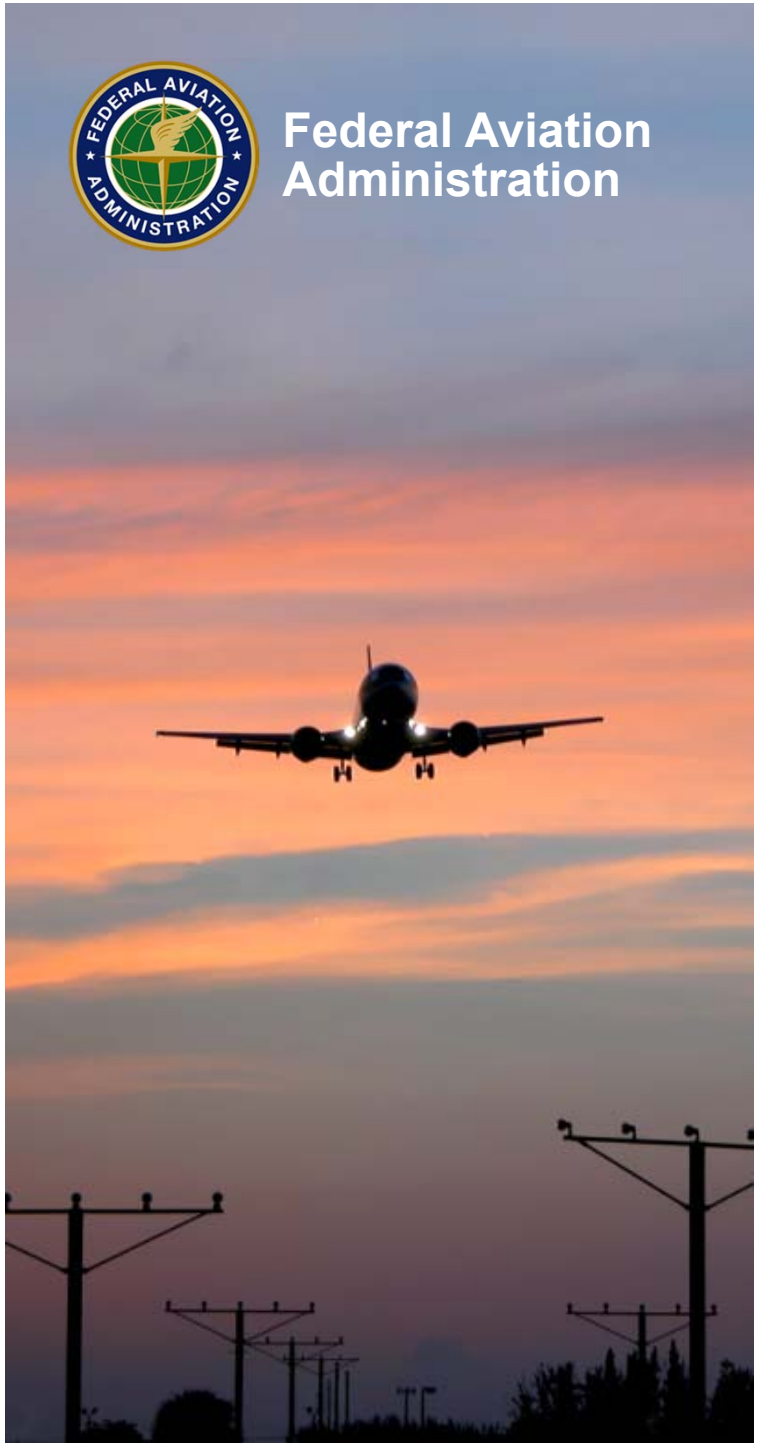
Integrated SWIM Services



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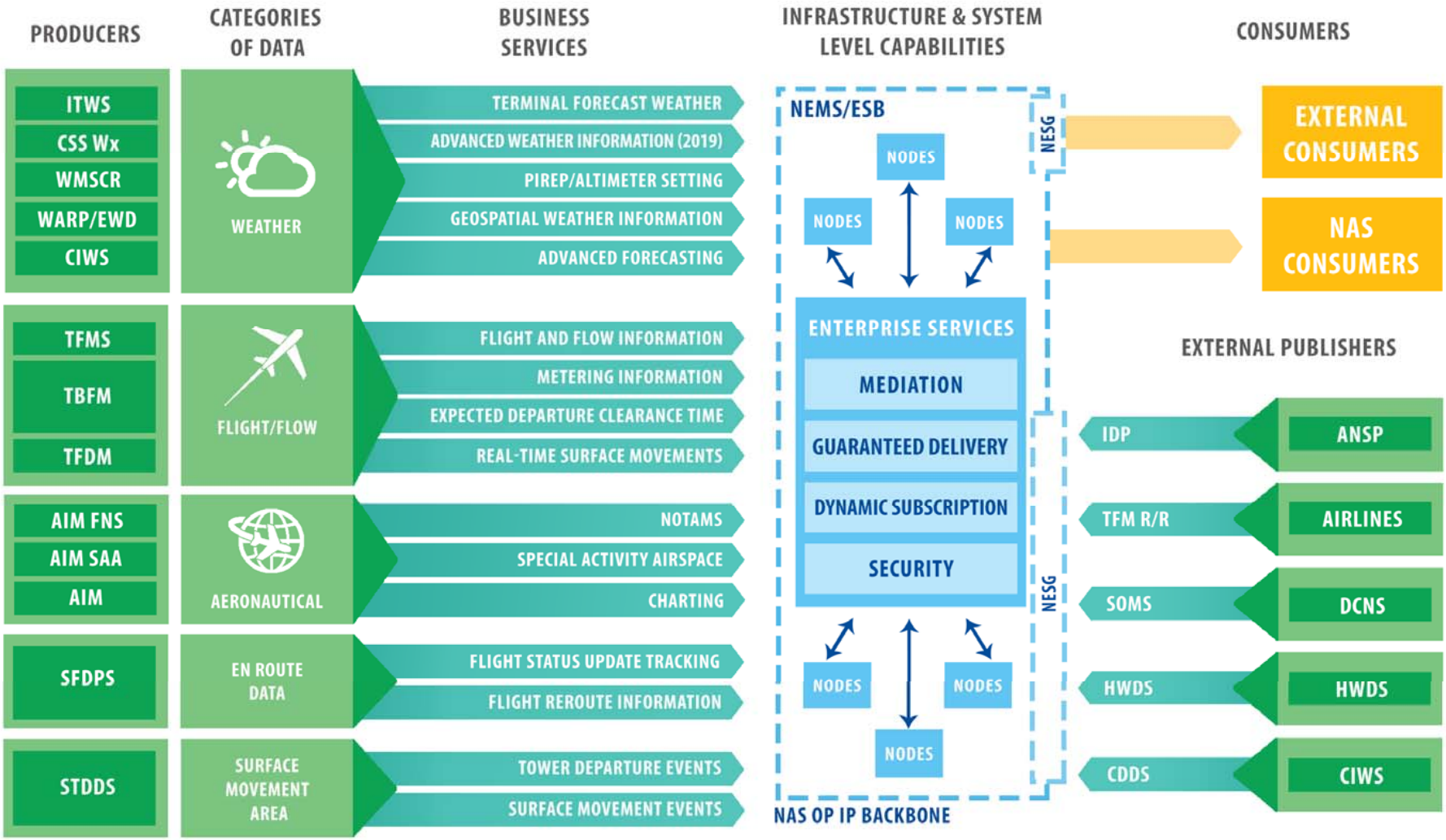
Agenda

- Introduction
- Business Services
- SWIM Services
- Examples of Use
- Integrated Services and Tools
  - STDDS / SVT
  - TBFM / NOD
  - NCR

- Replaces unique interfaces with **modern standards based data exchange**
- **Leverages a single interface** to receive multiple data products
- **Provides SWIM users access to information** without directly connecting to another system
- **Provides enterprise security** for incoming and outgoing data
- **Establishes Enterprise Help Desk** for SWIM operational consumer calls

http://www.faa.gov/nextgen/swim

SWIM Business Service



SWIM Services

Traffic Flow Management Service (TFMS)

- TFMS Flight Information

  Provides Flight Plan data initial and subsequent amendments , Departure and arrival time notifications, Flight cancellations, Boundary crossings, Track position reports, NAS Common Situation Model (NCSM), Restrictions

- TFMS Flow Information

  Provides Collaborative Trajectory Options Program, Flow Constraint Area / Flow Evaluation Area, Ground Delay Program / Unified Delay Program , Ground Stop, Reroutes, ATCSCC Advisories, Airspace Flow Program, Airport Runway Configuration and rates, Airport Deicing status, Restrictions

- TFMS Status

  Provides status of all of the data flows that directly or indirectly contribute to all of the JMS messages received and/or transmitted to SWIM via NEMS.

Federal NOTAM System (FNS)

- Provides digital NOTAM messages in Aeronautical Information Exchange Model (AIXM) format
- Available as either a Web Service or JMS Service

SWIM Services (continued)

Integrated Terminal Weather Service (ITWS)

- Provides variety of weather products: Microburst, TAF, Precip., Airport Lighting,etc.

