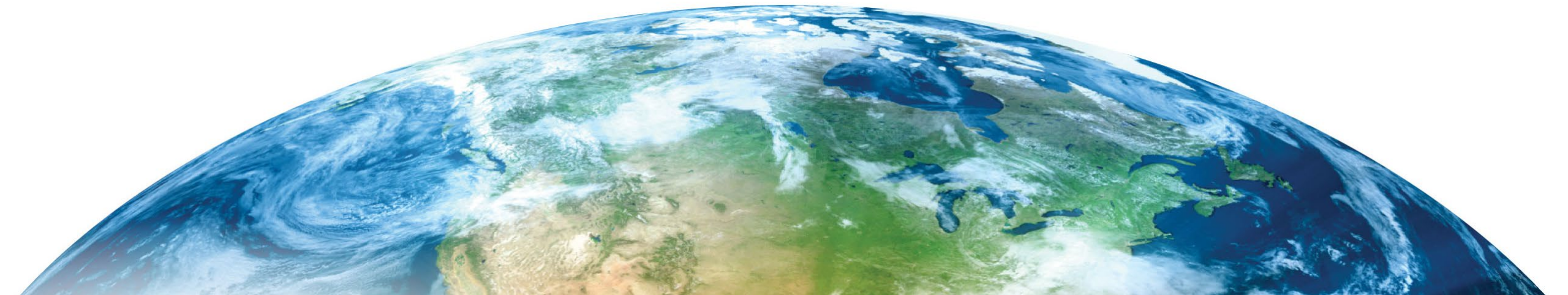




Next**GEN**

# Enterprise Architecture (EA) Informational Briefing

REDAC - NAS Operations Subcommittee Meeting  
August 30, 2022



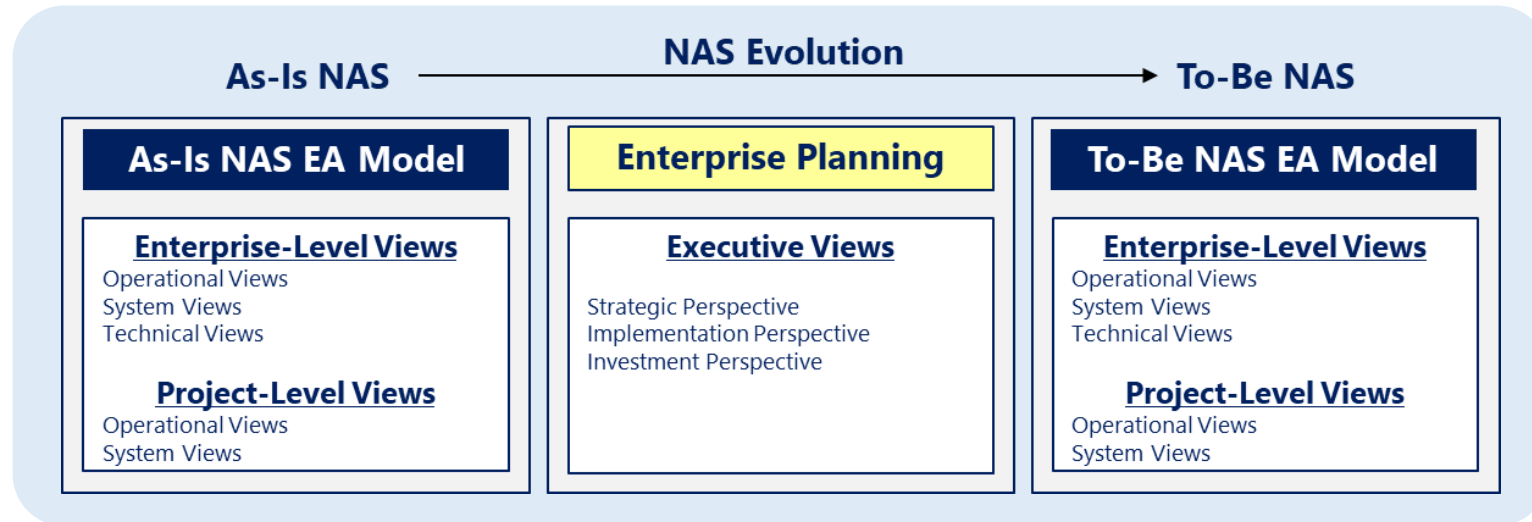
# Agenda

- NAS EA Overview
  - NAS EA Defined
  - NAS EA Purpose
  - Enterprise-Level Planning
- Alignment and Traceability
- References
  - NAS Systems Engineering Portal
  - Points of Contact



# NAS EA Defined

- The NAS EA is a set of models and views that **documents the NAS in the current state**, the **desired future state**, and the **transition strategy** between the two



- The EA includes a series of roadmaps and implementation plans that communicate strategic improvements to the NAS over time, and the supporting research, operational concept development, and capital investment activities that enable them
- The NAS EA is updated annually, with the next Update Cycle scheduled to kickoff September 12, 2022

# NAS EA Purpose

***Sets target state of the NAS and tracks progress against that future vision***

Evolves with Agency strategies in response to changing priorities, emerging technologies, and future concepts

***Provides Systems Engineering guidance to FAA investments traversing the AMS***

Provides guidance, input, and oversight of project-level architectures to ensure alignment with Agency strategies

