

# FAA NAS Enterprise Architecture

## “Tying it Altogether”

Presented at: NAS EA Conference

By: Jesse Wijntjes / NAS Chief Architect

Date: June 23, 2009



Federal Aviation  
Administration



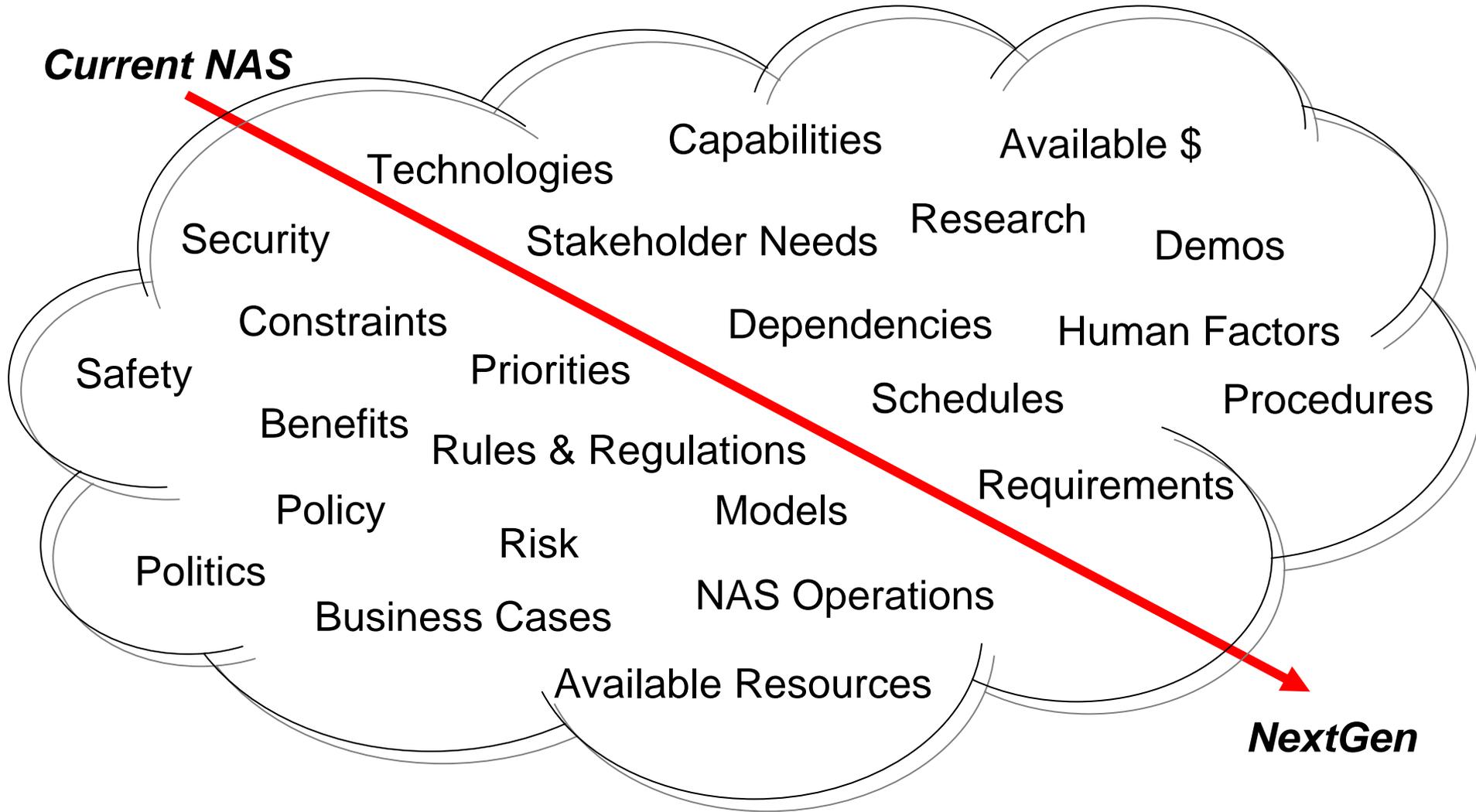
# Outline

- **Introduction & Background**
- **NAS EA Framework**
- **NAS EA Views**
- **NAS EA Alignment and Integration**
- **NAS EA Portal**
- **Discussion and Wrap Up**



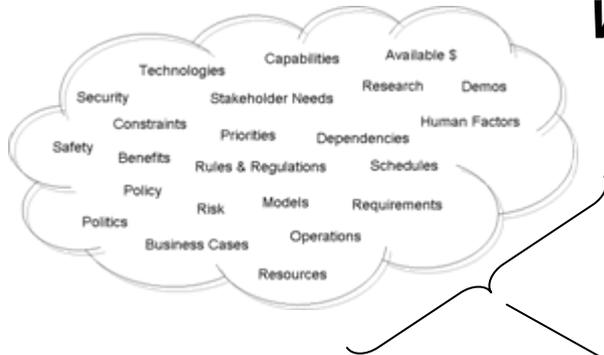
# How Do We Make Sense of This....?