SWIM Terminal Data Distribution Service (STDDS)

- Surface Movement Event Service (SMES)

  Sends derived surface movement events for all aircraft monitored at select towers

- Airport Data Service (ADPS)

  Publishes runway visibility and aircraft touchdown trends

- Infrastructure System Monitor and Control (ISMC)

  Sends status information for external systems associated with an STDDS site

- Terminal Automation Information (TAIS)

  Publishes operational live data: flight plan, track, SISO, alert, IMC, traffic count, performance monitoring

Time Based Flow Management (TBFM)

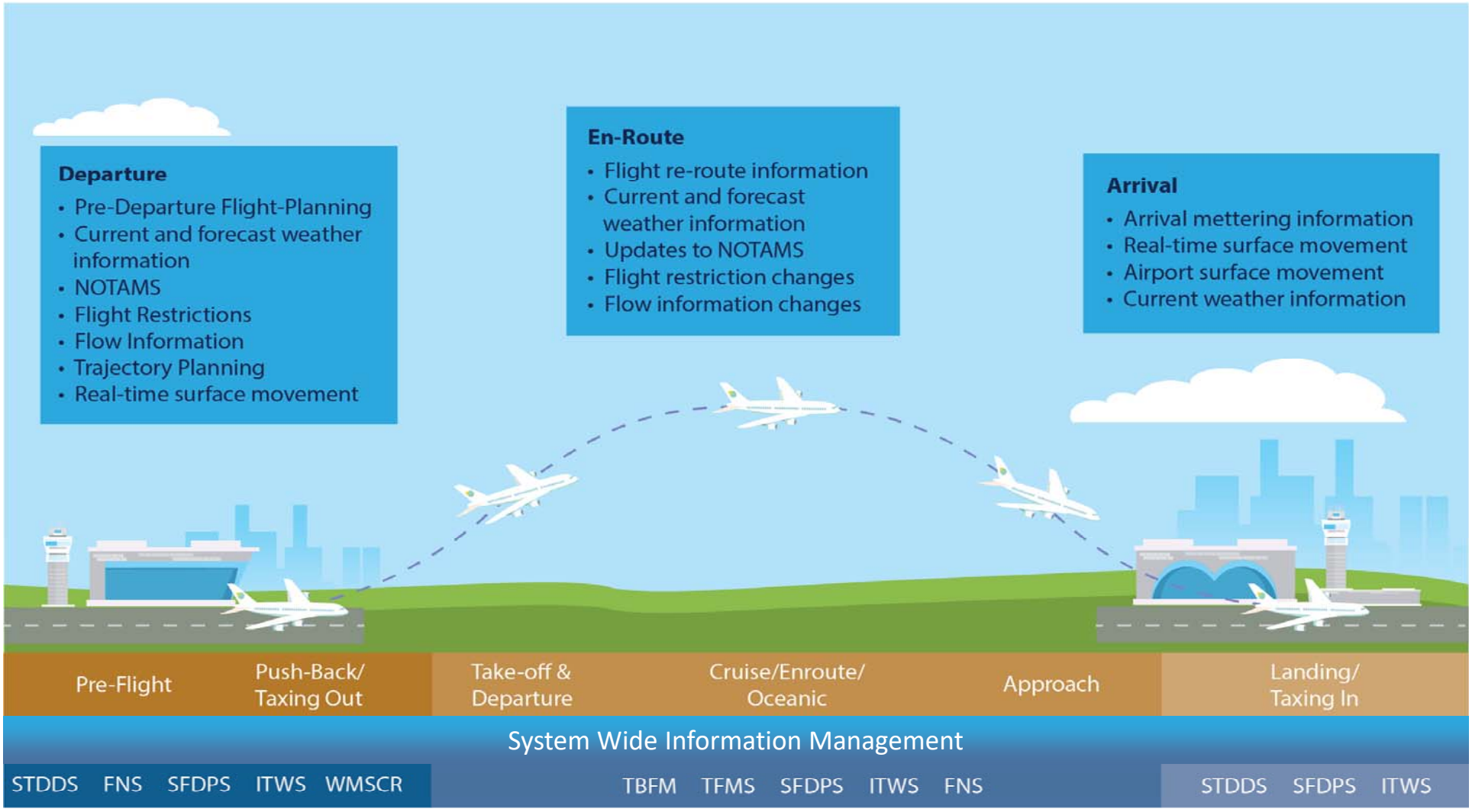
- Publishes: TBFM Metering Status, Gate Name, Arrival Airport Info., Airport Config., Arrival Config., MRE Information, Arrival Airport Config. Info., etc.

SWIM En Route Flight Data Publication Service (SFDPS)

- Publishes flight plan, track, and other flight-related messages

HOW IS SWIM DATA CURRENTLY USED BY AIRLINES?

SWIM Services By Phase of Flight



Current Use of SWIM Data by Airlines

Source	Functionality	Use
FNS	NDS	NOTAMS for North America
SFDPS	Flight Data Publication	Flight Status Update Tracking
SFDPS	Flight Data Publication	Ingest of flight reroute information
STDDS	SMES	Monitor the efficiency of airline scheduling
STDDS	SMES	Record and replay operations to determine reason for delays (both movement and non-movement areas)
STDDS	APDS	Used by NOC supervisors to determine when a flight must be diverted to an alternate station
STDDS	SMES	Display all surface traffic at major hub airport, provide view in areas where ground controllers do not have direct line of sight
TBFM	MIS	Reception of Expected Departure Clearance Time (EDCT) for fleet aircraft
TFMS	NTML	Ingest of National Traffic Management Log data
TFMS	ASDI	Track flights times (Arrival / Departures), flight reroutes, triggering of turbulence plots messages for any turbulence in the path of the flight that is not included in the flight plan via ACARS
TFMS	ASDI	Display flight position superimposed on weather graphics
TFMS	EDCT	Inform the NOC which flights are involved in ATV Delay Programs, Update estimate departure and arrival times for affected flights
TFMS	EDCT	Send flight crews wheels up times
TFMS	EDCT	Track aircraft delays
TFMS	R13	Ingest of NAS restrictions pertinent to fleet

