

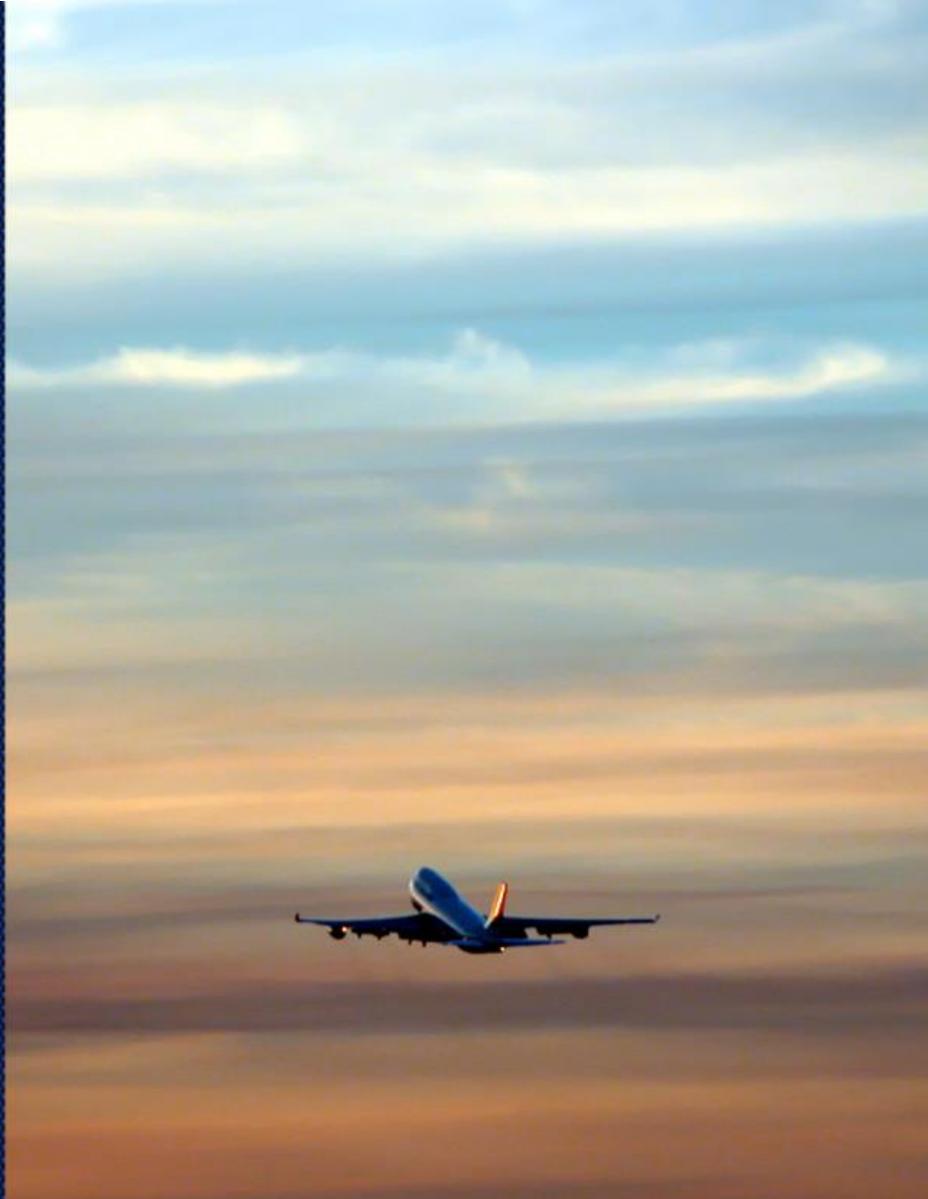


# FAA Enterprise Network Services (FENS)

Industry Day—April 25, 2018



**Federal Aviation  
Administration**



# Agenda

TIME (AM)	TOPICS	PRESENTER
8:00 – 8:30	Check-in	
8:30 – 8:40	Welcome and Logistics	John Kreger, VP for Public Center Programs, Center for Programs and Technology, MITRE
8:40 – 8:50	FAA Introduction: FENS Industry Day	Joe Lahoud, Program Manager, FENS
8:50 – 9:10	Keynote Remarks: Turning Great Ideas into Improvements	Kristen G. Burnham, VP, PMO
9:10 – 9:30	How the FAA's Needs for Communications Services Are Expected to Evolve	Pamela Whitley, (A) Assistant Administrator, NextGen
9:30 – 9:45	Acquisition Excellence: A Landscape for FENS	Nathan Tash, Deputy Assistant Administrator, Office of Acquisitions and Business Services, Chief Acquisitions Officer
9:45 – 10:00	Break	N/A
10:00 – 10:20	FAA Overview	Joe Lahoud, Program Manager, FENS
10:20 – 11:00	Overview of the FAA's Current Network Environment	Patton Turner, Chief Systems Engineer, Communications, Information and Network Programs
11:00 – 11:15	Insights Gained from Market Research	Todd Gardner, Lead Engineer, FENS
11:15 – 11:45	FAA Vision for the Future Network Environment	Ray Goulet, Architecture Lead, Communications, Information and Network Programs



# Agenda

TIME (PM)	TOPICS	PRESENTER
11:45 am– 1:00 pm	Lunch	MITRE
1:00 – 1:30	Potential Differences in Requirements	Todd Gardner, Lead Engineer, FENS
1:30 – 1:45	Current State of SWIM and Future Direction	Jeri Groce, Program Manager, SWIM
1:45 – 2:00	Break	N/A
2:00 – 2:20	What's Next? FAA's Near-term and Longer-term Plans for the FAA Enterprise Network Services Program	Dennis Scanlon, Contracting Officer, FENS
2:20 – 2:35	Closing: Network of the Future	Steven Bradford, Chief Scientist, NextGen, ANG-3
2:35 – 3:45	Questions and Answers	FENS Program Office
3:45 – 4:00	Closing	Joe Lahoud, Program Manager, FENS

*Today's presentation slides will be made available to industry via FAACO.*

# Question Submission

We will have a question and answer session in the afternoon.

Please write your questions on the cards provided. They will be collected at the end of each session.