***Informs and supports the FAA investment decisions boards (JRC, CIT)***

Provides data and analysis to support investment board decisions

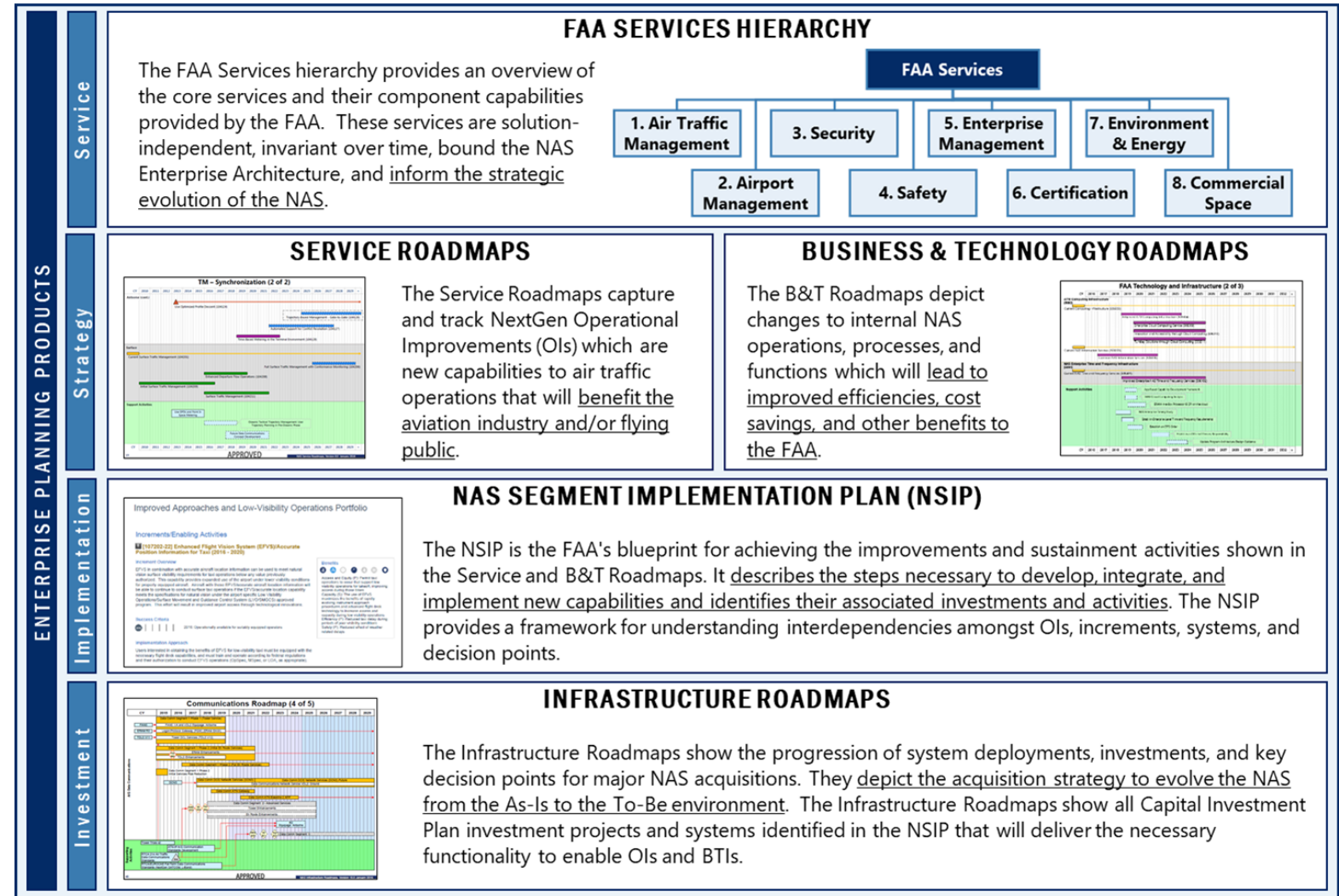
***Complies with Federal Enterprise Architecture (FEA) mandates***

FEA is mandated by a series of Federal laws



# Enterprise-Level Planning

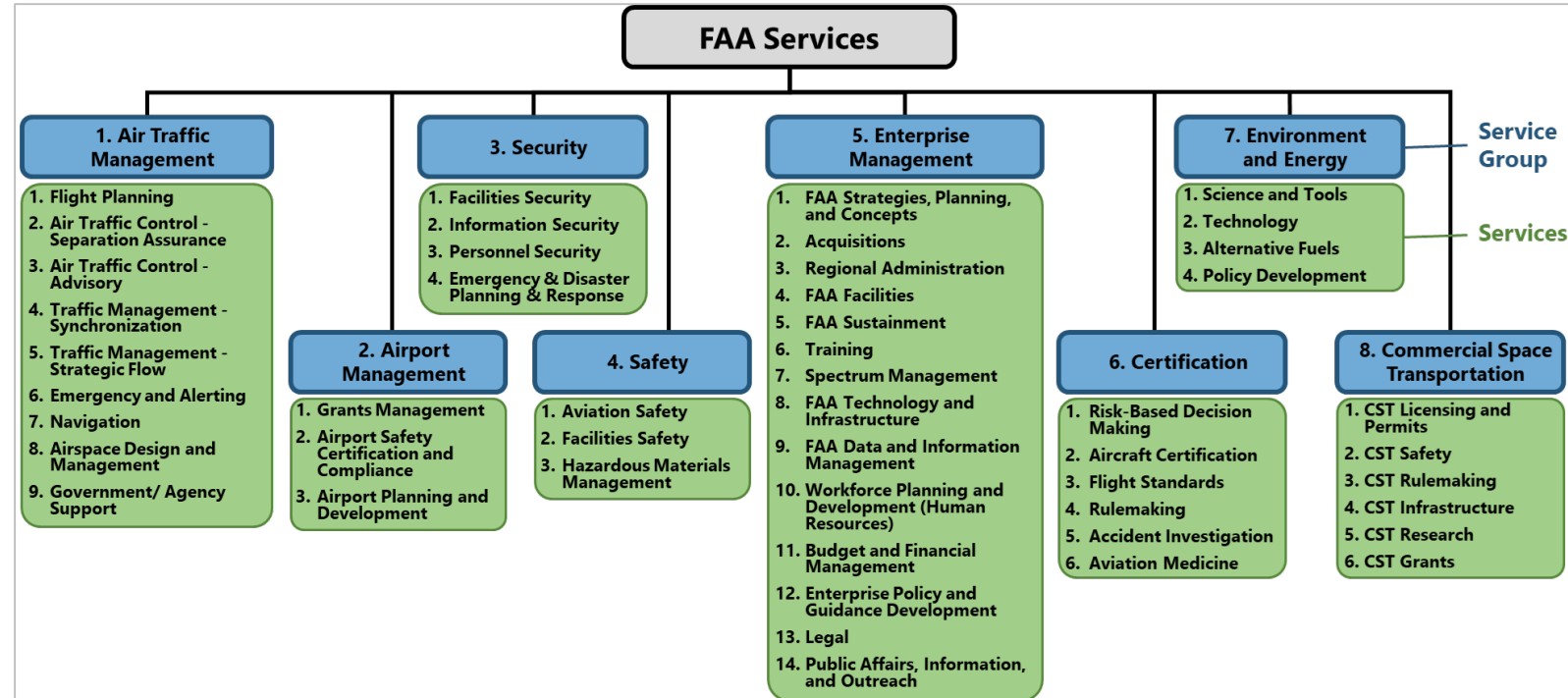
- The NAS EA provides enterprise-level planning products to show the transition strategy for the future state of the NAS
- These are structured in a hierarchy consisting of four layers
  - **Service**
  - **Strategy**
  - **Implementation**
  - **Investment**