Airport Departure / Delay Management

Use Case

SWIM Information Services

- SWIM Terminal Data Distribution Service
  - Surface Movement Event Service
  - Airport Data Service
- Traffic Flow Management Data Service
  - R13 Req/Reply
  - R13 Status
  - R13 TFDM
- Time-Based Flow Management - Metering Service
- Federal NOTAM Service

- Monitoring real time changes in departure time and re-routing events
- Uses airport surface data combined with traffic flow and metering
- SWIM information provides alert on potential delay impacts, using a variety of in-house and 3rd party applications

Benefits

- Improvement in flight planning predictability
- More efficient use of gate and ramp resources
- Enhanced accuracy of EDCT prediction
- Increased flight time accuracy
- Notification of flights which are involved in ATC Delay Programs
- Provides NOC supervisors with enhanced information for making decision on flight diversion
- Enhanced traffic flow modeling and management

SWIM Terminal Data Distribution System (STDDS)

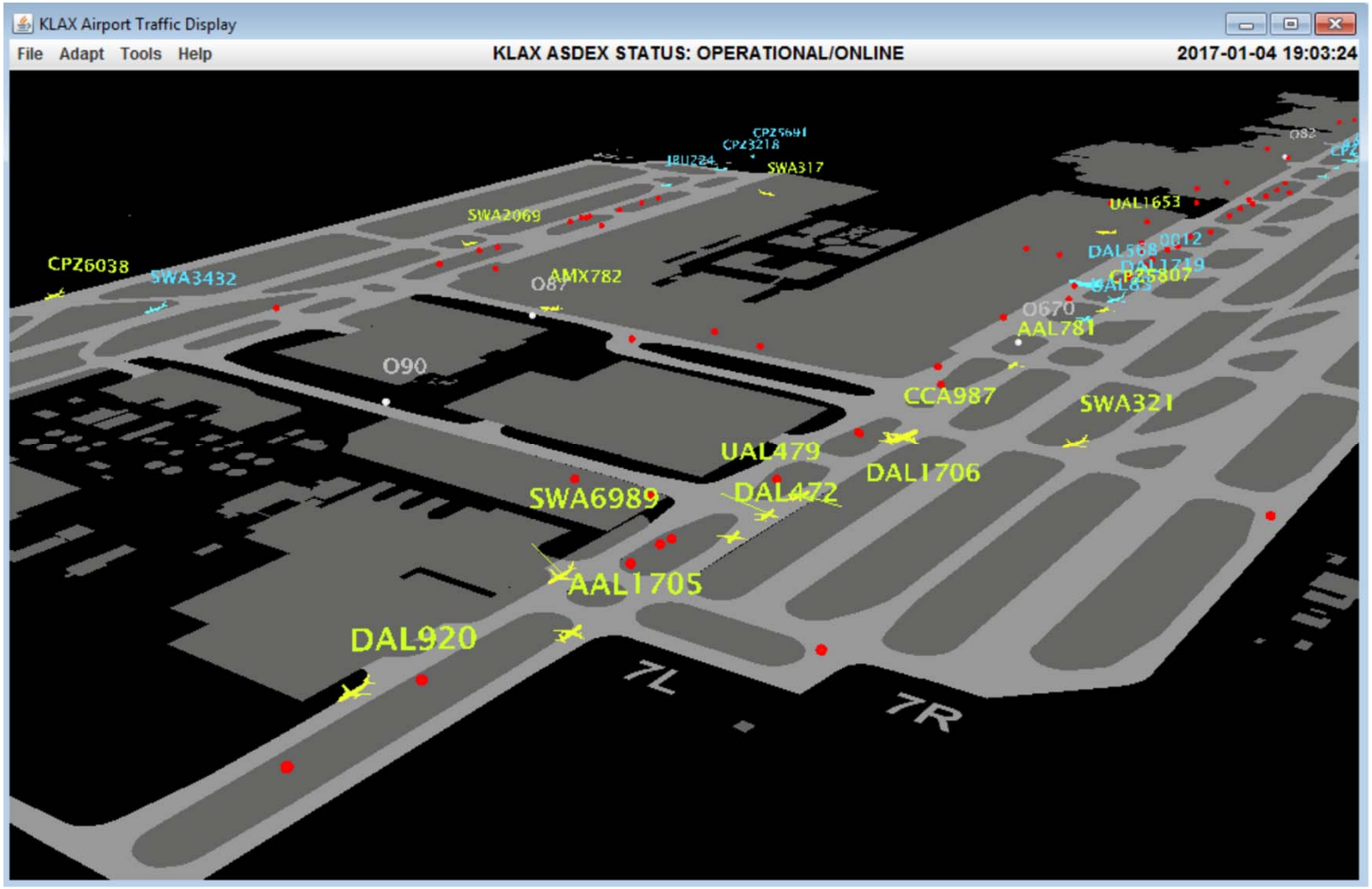
- Combines Flight, Weather, and Aeronautical data relevant to flight operations in/around airport surface and distributes through four information services:
  - Airport Data Service (APDS)
  - Infrastructure, System Monitor and Control Service (ISMC)
  - Surface Movement Event Service (SMES)
  - Terminal Automation Information Service (TAIS)
- Enables users who's operations are specific to the airport surface to receive accurate, timely, and relevant data (see SVT example)
- Provides:
  - Airport Surface / Terminal Area Tracking
  - Runway conditions
  - Aircraft status
  - Flight Plan
  - Etc.