Todd Gardner | Lead Engineer, FENS

---

# Potential Differences In Requirements

## FAA Enterprise Network Services Program vs. FAA's Legacy Environment

# FENS Key Considerations



1

FENS will be a service-based environment

2

Based on traffic modeling, FAA bandwidth needs will continue to increase substantially

3

NAS requirements for performance and operations will continue to be demanding

4

Commercial TDM resources will be less available, more costly and have decreasing maintainability, as copper (TDM-based) infrastructure is replaced by fiber and wireless access

# FENS Key Considerations



**5** Cloud services will change the FENS traffic flow requirements

**6** Carriers will phase out aging technologies (e.g. TDM) replacing them with modern technology (Carrier Ethernet, LTE, Satellite) to deliver FENS services

**7** Cost per bit is expected to decrease while the minimum bandwidth order is expected to increase

**8** Evolving technologies may allow FENS to leverage commercial transport instead of a dedicated FAA backbone

# FENS Information Security Considerations

## FAA Information Security and Privacy policies consolidated into a single document: FAA Order 1370.121, FAA Information Security and Privacy Program & Policy

- Policies address all NIST 800-53 control areas
- Being revised to facilitate potential adoption of shared network/management services

**Like FTI, FENS is expected to be categorized as FIPS-199 High**

- NIST 800-53 controls will be tailored to Air Traffic Organization (ATO) requirements

**FAA has formally adopted DOT Cybersecurity Compendium, NIST SP 800-53, Other DOD, DHS, FedRAMP guidelines**

# Requirements That Are Not Likely to Change Under FENS



Most user requirements will not change from a performance standpoint, e.g., availability, latency,...

- Bandwidth for those services may increase
- High availability and other services requiring diverse access will be on FENS



25,000+ NAS Services and ~1,100 Admin Services needed to operate the FAA will be available on FENS

- The number of NAS services and proportion that are TDM will evolve over time



TDM interfaces will initially be required for legacy NAS services



Mission-driven security and performance requirements will continue to be demanding



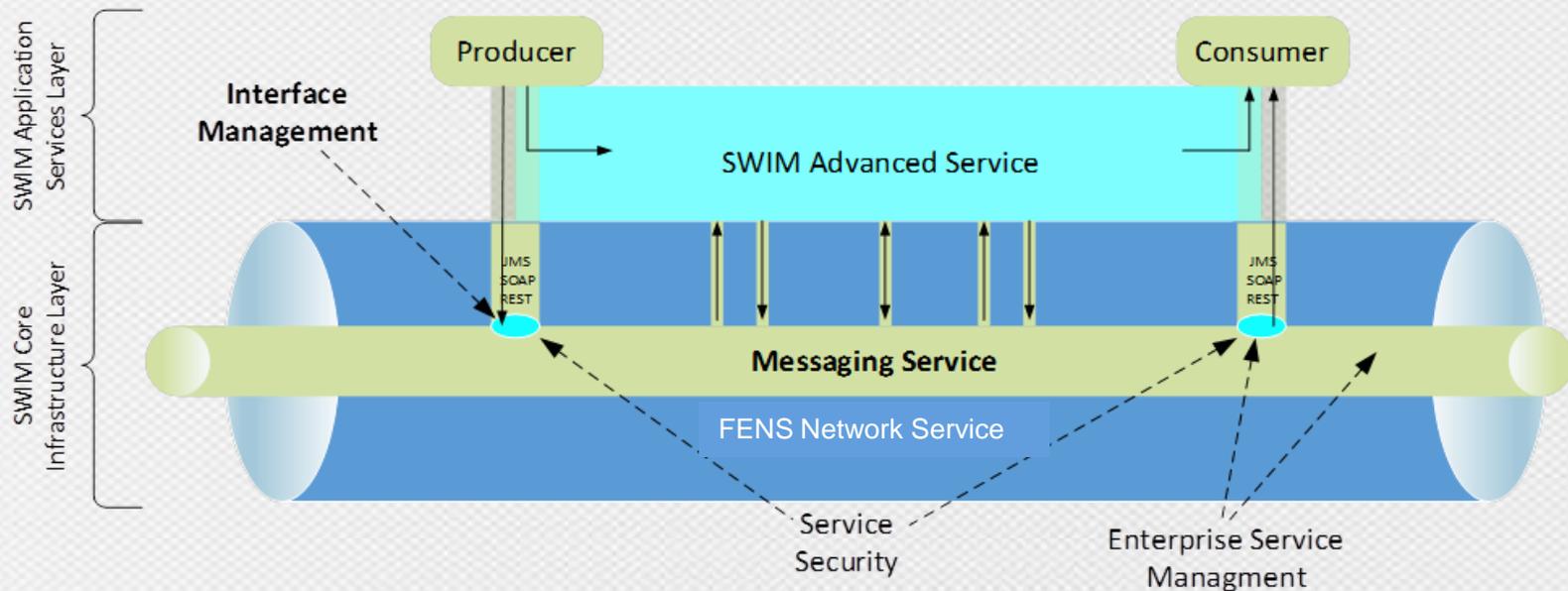
# FENS will include SWIM Core Functionality

## SWIM CORE

- Provided by FTI currently
- Requirements: Messaging Service, Interface Management
- Optional Requirements: Enterprise Service Management & Service Security

## ADVANCED SWIM SERVICES

- Acquisition approach is still being developed
- Advanced Mediation, Transformations
- Smart Services: Information & Infrastructure Services
  - Enabling infrastructure for establishing smart services



# FENS Service Catalog Approach

The FAA is considering a new approach to defining the orderable commodities

Current approach on the FAA's legacy program:

- The FAA defines distinct “services classes” that correspond to particular types of services that must be orderable for FAA users
- There are currently 135+ distinct service classes
  - Uniquely defined based upon the RMA, latency, physical interfaces, etc.

FENS Service Catalog Approach:



- Offerors will be required to propose a “standard catalog” of orderable services
- May be based on commercial standards or tailored as needed to meet FAA-specific requirements

# FENS Service Catalog Approach



**HOW  
MIGHT IT  
WORK?**

**The FENS Spec issued with the SIR would contain a list of required services**

- Services would be described based upon a set of characteristics that define the required performance level, physical interface, etc.
  - Could be hundreds of possible combinations

---

**Offerors would have the flexibility to propose a Service Catalog that supports the required combinations**

- Not necessarily one-to-one
  - e.g., an offeror could propose 20 distinct orderable services to cover 200+ required combinations

---

**Price evaluation would consider each offeror's proposed mapping of the orderable services within the proposed Service Catalog to meet the FAA's traffic demand set**

# FENS Service Catalog Approach

## FENS OFFERORS COULD PROPOSE:

- Rules/criteria for selecting the orderable service from the catalog that meets a particular service requirement
- A business process for keeping the Service Catalog up-to-date

## SERVICE CATALOG APPROACH WOULD SUPPORT:

- The ability to obtain cost estimates for services to support longer term and near term planning
- Having established prices for services when orders are placed

## UPON CONTRACT AWARD:

- The required combinations included in the SIR would be replaced with the services in the vendor's catalog
  - Would also include the ordering rules/guideline