**Current NAS**

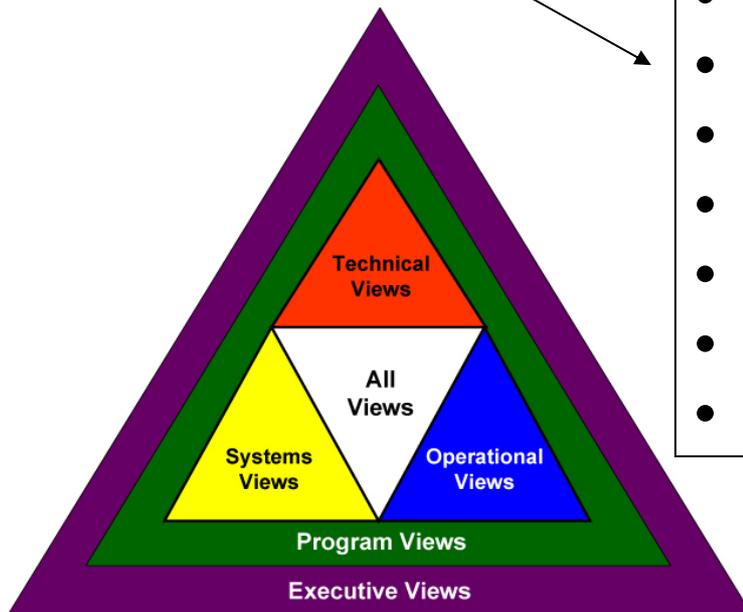


# Manage the Evolution of Your Enterprise...

*Where you are....*



- Implementation Planning
- **Architecture (Views and Roadmaps)**
- Requirements
- Budget & Business Cases
- Modeling & Simulation
- Demonstrations & Prototypes
- Program Management
- Systems Engineering
- Stakeholder Involvement
- Other Activities...



*to where you are trying to go....*

# EA at the FAA – Our Blueprint

- **Enterprise architecture (EA)** provides the **structure** to **relate** organizational mission, vision, and goals to business processes and the technical or IT infrastructure required to execute them
- ***Our EA aligns the FAA's Flight Plan goals, ATO strategic plan, and business plans with the IT investments → Business Case for Expenditures***

- **System architecture** relates requirements and the external world to system structures, including both hardware and software, so that the effectiveness of a system design concept can be communicated
- **Software architecture** relates requirements, fixed system hardware, and infrastructure to software structures in order to demonstrate software effectiveness

Avoid this...!!!



Stairs to Nowhere



Door to Nowhere

# Why EA at the FAA?

People

Process

Technology

Business Rules

- Improve the **alignment** of systems and technologies with the mission/business needs of the operators and the organization
- **Identify** duplication of effort in mission and IT expenditures and facilitate the reduction of investments where applicable
- **Address** the need for increased efficiency in information exchange and interoperability
- **Provide** a common language to facilitate linkages and communications between complex architectures & organizations
- Provide a unifying approach to minimize the burden for the collection, storage, and access to data
- **Facilitate** efficient identification of necessary changes and change implementation
- Helps provide a framework for managing change during spiral and evolutionary development
- And, because it is a requirement from the OMB and GAO