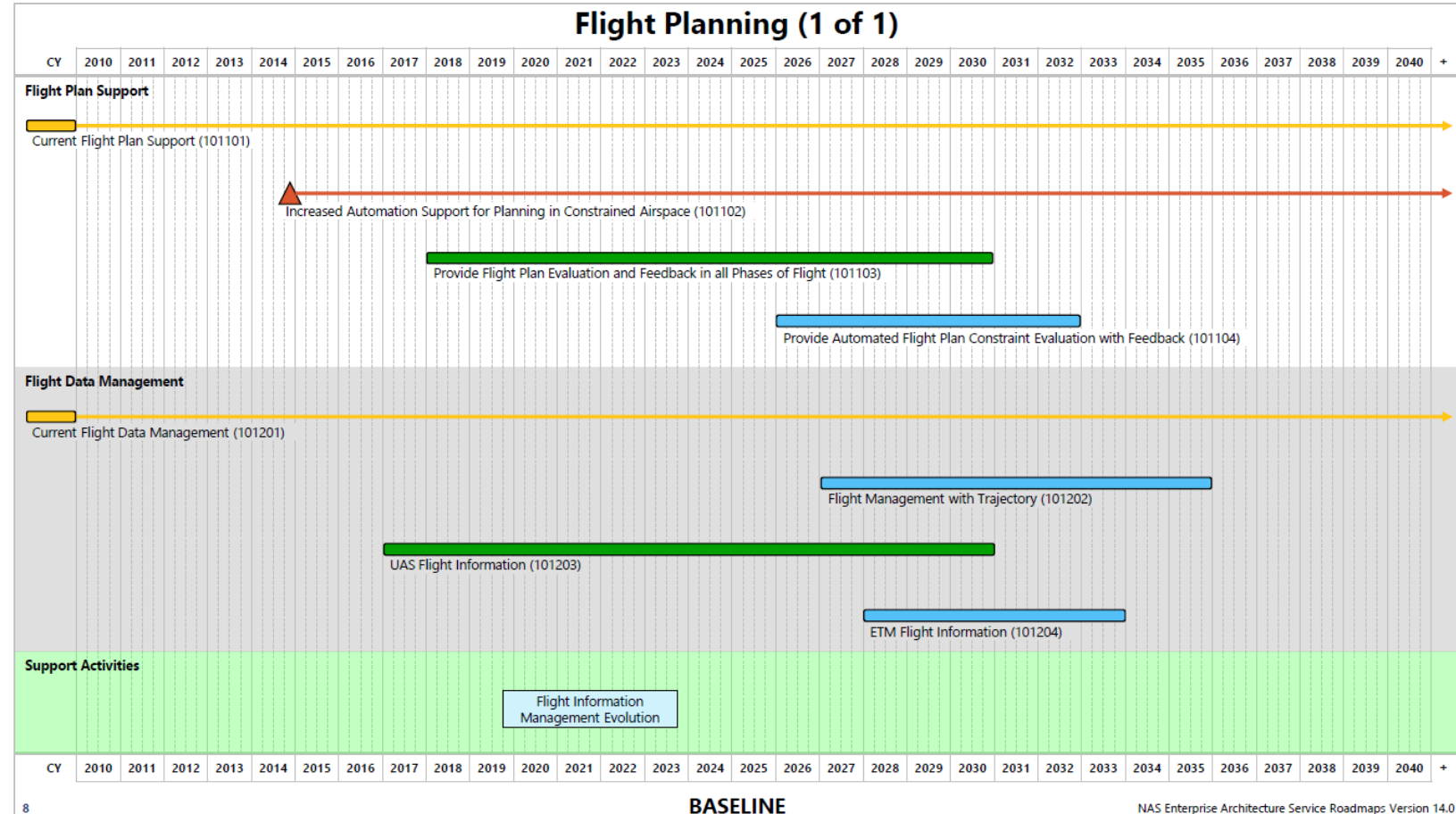
# FAA Services Hierarchy

- FAA Services are the **processes and capabilities the agency provides** – both internally and externally – **to satisfy mission needs**
- FAA Services (in green) are organized by FAA Service Groups (in blue). Each FAA Service is broken down into Service Capabilities (not shown), which are the foundations for:
  - Operational Improvements
  - Business & Technology Improvements