SWIM Visualization Tool

- **What is SVT?**
  - SVT is a government developed prototype fielded to select TRACONS as part of TFDM Early Implementation
  - Web application tool providing Surface Situational Awareness utilizing surface data from SMES beyond control tower

- **What does SVT do?**
  - Provides a view of airport surface for users not located at airport tower
  - Provides the airport layout which includes runways, taxiways, buildings, and other airport features.
  - Provides situational awareness for airports with shared departure fixes
  - Tracks aircraft positions along with their data blocks which include flight number, aircraft type, etc.

SVT - Screenshot

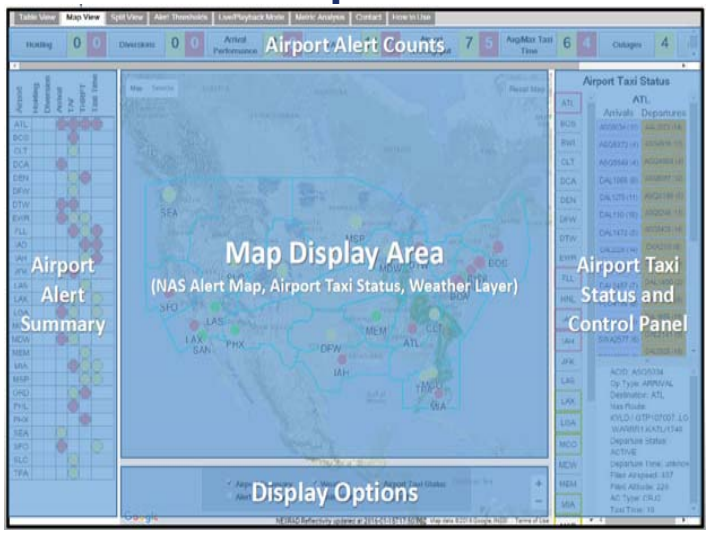


Time Based Flow Management (TBFM)

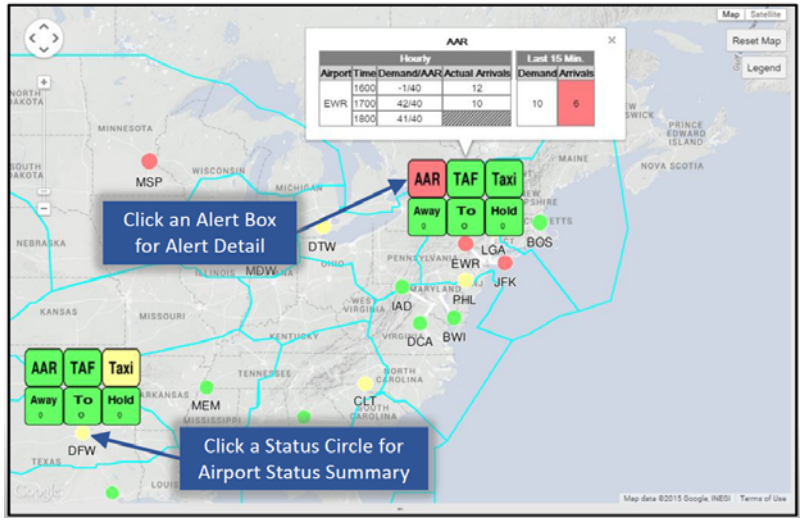
- Uses time separation instead of traditional miles-in-trail to provide more efficient control of flow, reducing aircraft fuel burn
- Provides:
  - Departure Scheduling
  - En Route Departure Capability
  - Airborne Metering
  - Arrival Management/Situation Awareness
- User are able to receive the following real-time through SWIM
  - Metering Status
  - Arrival Airport Information
  - Airport Configuration
  - Airport Acceptance Rate
  - Estimated & Scheduled ETA
  - Etc.