# FENS Communications Service Flows

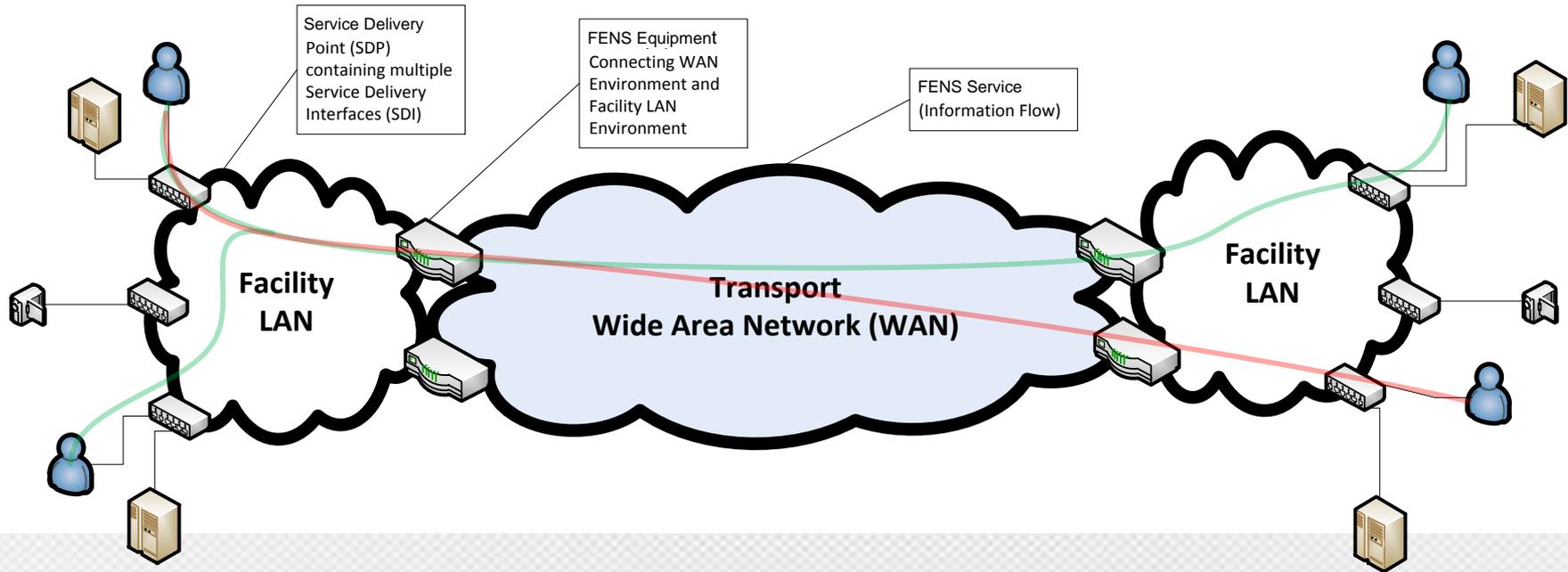
The ordering of physical interface for IP services will be separated from the individual orderable data flows

- |  |   |   |   |
|--|---|---|---|
| <ul style="list-style-type: none"><li>• Service flows would be ordered to a pair (or more) of interfaces</li></ul> | <ul style="list-style-type: none"><li>• Leverages enhancements in the marketplace that provide better visibility into the individual data flows</li></ul> | <ul style="list-style-type: none"><li>• Provides the FAA with greater flexibility</li></ul> | <ul style="list-style-type: none"><li>• Allows “per flow” Service Level Agreements (SLA) and availability</li></ul> |
|--|---|---|---|

## Intra-Facility LAN Service for NAS

- |   |  |
|---|--|
| <ul style="list-style-type: none"><li>• Facilitates distinction between intra-facility and inter-facility bandwidth needs</li></ul> | <ul style="list-style-type: none"><li>• Allows demarcation point to be closer to user system</li></ul> |
|---|--|

# FENS Communications Service Flows



**COMMUNICATIONS SERVICE FLOWS  
(RED, GREEN) BETWEEN INTERFACES SHOWN**

# FENS Service-on-Demand



Real time or near real time service ordering and delivery where capacity exists

*More flexibility in service ordering*

*New FAA user systems*

*Increase in bandwidth for users*

*New services to support rerouting of information due to facility failures or other system impacts (like disasters)*