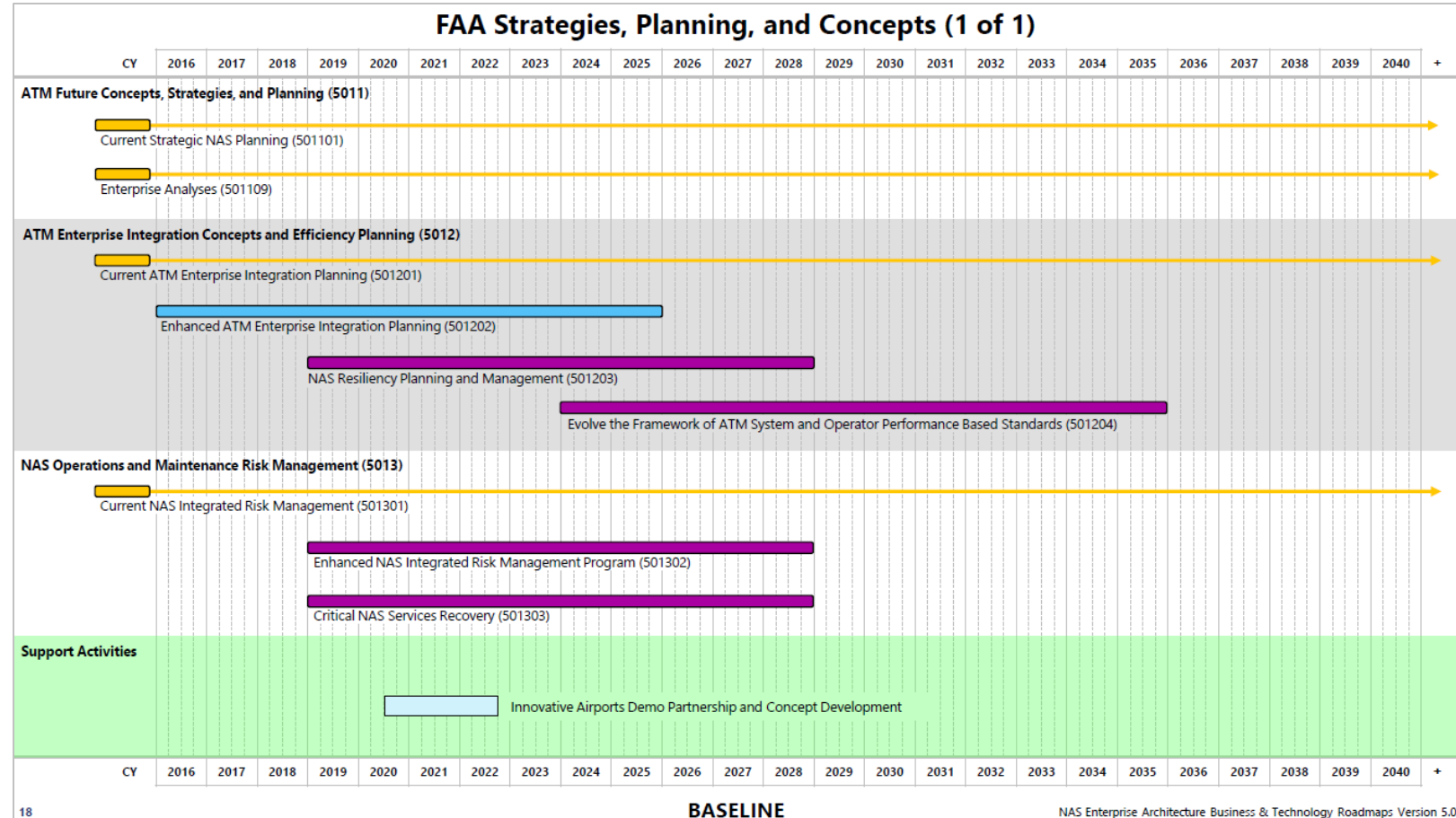
# Service Roadmaps

- The Service Roadmaps depict the availability timeframes of **operational capabilities** that benefit the aviation community
- They also include relevant Support Activities which are generally **research and operational concept development** activities that support the identification and evolution of new capabilities



# Business & Technology (B&T) Roadmaps

- The B&T Roadmaps depict the availability timeframes of **changes to business processes and functions** that benefit the FAA
- They also include relevant Support Activities which are generally **research and technical development** activities that support the identification and evolution of new capabilities

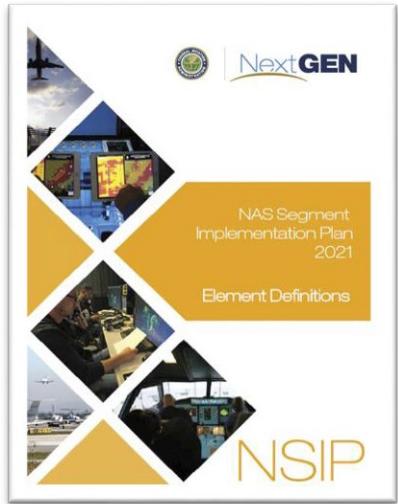




- The NSIP is the FAA's blueprint for achieving goals of NextGen and the Info-Centric NAS
- Provides the bridge between strategy and investment
- Decomposes the operational improvements tracked on the Service Roadmaps and **identifies implementation strategies and required systems**

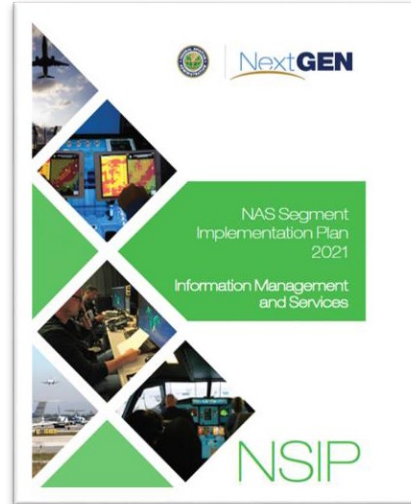


# NSIP Appendices



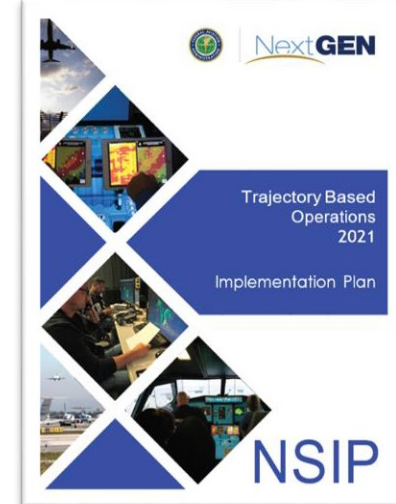
## Element Definitions

The NSIP Element Definitions document provides definitions for the various components of the NSIP; Portfolios, OI and Increment elements (e.g., Benefits, Status, Success Criteria, Segment, etc.)



