Delta Air Lines
Marzette	Cynthia	FAA
Masarky	Scott	LS Technologies
Maynard	Michael	Leidos
McMullen	Bob	FAA
Meyer	Paul	Hartsfield-Jackson Atlanta International Airport
Mitchell	Dana "Mitch"	FAA
Murray	Alex	Noblis
Nagarajan	Shyam	Objectstream
Niznik	Tim	American Airlines
Osse	Wayne	Solace
Ottesen	Robert	Solace
Perkowski	Tom	Eagle
Phung	John	FAA
Plumb	Kerry	LS Technologies
Providakes	David	FAA
Quinan	Kaio	SITAONAIR
Raheb	Robert	Noblis

Last Name	First Name	Company
Rawal	Nimish	Red Hat
Rhodes	Bruce	Jazz Aviation, LP
Robeson	Isaac	Mosaic ATM
Romano	Cheryl	Verizon
Seibert	James	MapLarge
Seralaathan	Lakshmi	American Airlines
Skimmons	Brian	GDIT
Sooley	Brad	Jazz Aviation LP
Spence	Julie	American Airlines
Sperandio	Bill	Southwest Airlines
Steele	Sandie	American Airlines
stellings	ernie	NBAA
Strout	Mark	The Volpe Center / US DOT
Sullivan	Lisa	Palantir Technologies
Takata	Diana	FAA
Talaga	Mark	United Airlines
Tauss	James	HSI
Thomas	Damon	FAA
Thomas	Mark	Mosaic ATM
Toro	Marcello	L3Harris
Torres	Daniel	FedEx Express
Tuck	Bill	Delta Air Lines
Uswajesdakul	David	United
Van Name	Ashley	JetBlue
White	Felisa	FAA
Wuich	Jay	Jeppesen
Yang	Milton	Leidos
Zimmer	Jay	LS Technologies