NOD Integrated Application

Map View



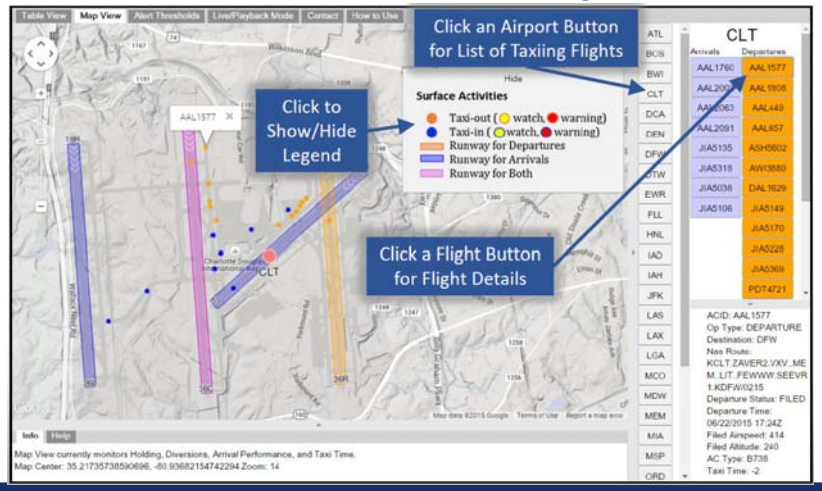
Airport Performance View



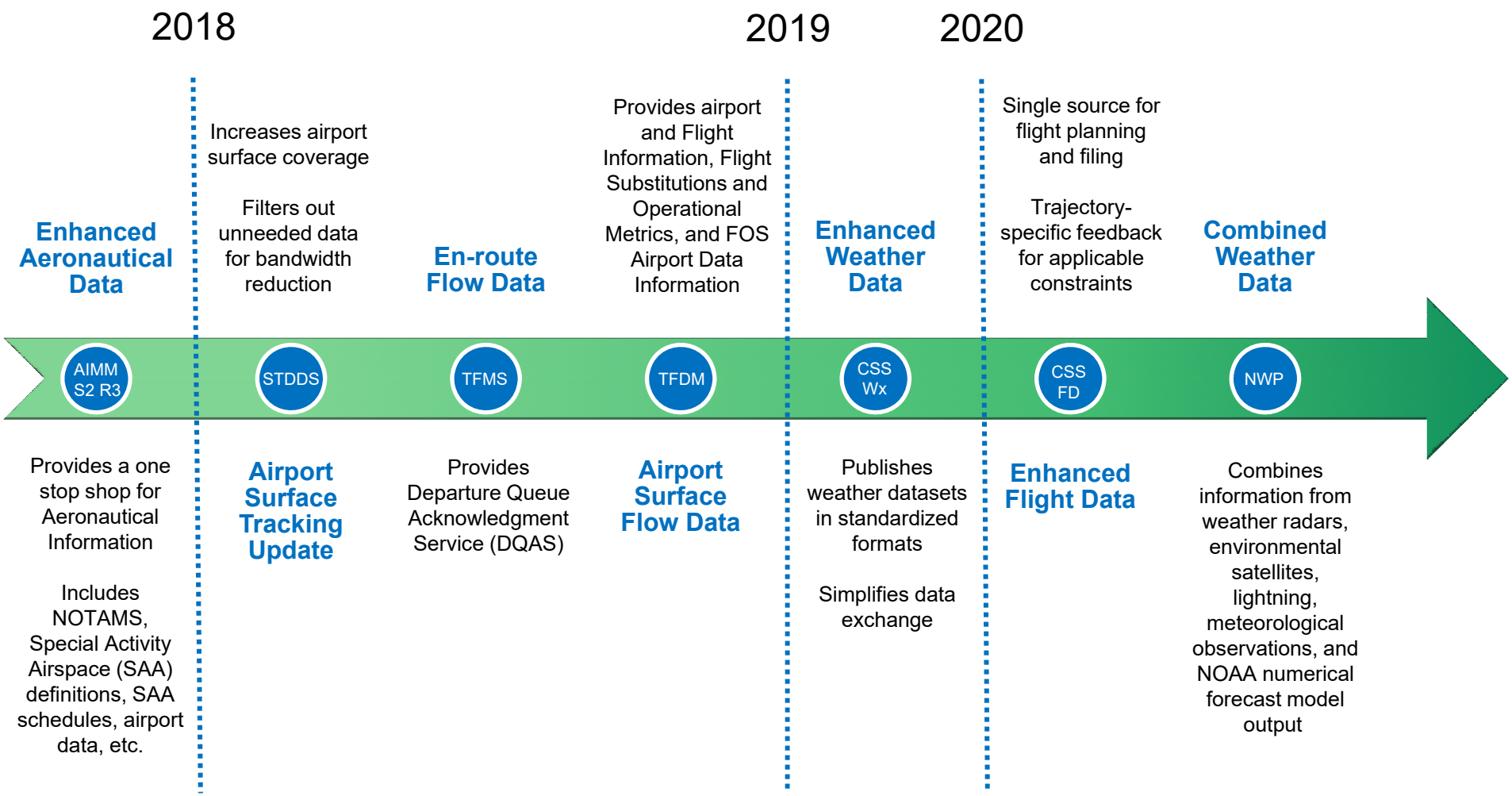
Provides high-level status of FAA NAS

- Holding Flights Tracking
- Flight Diversion Tracking
- Airport Weather
- Airport Arrival Performance
- Average/Max Taxi Time
- Airport Throughput
- Weather Overlay