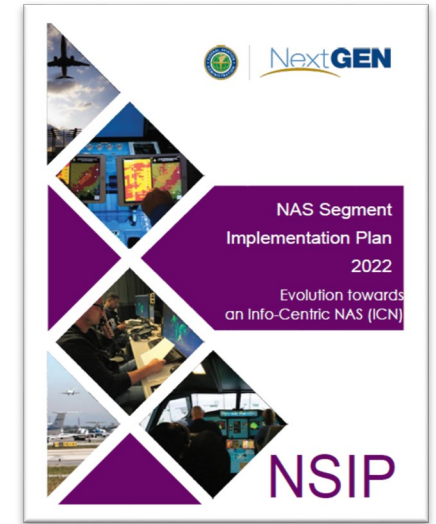
## Information Management and Services

The NSIP Information Management and Services document is an annex to the overarching NSIP. It focuses on the NextGen information management and services associated with current and future NextGen capabilities. This document also describes the improved information management standards and interoperability across various applications.



## TBO Implementation Plan

As the FAA moves forward in delivering TBO, it is important to establish a common understanding of the building blocks that must be assembled to achieve the operational change envisioned. While the NSIP and its OIs and increments do this at detailed level, the Path to TBO has been developed to convey a higher-level view of the themes in which operational changes and the associated dependent technical capabilities are being developed and deployed.

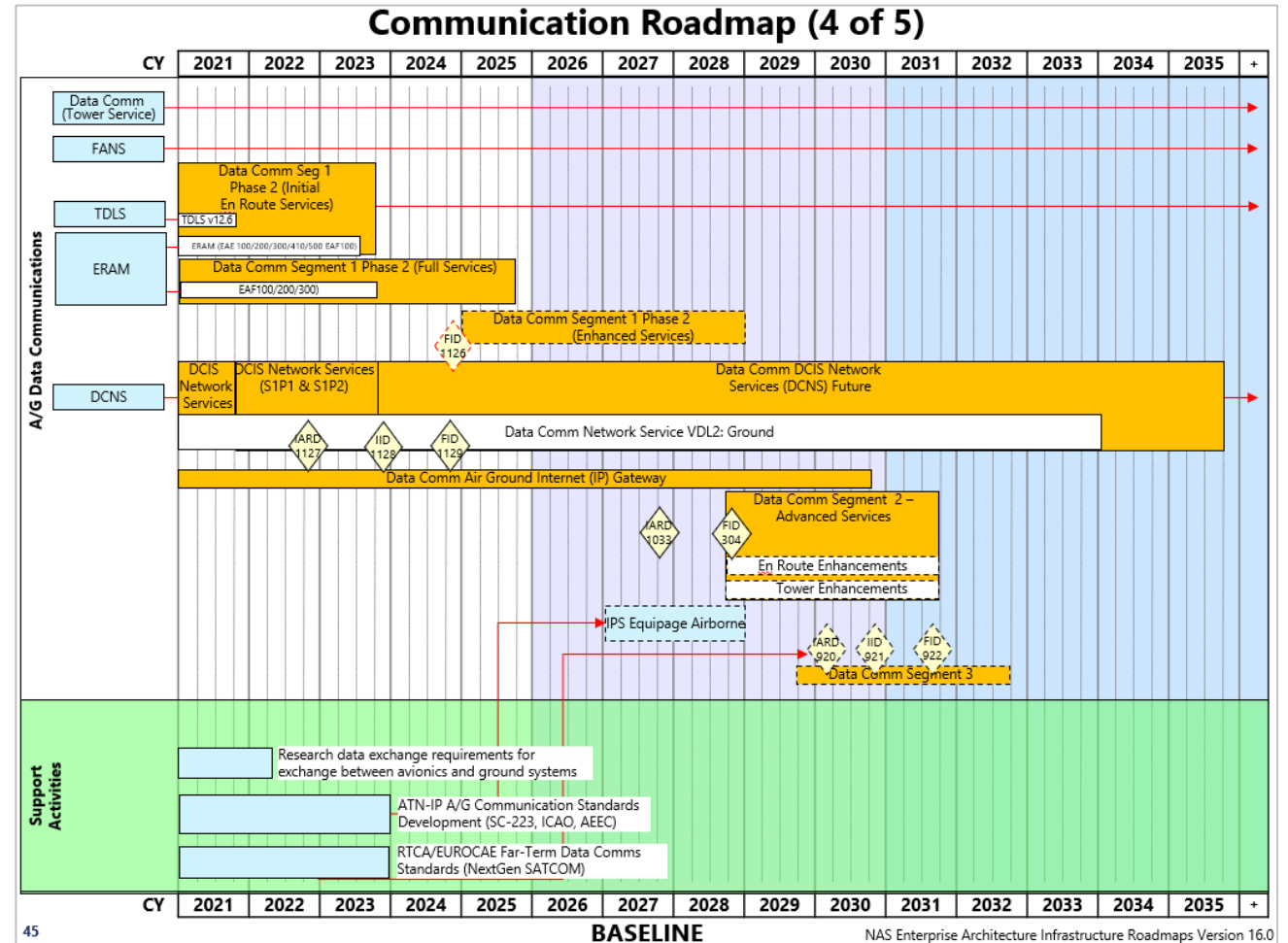


## Evolution towards an Info-Centric NAS (I-CN)

A high-level description of the future evolution of the NAS to complement the Charting Aviation's Future: Operations In An Info-Centric NAS vision document. This Appendix describes the ongoing, planned, and future improvement needs to reach the envisioned state.