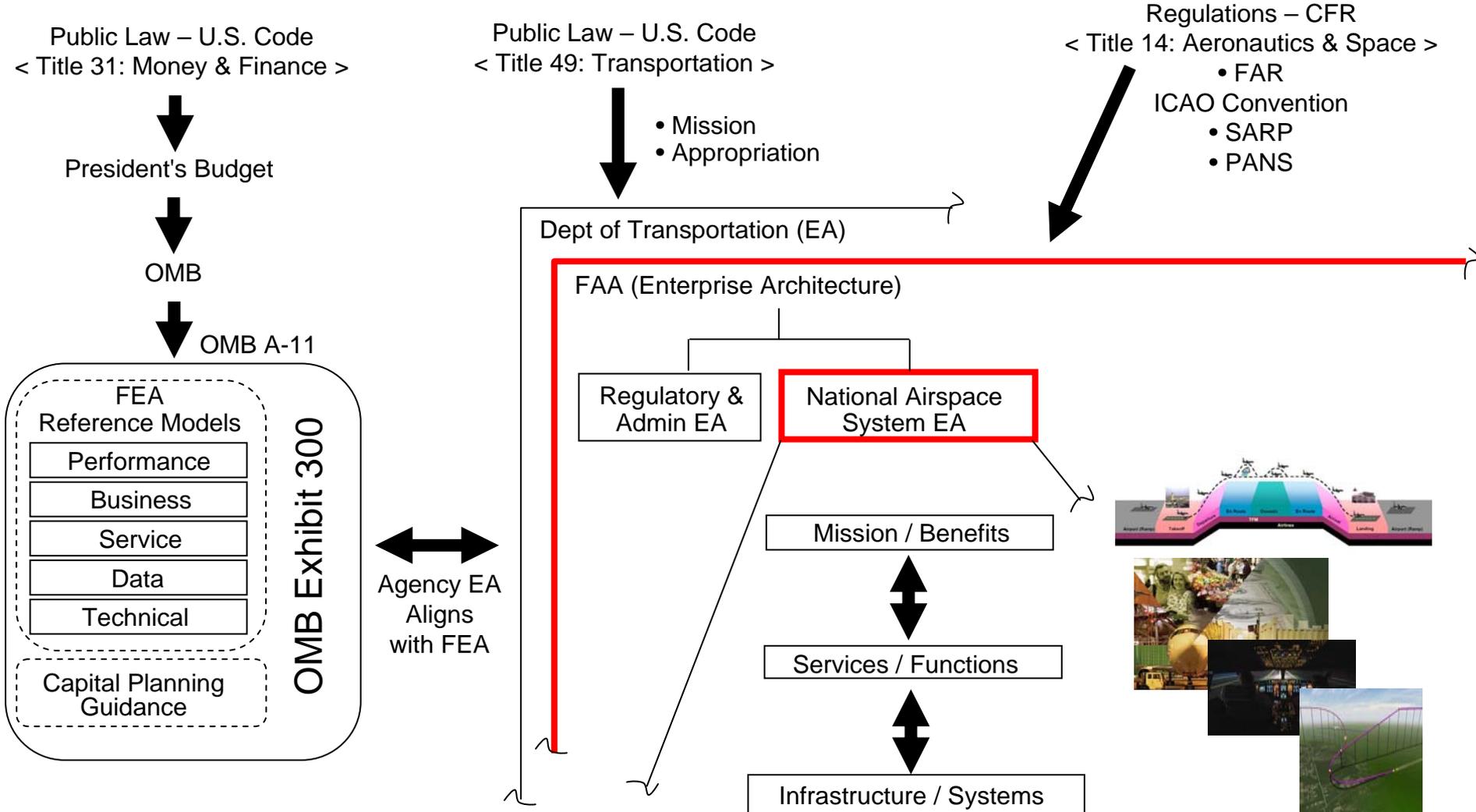


# Enterprise Architecture – Aligning the Mission, Benefits, and Capabilities with Investments

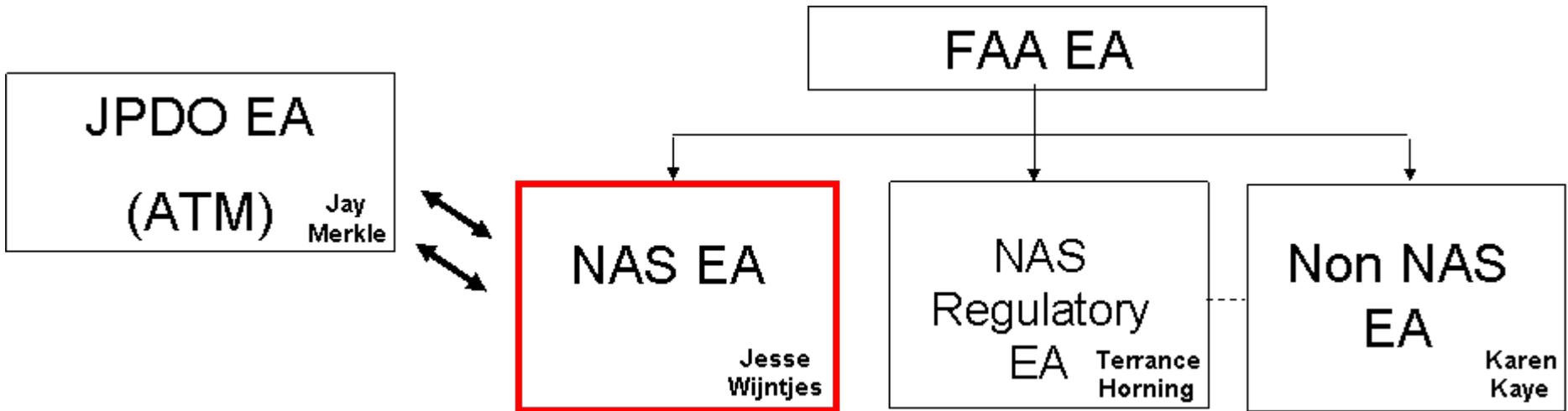
- The FAA has developed and is using an EA to manage the portfolio of investments
- The FAA's EA aligns with the DoT EA and FEA
- The EA contains architecture products and views which describe the current NAS portfolio and the target architecture including the definition of the mid term
- The EA also contains roadmaps to describe the transition from the current portfolio to the target architecture
- The EA is aligned with the Agency's goals and strategic objectives as well as the budget