Real time and scheduled temporary service upgrade/downgrade

*Nightly facility closures/consolidation*

*Database upload during off-peak times*

*Better utilize “off-peak” capacity*

# FENS Service-on-Demand



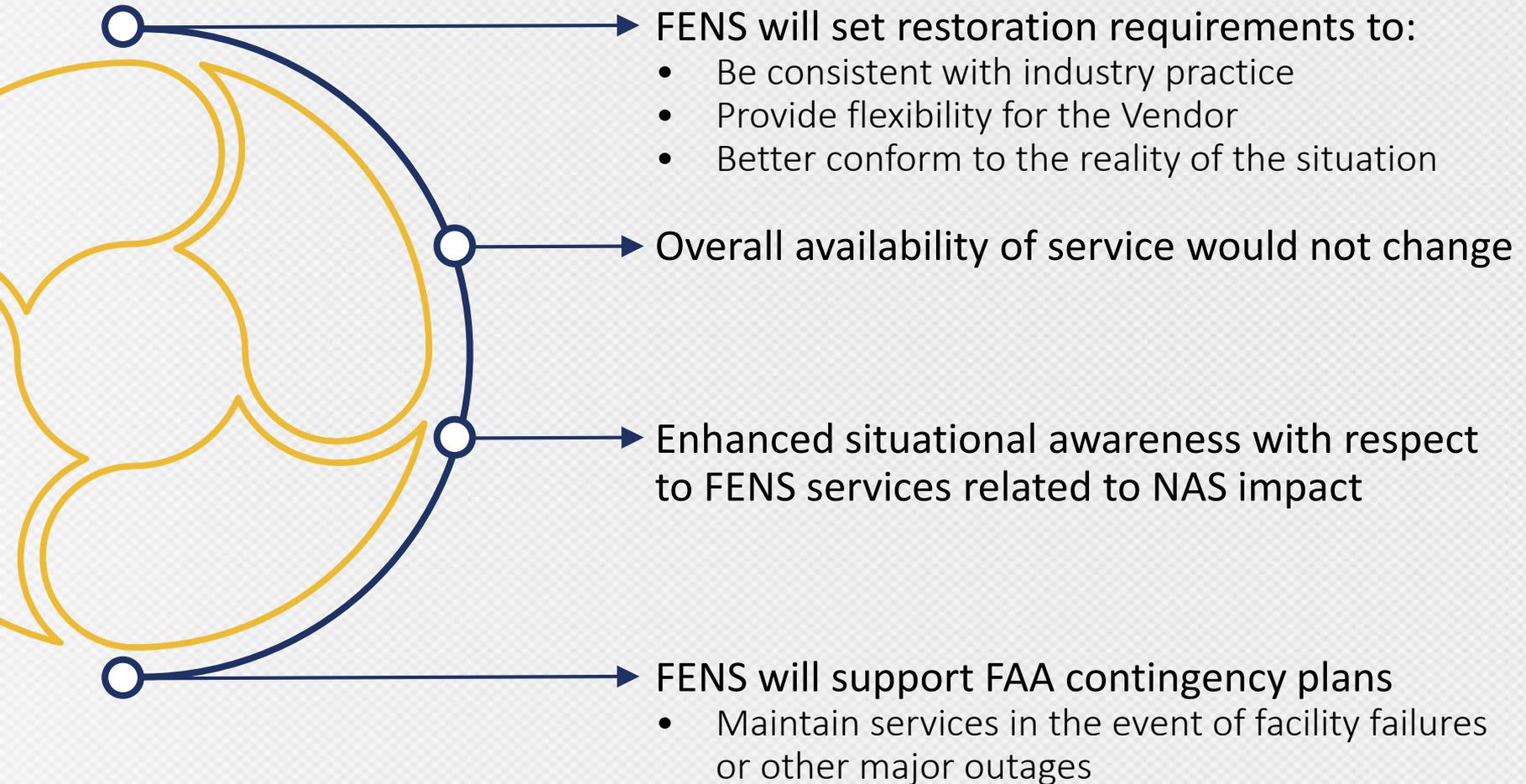
## Pay “by the bit” services

- Low data rate
- High latency
- Infrequent use systems/sensors
- More flexibility in service cost

## Automated tools to support real time costing of services

- Faster ordering/provisioning of services

# FENS Service Management and Restoration



# FENS Survivability and Security Changes



**FENS will have enhanced survivability requirements**

- Goal is to eliminate large facility/regional/network outages
- Applies to network-wide routing failures
- Applies (as applicable) to catastrophes (like natural disasters)



**FENS will provide Enterprise Security Gateway capabilities between external networks and between FAA domains with 24x7 monitoring**

- Capabilities enhancements should include:
  - Intrusion Detection of malware, advanced and anomalous threats
  - Behavioral analytics
  - Situational awareness

# Question Submission

We will have a question and answer session in the afternoon.