# Infrastructure Roadmaps

- The Infrastructure Roadmaps provide an overview of FAA **system deployment, sustainment, and investment schedule**
- Depicts the **F&E funding plan** for CIP projects and systems, and **AMS milestones** and solution-focused support activities



# Support Activities

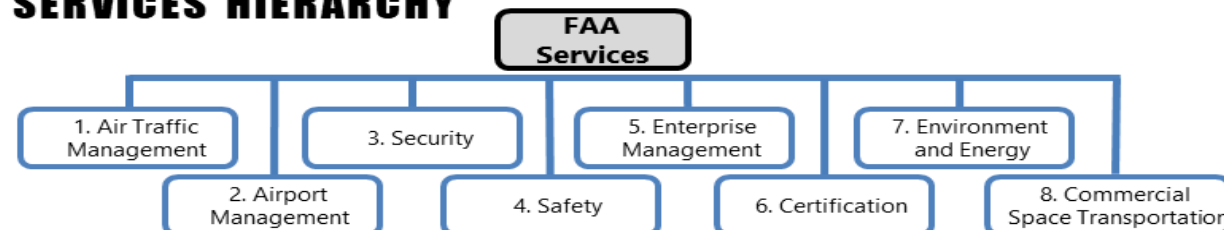
- A Support Activity is any **pre-implementation activity undertaken by the FAA or external partner to increase the likelihood of success of a primary activity on a roadmap**
  - Support Activities are undertaken to develop and validate operational concepts (Service and B&T Roadmaps) and technical solutions (Infrastructure and B&T Roadmaps)
- Support Activities are used to track research activities to show progress against future visions and strategies, such as I-CN



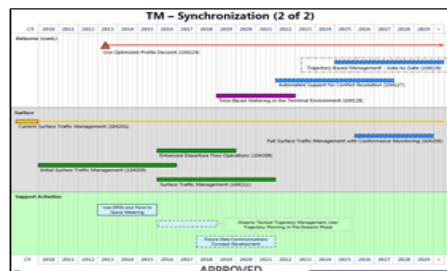


# FAA SERVICES HIERARCHY

The FAA Services Hierarchy provides an overview of the core services and their component capabilities provided by the FAA. These services are solution-independent, invariant over time, bound the NAS Enterprise Architecture, and inform the strategic evolution of the NAS.



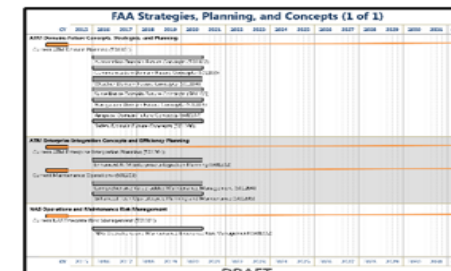
## SERVICE ROADMAPS



The Service Roadmaps capture and track NextGen Operational Improvements (OIs) which are new capabilities to air traffic operations that will benefit the aviation industry and/or flying public.

## BUSINESS & TECHNOLOGY ROADMAPS

The B&T Roadmaps depict changes to internal NAS operations, processes, and functions which will lead to improved efficiencies, cost savings, and other benefits to the FAA.

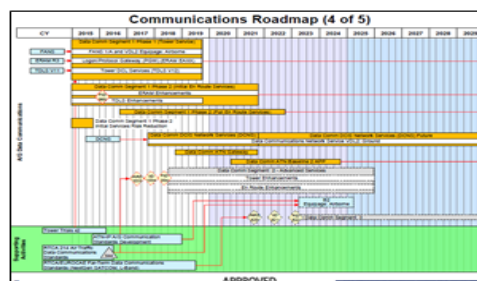


## NAS SEGMENT IMPLEMENTATION PLAN (NSIP)



The NSIP is the FAA's blueprint for achieving the improvements and sustainment activities shown in the Service and B&T Roadmaps. It describes the steps necessary to develop, integrate, and implement new capabilities and identifies their associated investments and activities. The NSIP provides a framework for understanding interdependencies amongst OIs, increments, systems, and decision points.

## INFRASTRUCTURE ROADMAPS



The Infrastructure Roadmaps show the progression of system deployments, investments, and key decision points for major NAS acquisitions. They depict the acquisition strategy to evolve the NAS from the As-Is to the To-Be environment.

The Infrastructure Roadmaps show all Capital Investment Plan investment projects and systems identified in the NSIP that will deliver the necessary functionality to enable OIs and BTIs.



# Integrating Info-Centric NAS Concepts into the NAS EA

- Improvements from the Info-Centric NAS vision document are integrated in the NAS EA in the form of Operational Improvements (OI's) and Business and Technology Improvements (BTI's). These serve as the strategic direction of NAS evolution.
- NextGen EA teams determine research activities required to achieve the OI or BTI and are captured in the form of Support Activities in the NAS EA.
- The Info-Centric NAS OI's, BTI's, and Support Activities are displayed in multiple NAS EA roadmaps.
- The alignment between the Support Activities and the OI's and BTI's are best displayed in tabular form and are captured in the NAS Segment Implementation Plan 2022 Evolution towards an Info-Centric NAS.