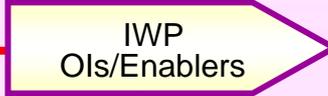
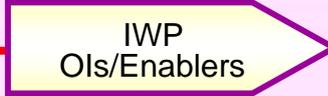
# \$ ↔ Mission ↔ Services ↔ Infrastructure



# FAA Enterprise Architecture



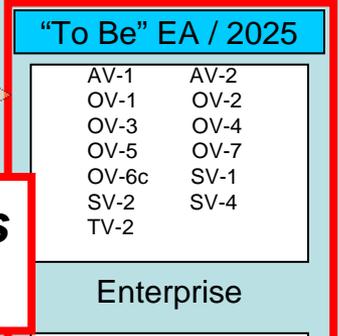
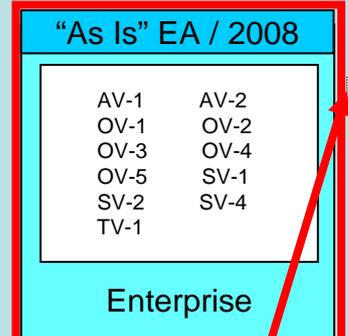
- FAA Enterprise Architecture (EA) has three parts
  - NAS - Activities that support Operational Air Traffic Services
  - Regulatory - Activities that support the FAA Mission
  - Administrative - Activities that support operation of the FAA
- FAA CIO has responsibility for entire FAA EA - Delegates responsibility to develop and implement NAS EA to ATO COO



CONOPS (2025)

2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2022 2023 2024 2025 +

**NAS Level Requirements**

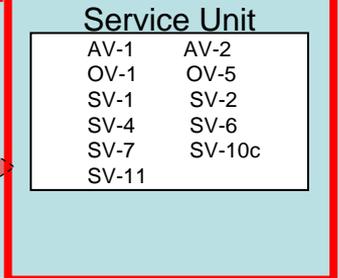
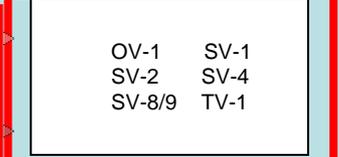
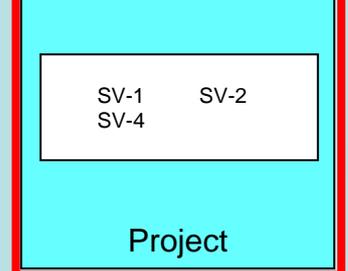


**Stakeholder Benefits**

**Financials**

**NAS Capabilities & Functions**

**Programs & Projects**



FAA – NextGen

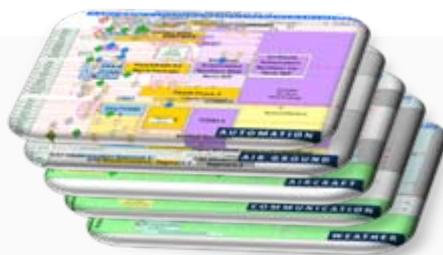
**Where We Are**

**Where We Are Going**

Operational Enhancements and User Benefits (Safety, Capacity, Efficiency, Flexibility)