Please write your questions on the cards provided. They will be collected at the end of each session.

Jeri Groce | Program Manager, SWIM

---

# Current State of SWIM and Future Direction

# WHAT IS SWIM?

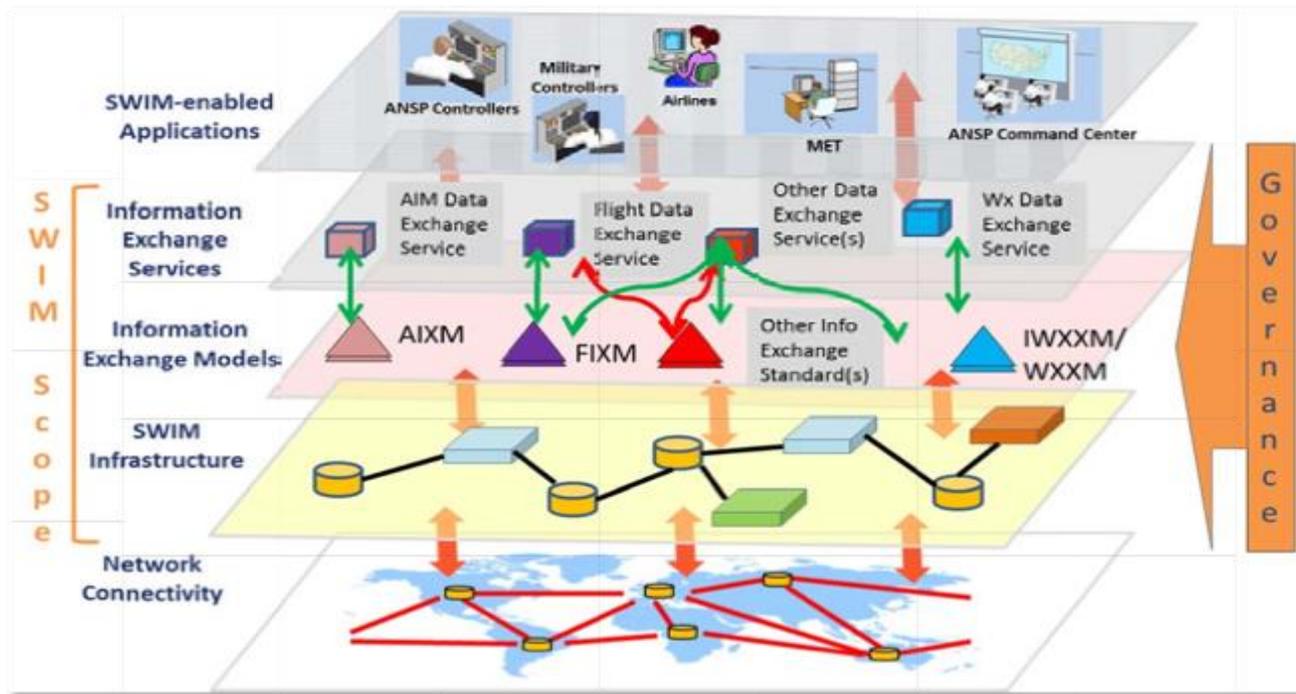
System Wide Information Management (SWIM) is the infrastructure that allows members of the Aviation Community to access the information need to facilitate an innovative and efficiently run National Airspace System (NAS).

## What is SWIM doing for the Aviation community?

SWIM makes it possible to have access to real-time, relevant aeronautical, flight and weather information so users (both within, and outside the NAS) can respond faster, more accurately, creating collaboration opportunities with the industry.



# SWIM Overview



SWIM is an information management model that applies service-oriented architecture (SOA) to aviation, releasing data available from Air Traffic systems

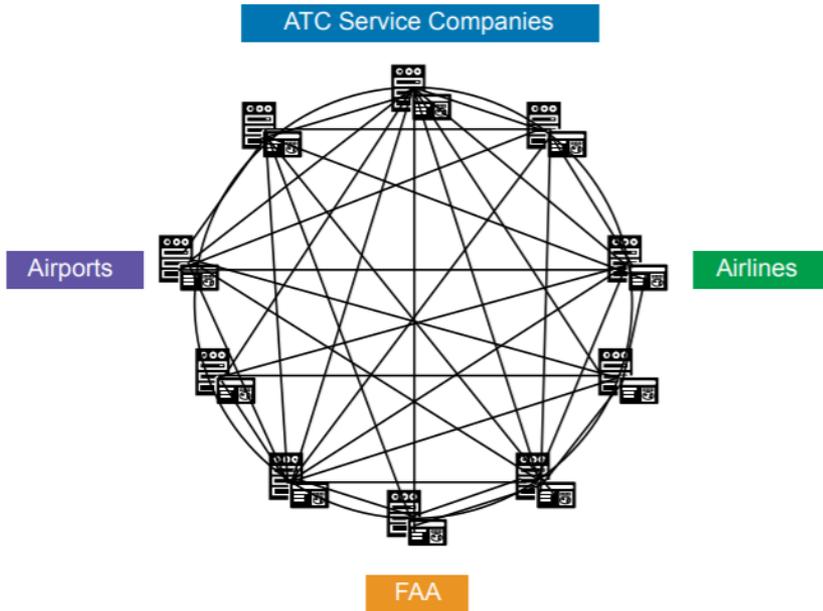
SWIM consists of standards, governance & infrastructure enabling ATM information management between users, using interoperable services.