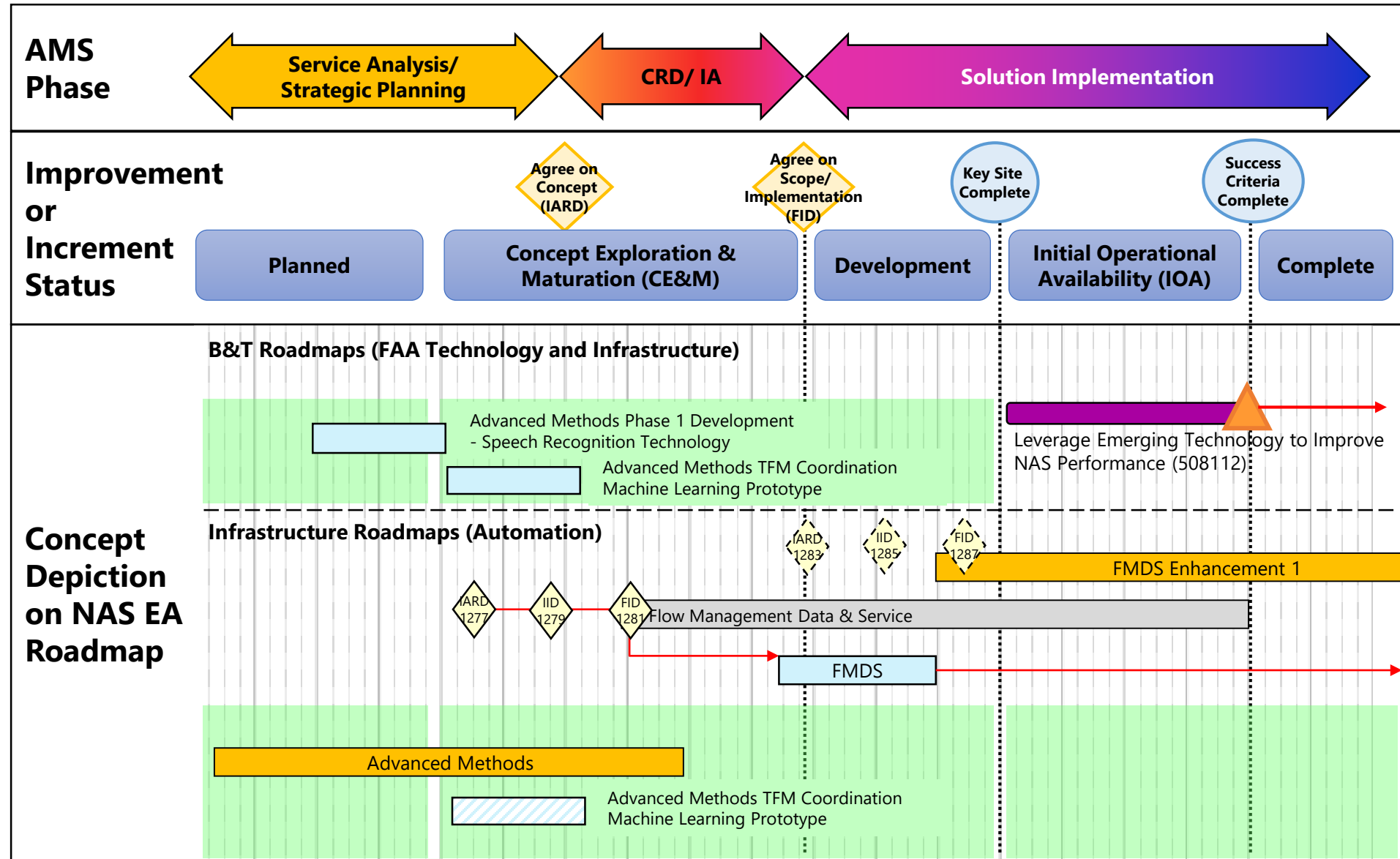
Infrastructure Pillar – Information			
Projects	FY2021	FY2022	FY2023+
BTI 508112 Leverage Emerging Technology to Improve NAS Performance (2024-2032)			
Advanced Methods	✓ Developed concept for use of speech recognition in TFM coordination	• Develop prototype capability for advanced automation learning/data mining capability that utilizes historical and real-time data	• Develop AI TFM Learning Capability

**Example alignment of Advanced Methods to BTI 508112: Leverage Emerging Tech to Improve NAS Performance**

# Tracing ICN Concepts Across Roadmaps

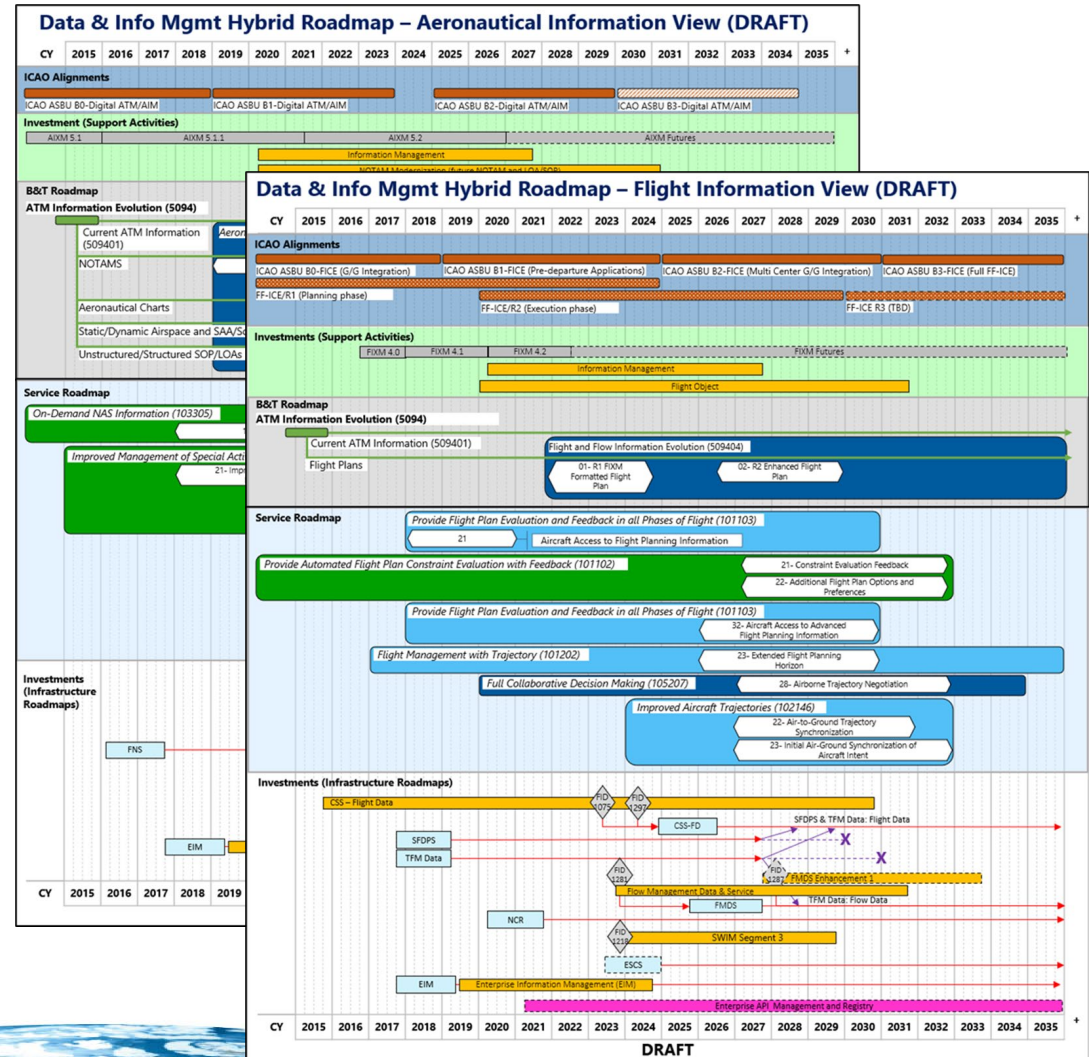
## The full lifecycle of a concept spans Roadmaps