Airport Surface Activity View



New SWIM Information Services Roadmap

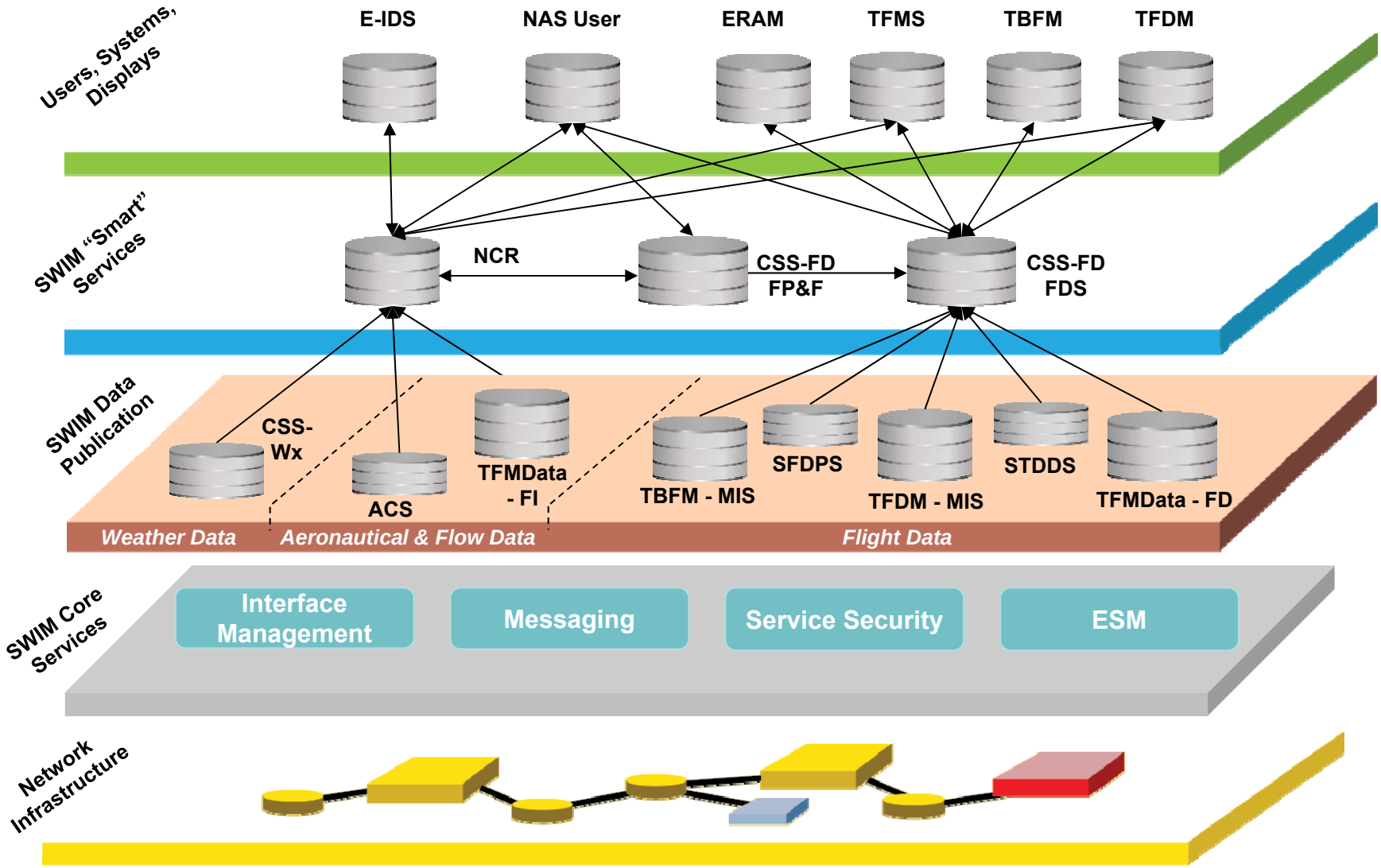


NAS Common Reference

Provides a standardized data repository with integrated data from multiple FAA systems reducing user integration effort through the use of common industry standards

- Collects data from:
  - Traffic Flow Management System
  - Digital-NOTAMS
  - Special Activity Airspace
  - Runway Visual Range
  - Common Support Services – Weather
- NCR stores this data in a common OGC format, enabling simple integration with user system already using OGC standard interface
- Reduces user development requirements