Primary design characteristic of service-orientation is reusability

*"ICAO SWIM Manual 10039"*

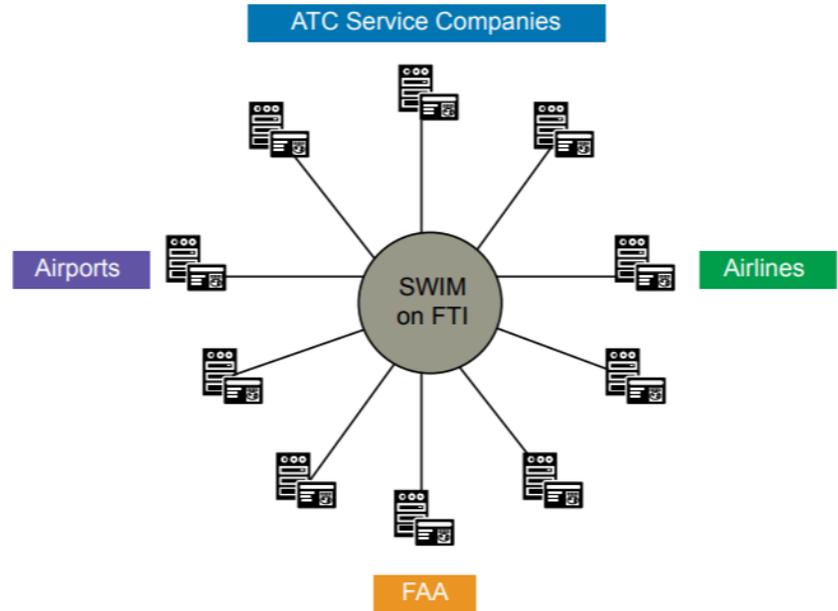
# Interoperability with SWIM

## BEFORE SWIM



Users could only share information point-to-point

## WITH SWIM

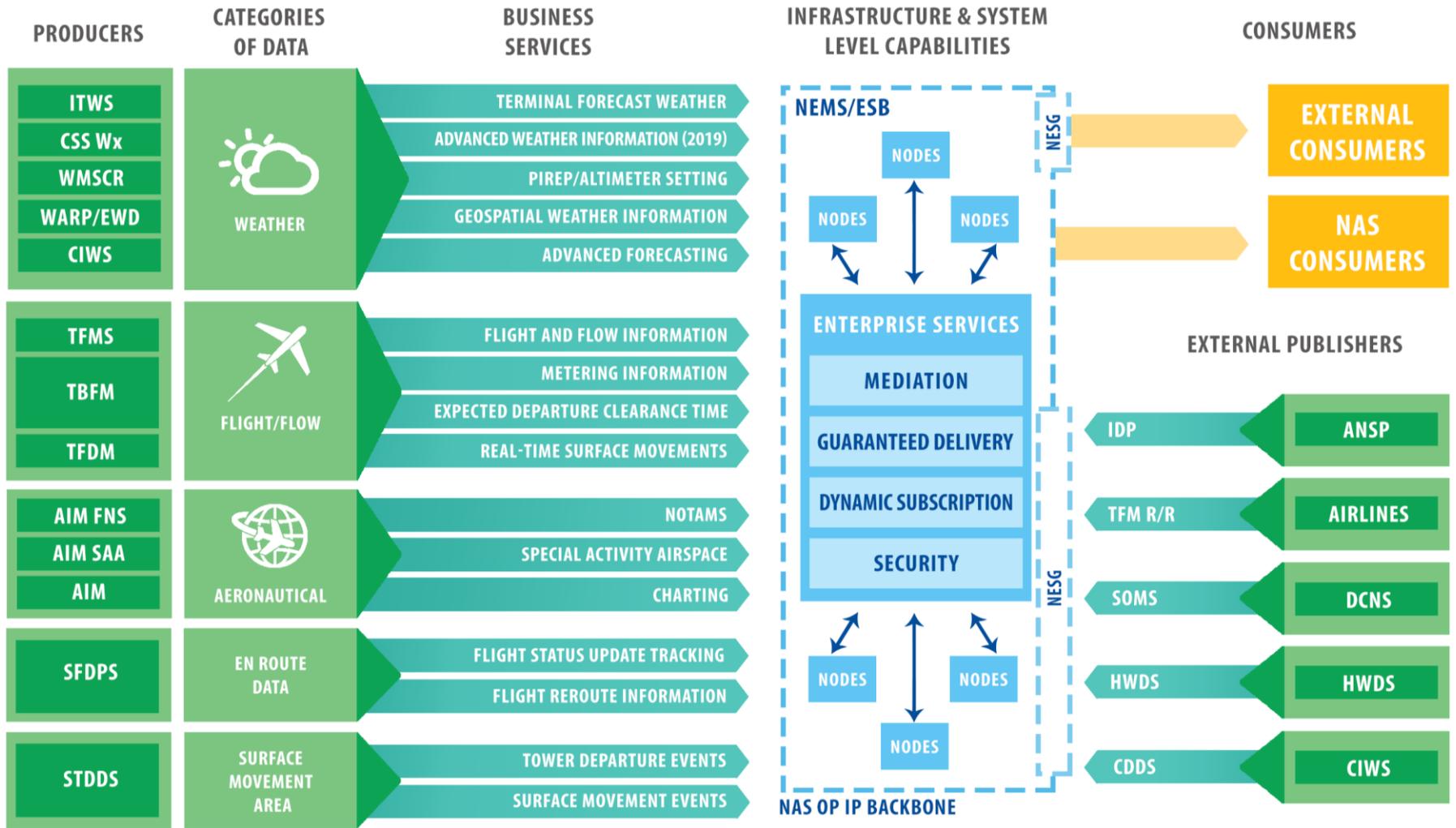


All users can publish and retrieve subscribed information using a common source

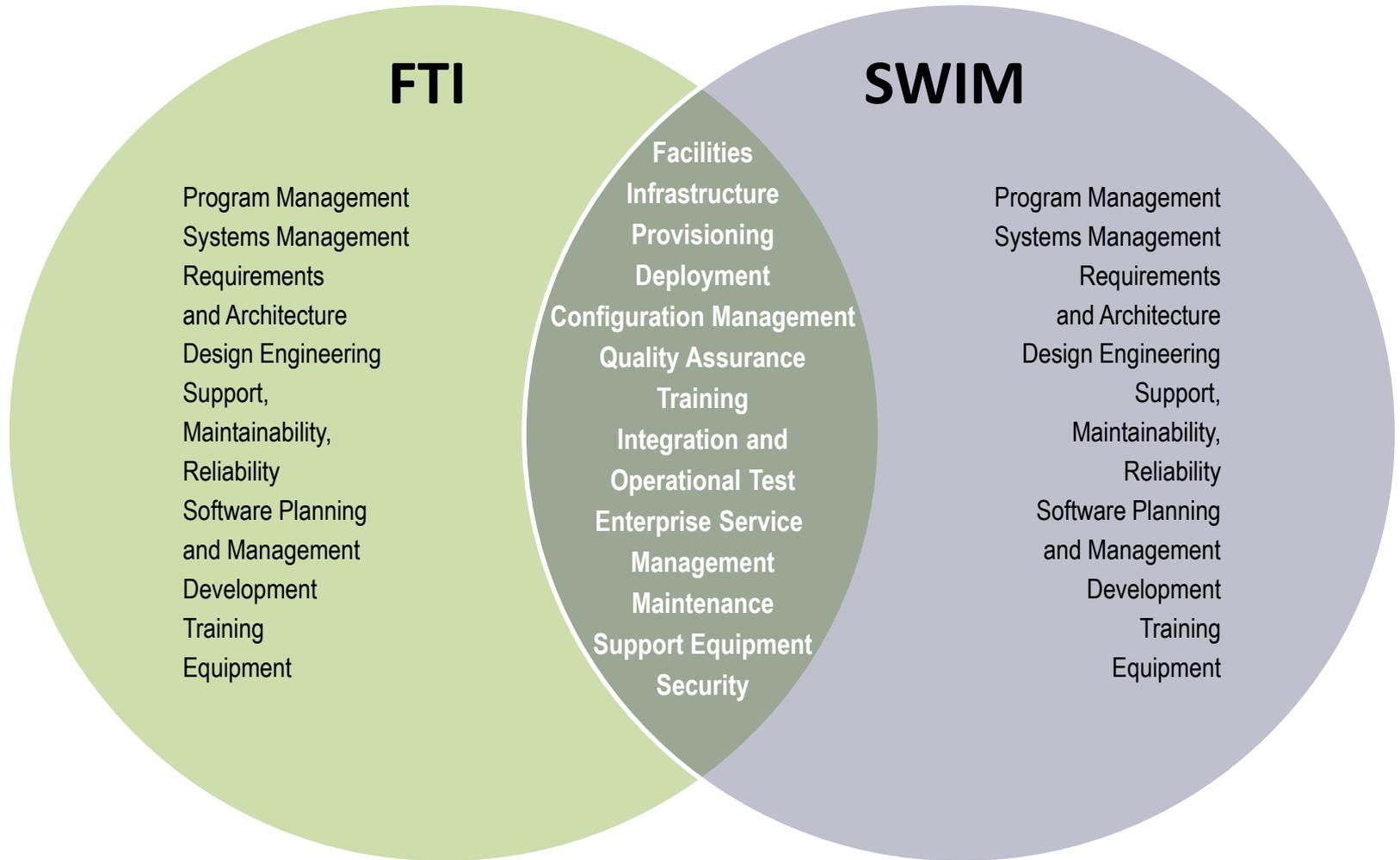
For further information:

<https://www.faa.gov/nextgen/media/futureofthenas.pdf>

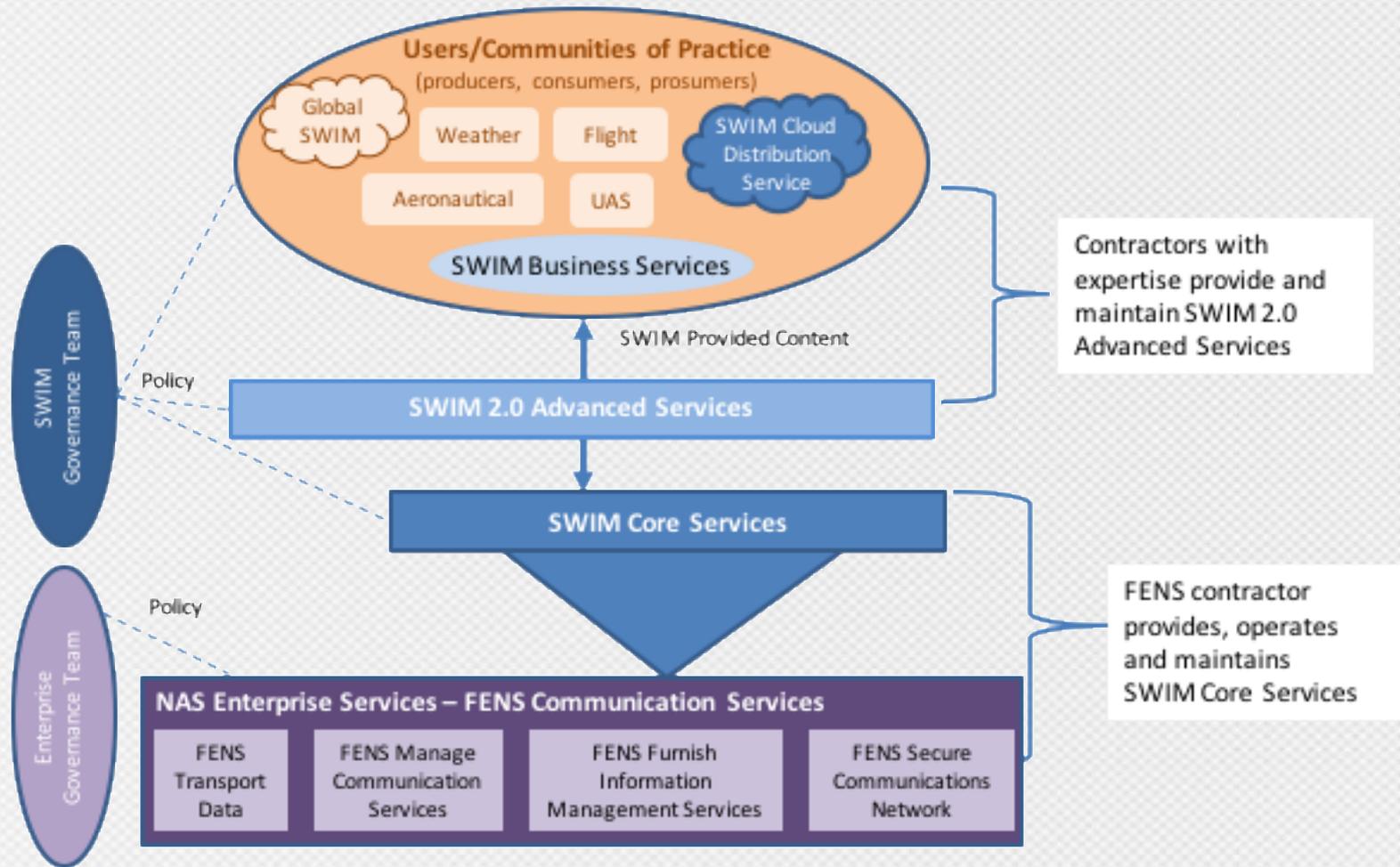
# SWIM Information Services



# SWIM Leveraging FTI Capabilities



# SWIM Segment 3 Operational Concept



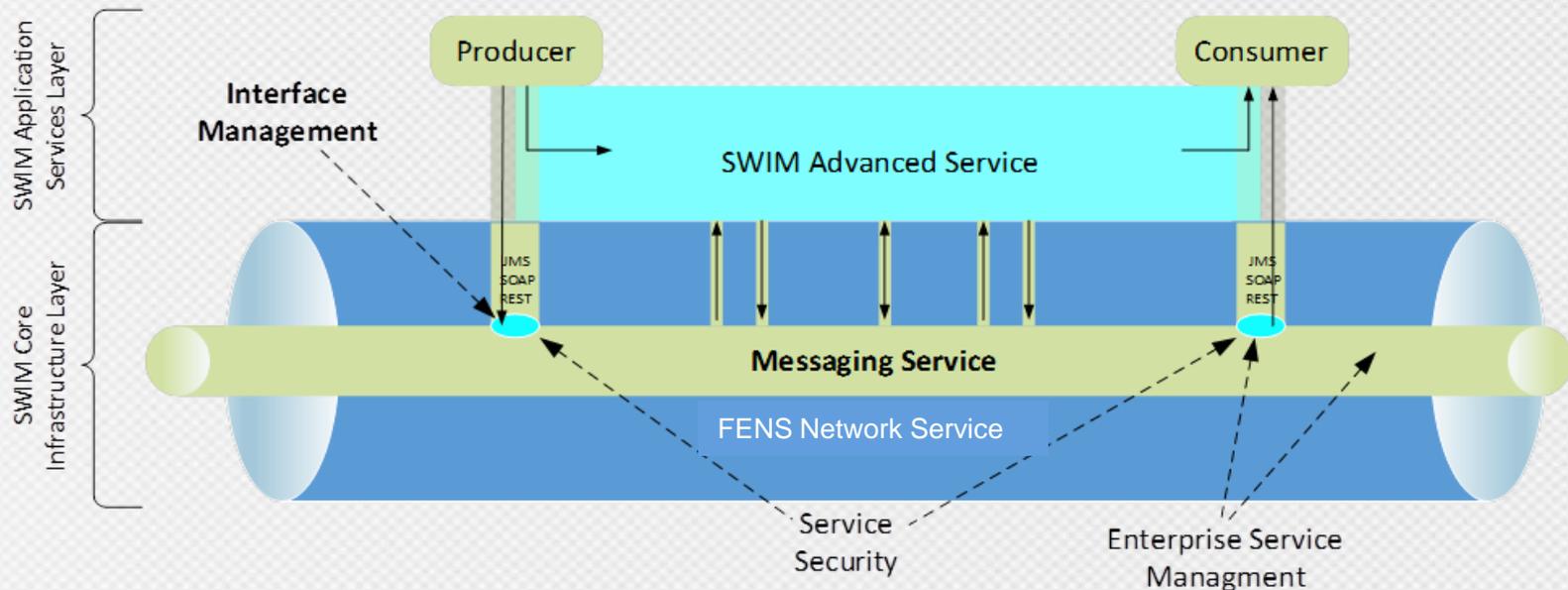
# FENS and System Wide Information Management

## Provisioning of Core SWIM Services

- Innovation in continuing NAS Messaging Service and Interface Management
- Enhancements in Enterprise Service Management & Service Security

## Integration and Support of Advanced SWIM Services

- Examples include Advanced Mediation, Transformations and Smart Services
- Acquisition approach (dependency on FENS) is still being refined



# SWIM Core Services Future Objectives

- Highly Scalable Messaging Service Architecture to reduce cost of scaling system capacity as needed to support increased workloads.
- Increased Service Availability and Reliability provides support for efficiency-critical services.
- Improved Situational Awareness of SWIM Service Status to reduce SWIM service downtime and associated impacts to users.
- Effective Leveraging of Evolving Enterprise Services reduces SWIM development and support costs.
- Automated Provisioning reduces support costs for provisioning SWIM infrastructure, services, and user on-ramping.
- Service Utilization Tracking provides metrics to determine SWIM service utilization on an individual consumer basis.

# Question Submission

We will have a question and answer session in the afternoon.

Please write your questions on the cards provided. They will be collected at the end of each session.

Dennis Scanlon | Contracting Officer, FENS

---

# What's Next? FAA's Plans for FENS

# FAA FENS Acquisition Process

## Market Analysis will continue until Final SIR

- AMS 3.2.1.2.1 – Formal and documented by the program
  - Comments from industry and other outreach
- Meetings - Time consuming. FAA *MAY* do additional meetings

## Communications with Offerors

- AMS 3.2.2.3.1.2.2
  - Throughout competition
  - May continue throughout as required, *at the discretion of the service organization*
  - *Communications with one offeror do not necessitate communications with other offerors since communications will be offeror-specific*
  - Ensures mutual understanding
  - Oral or written information disclosed may be considered in the evaluation of an offeror's submittals
  - **Ensures communications do not afford any offeror an unfair competitive advantage**
  - Offerors are encouraged to provide suggestions about all aspects of the procurement
  - When communications necessitate requirements changes, AMS 3.2.2.3.1.2.4 applies
    - No changes necessitated - no requirement to request or accept proposal revisions