1. Early concept research is first shown on Service/ B&T Roadmaps as Support Activities or on Infrastructure Roadmaps as G-CIP (planned or funded)
2. Future OI or BTI also shown on Service and B&T Roadmaps
3. The systems Investments, Support Activities, Decision Points required to develop the concept are shown on Infrastructure Roadmaps



# Hybrid Roadmaps\*

- Hybrid Roadmaps address the need to present an integrated view of data elements across NAS EA products
- They **aggregate EA data** related to a particular focus area (e.g., Data and Information Management) **into a single diagram**, rather than distributed across multiple products
- Hybrid Roadmaps offer a holistic and integrated view to facilitate communication and planning for a future info-centric NAS



\* Under Development



# NAS Systems Engineering Portal

- The NAS Systems Engineering Portal (SEP) (<https://sep.faa.gov>) is the virtual environment that houses, amongst other things, Enterprise Architecture and NAS Planning information
- The SEP can only be accessed on the FAA network

The screenshot displays the NAS Systems Engineering Portal (SEP) interface. At the top, the MyFAA header includes the Federal Aviation Administration logo, navigation links for About Us, Sign In, Search, and Contact Us, and a welcome message for a guest user. Below the header, a secondary navigation bar lists Products, Browsers, Reports, Resources, and Support. The main content area is titled "NAS Systems Engineering Portal" and features a large graphic with a yellow smiley face character surrounded by question marks and a blue speech bubble with a question mark. A button labeled "Ask SEP" is positioned below the graphic. To the right of the graphic, the "Ask SEP" section provides instructions on how to use the "How May We Help?" form to submit questions, ideas, or bug reports. Below this, an "Explore" button is visible. Further down, the "Systems Engineering by AMS Life Cycle" section is shown, featuring a horizontal flowchart with six phases: Service Analysis & Strategic Planning, Concept & Requirements Definition, Initial Investment Analysis, Final Investment Analysis, Solution Implementation, and In-Service Management. Below the flowchart, an "Interactive AMS Life Cycle Diagram" section explains that a typical investment program within the AMS undergoes a life cycle and provides instructions on how to view a systems engineering perspective on how a solution passes through the various stages of the life cycle. To the right of this, a text block describes the FAA Acquisition Management System (AMS), established in 1996, and provides information on how to access the FAA Acquisition System Toolset (FAST).

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## NAS Systems Engineering Portal

Ask SEP

Ask SEP

Do you need to find specific data on the SEP? Do you have questions about how a feature works? You can use the "How May We Help?" form to send your questions, submit ideas for new data or features, report a bug, or request a data change. Not sure what to ask? We can help find data, navigate products, or find helpful guidance or templates. If we aren't able to provide an answer, we'll connect you with the people who can. All questions are welcome. Simply click the button below to visit the "How May We Help?" page to submit your question or idea.

Explore

### Systems Engineering by AMS Life Cycle

Hide content

Service Analysis & Strategic Planning Concept & Requirements Definition Initial Investment Analysis Final Investment Analysis Solution Implementation In-Service Management

**Interactive AMS Life Cycle Diagram**

A typical investment program within the AMS undergoes a life cycle shown above. Please click on any of the phases to view a systems engineering perspective on how a solution - a program, system, or investment - passes through the various stages of the life cycle.

The FAA Acquisition Management System (AMS) was established in 1996 to address the unique needs of the agency and provide for more timely and cost-effective management of investments in equipment, materials, and services. This policy covers many management disciplines, including strategic planning, budgeting, enterprise architecture, portfolio management, and investment decision-making. Further information on acquisition management policy is available on-line via the [FAA Acquisition System Toolset \(FAST\)](#)

# NAS EA Points of Contact

<b>ANG-B1</b> <b>NAS EA and Requirements Services</b>	<b>ANG-B2</b> <b>NAS Enterprise Planning and Analysis</b>
Models, Views, Requirements	FAA Services Hierarchy, Roadmaps
Kimberly Gill kimberly.gill@faa.gov	Annie Augustin annie.augustin@faa.gov
<b>ANG-B5</b> <b>Systems Engineering Information Management</b>	<b>ANG-C7</b> <b>NAS Lifecycle Planning</b>
Systems Engineering Portal	NSIP
Rita Estrada-Cavallini rita.estrada-cavallini@faa.gov	Vaughn Yates vaughn.yates@faa.gov





# Backup



# Support Activity Types and Definitions

Type	Definition
<b>Operational Concept Exploration</b>	To identify potential and promising new concepts of operations within the NAS environment
<b>Concept Development</b>	Description of a new operational concept (Level I-III)
<b>Operational Research</b>	Research that develops technical or operational artifacts that are needed to determine how a concept will be implemented
<b>Operational Concept Validation</b>	Studies that prove whether or not a concept will meet the operational objectives of the improvement described in the concept
<b>Concept Demonstration</b>	Major demonstrations of new Operational changes to the NAS
<b>Policy Assessment/Development</b>	Assessment of whether policy changes are needed to achieve the operational improvement or to define or develop new policies.
<b>Major Training</b>	Activities to determine how to train the workforce on how to control traffic differently to achieve a new capability
<b>Technical Concept Validation</b>	Validation that a proposed system solution is feasible and will meet the objectives
<b>Technology Opportunity Investigation</b>	Research that determines whether a proposed technical solution is feasible. (e.g. MPAR research)
<b>Technology Demonstration &amp; Prototyping</b>	Demonstrate the technical capabilities of future NAS systems
<b>Standards/Certification Development</b>	Develop or implementing technical standards that may impact current or future NAS systems