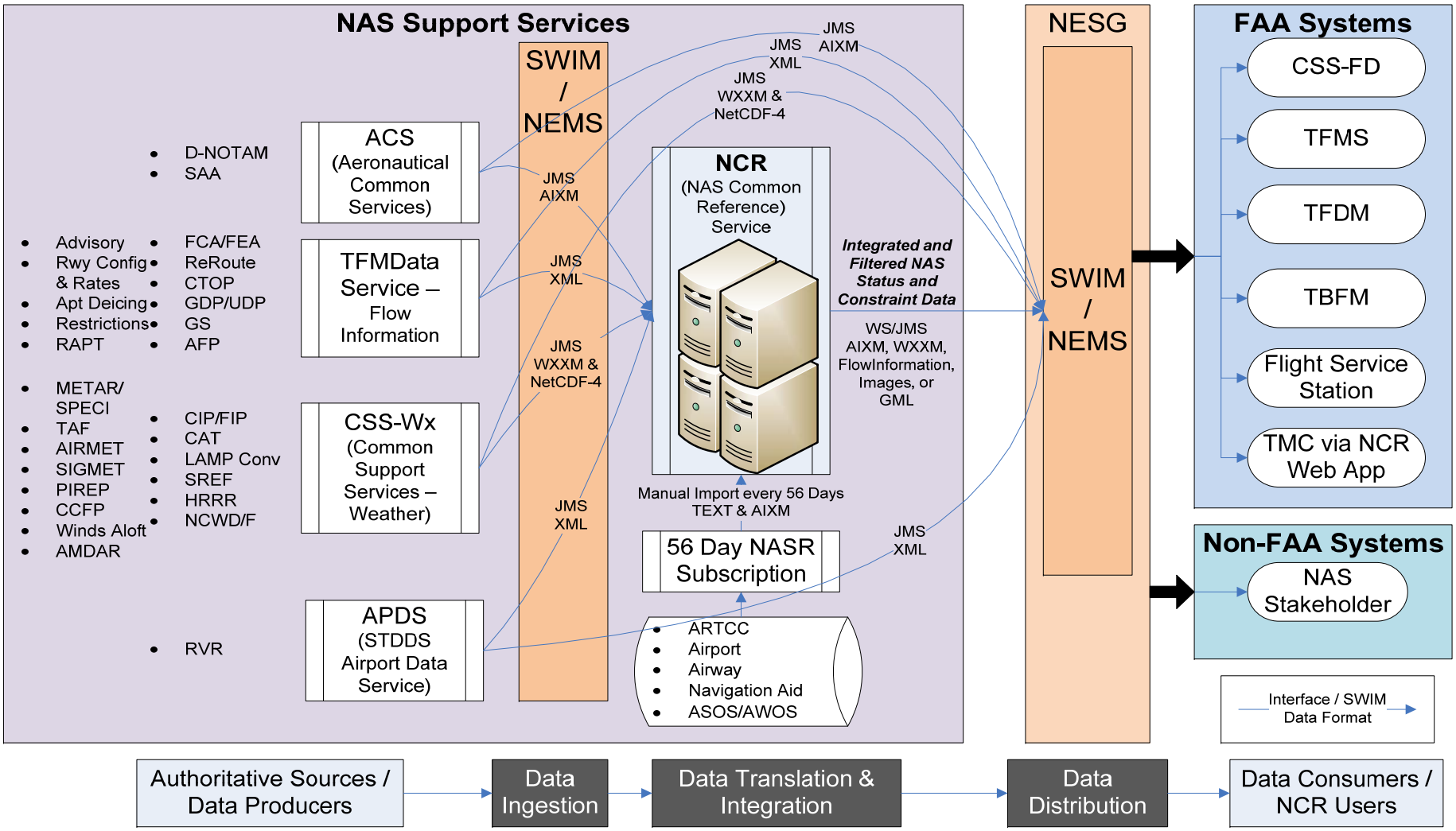
Smart Evolution of SWIM Services



NCR: Use case

- **Problem Statement:**
  - Existing FAA SWIM users find that parsing and storing data from FAA SWIM can require substantial resources and expertise
  - There are many cases in which users are unintentionally receiving more information then they need / want
  - Currently the solutions are:
    - Users invest into development / products to enable integration of FAA SWIM data into existing systems (costly for users)
    - FAA Producers develop customer software for each SWIM service to support customer use of data (inefficient / cost for FAA)
- **Solution:**
  - NCR imports data from FAA SWIM services and store it in a standardized OGC data format with a standardized interface
  - This use of a common standard both at the data level and the access level reduces cost of integration by users

NAS Data Architecture



Summary

- SWIM is about services, not just data
- FAA is seeing increased need for advanced services
- Integration of individual systems using services provides greater flexibility and value to SWIM users
  - Smart Services: User feedback and use case development enables tailoring of services to better support stakeholders
- Use of messaging & data standards enhances ability to integrate different data types together into one application
- FAA are working with user community to provide tools and greater insight into SWIM Services