# FAA FENS Acquisition Process

## Maintain Competition – FAA’s Focus

- AMS 3.2.1.3.6

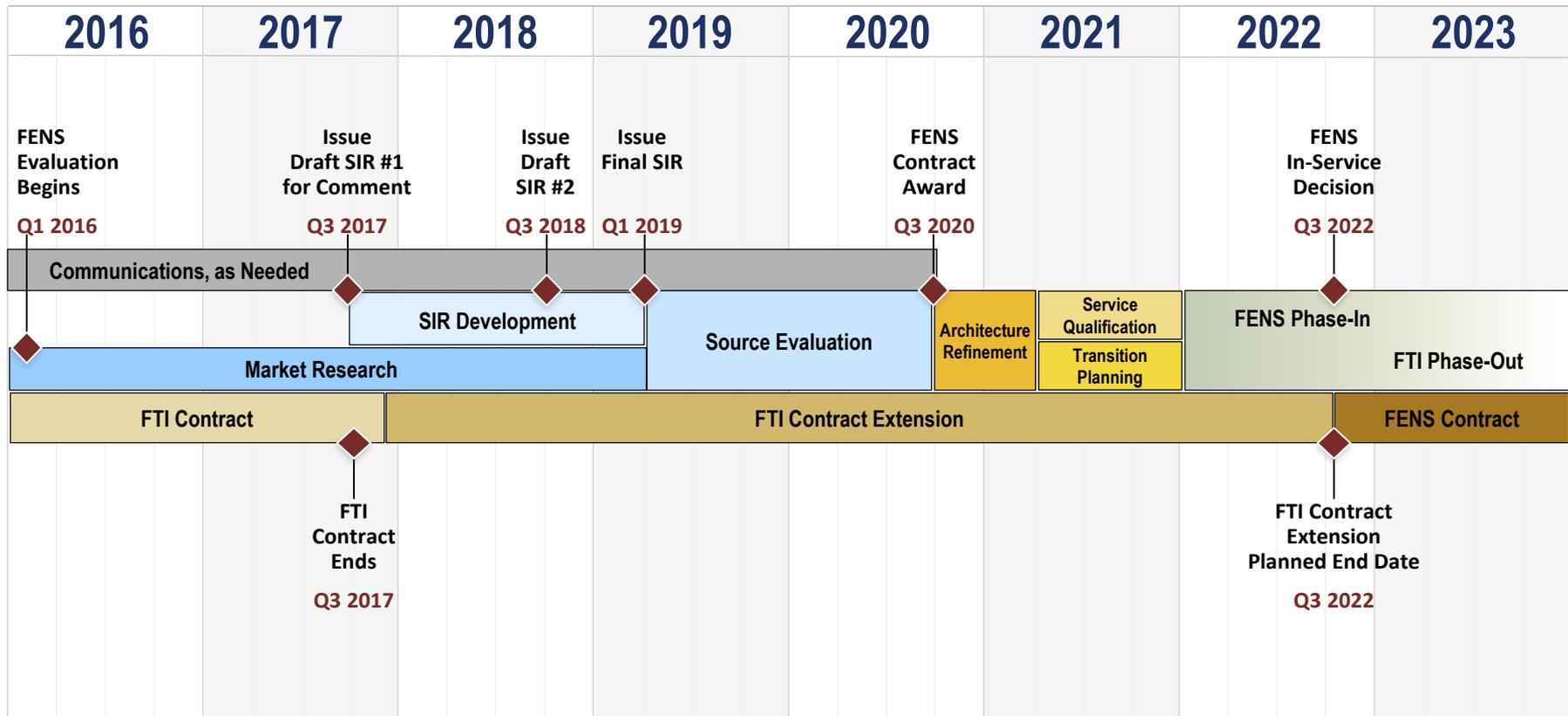
## Pre-Release of Documents

- AMS 3.2.1.3.8 – Early and more complete releases of the SIR and feedback from industry should be part of the market analysis strategy.

## Public Announcements

- AMS 3.2.1.3.11.1 – Public announcement on the Internet (FAACO) or through other means.

# FENS Acquisition Target Dates (CY)



# Near-Term Acquisition Events



- Communications will be ongoing, at the discretion of the FAA
  - AMS 3.2.2.3.1.2.2

- Release Draft SIR #2, target July 2018

- Final SIR, target Q1 2019

## Interested Vendor List

- Based upon today's attendance
- AMS 3.6 Socio-Economic and other Policies and Programs

# Draft SIR #2– *What to Expect*

- **LAST Draft – Speak Up!**
- **Updates to Draft SIR #1 section**
  - Statement of Work (Section C)
  - Pricing (Section B)
  - Functional and Performance Specifications
  - Special Contract Requirements (Section H)
- **New sections appearing in Draft SIR #2**
  - Section L (Program Submission Requirements)
  - Section M (Evaluation Factors)
    - Expect specific evaluation criteria
  - J attachments (e.g. Service Delivery Locations & CDRL List)



# Other Key Elements of the SIR

## ○ Price Evaluation Tool

- Under development
- Intend to obtain comments before final SIR release
- Expected to include a representative list of services (a.k.a. traffic models) for pricing by Offerors

## ○ Deliverable Requirements

- Data Item Descriptions (DIDs) may not be available until the Final SIR

## ○ Security Sensitive Information (SSI)

- There will be special handling requirements for any government information included in the SIR that is SSI (e.g., detailed security requirements)
  - Released only to prime offerors, who will be able to share based on restrictions and
  - Subject to non-disclosure agreement

# SIR Components

## ○ Written proposals

- Technical/Management
- Cost/Price
- Past Performance
- Small Business Subcontracting Plan
- Miscellaneous (Business Declarations, etc.)

## ○ SIR components under consideration:

- Oral presentations
- Vendor site visits
- Capability Demonstrations (conducted by the Offerors)
- Capability Assessments (performed by the Government)

# Summary

- **All communications regarding the FENS solicitation directed to the CO**
  - E-mail: [9-AJW-FTI2Info@faa.gov](mailto:9-AJW-FTI2Info@faa.gov)
- **Updates – FAACO and FAA website**
  - FAA Website:  
[https://www.faa.gov/air\\_traffic/technology/cinp/fti2/](https://www.faa.gov/air_traffic/technology/cinp/fti2/)
  - FAACO Home Page: <https://faaco.faa.gov/>
    - The official source, and the one to rely upon for information
- **FAA Focus is on maintaining competition**

# Question Submission

We will have a question and answer session in the afternoon.

Please write your questions on the cards provided. They will be collected at the end of each session.

Steven Bradford | Chief Scientist, NextGen, ANG-3

---

# Closing: Network of the Future

---

# Questions and Answers

# Closing Thoughts

Engagement with industry so far has been  
**ENTHUSIASTIC** and **ROBUST**

Continued engagement and ideas from industry  
are critical to the success of FENS.



Thank you!

---

# Additional Program Information

[https://www.faa.gov/air\\_traffic/technology/cinp/fti2/](https://www.faa.gov/air_traffic/technology/cinp/fti2/)



FAA Enterprise Network Services (FENS)  
Industry Day—April 25, 2018



Federal Aviation  
Administration