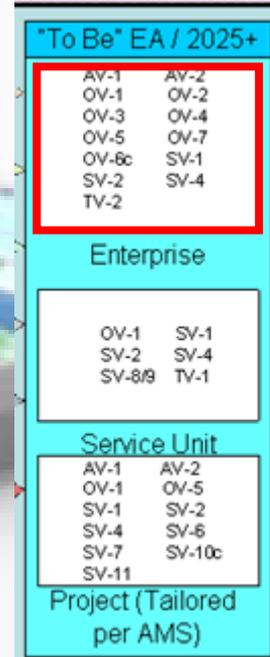
**Current  
2008**



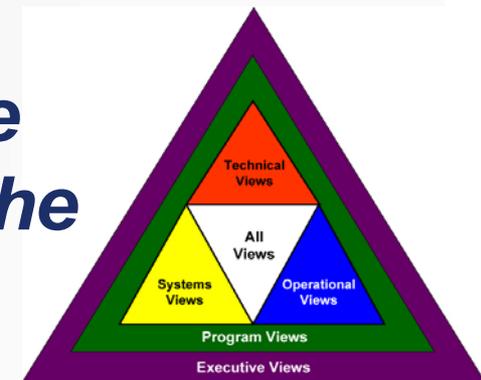
2018

2025

**NextGen  
2025+**



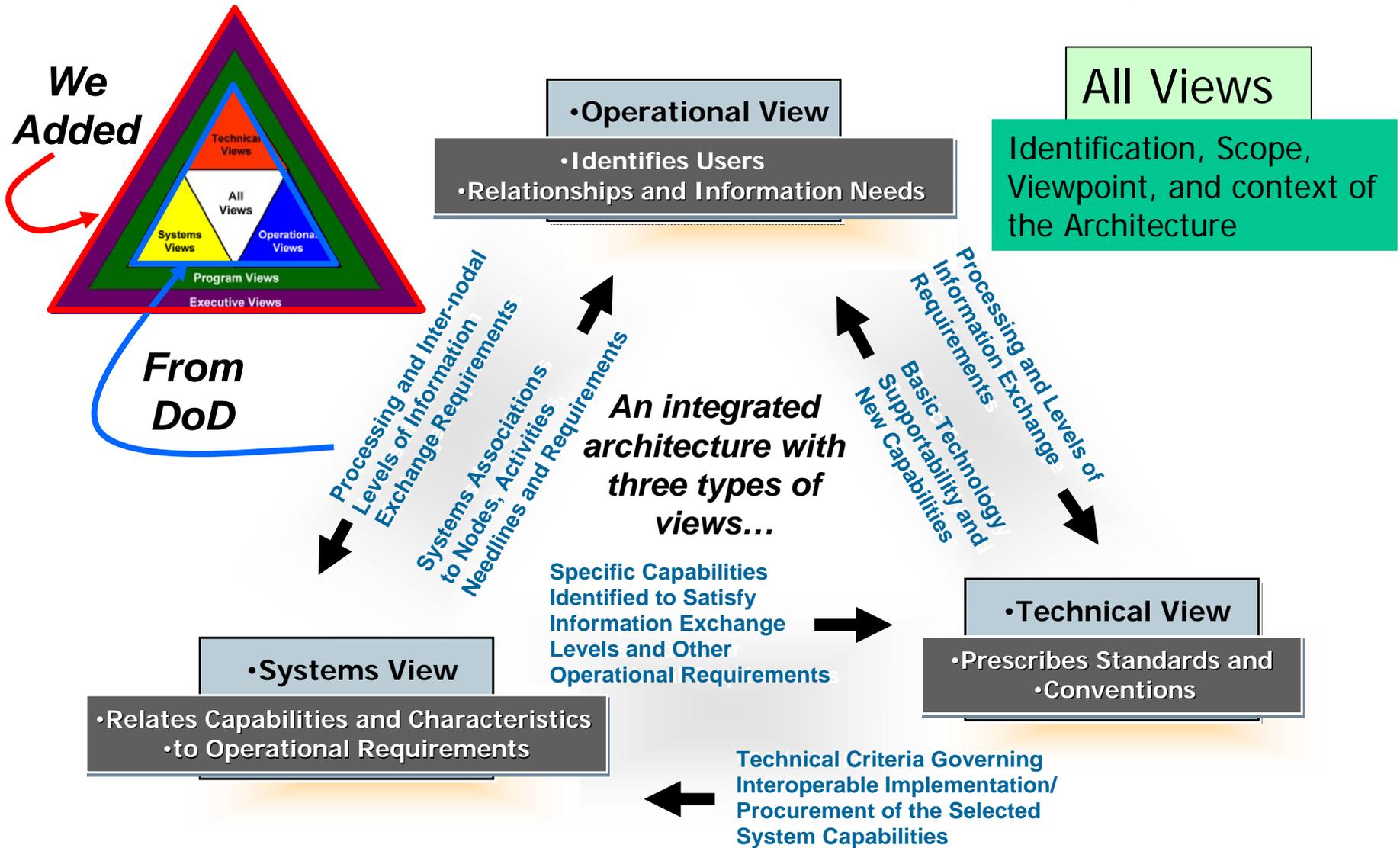
# EA Views Describe the Evolution of the NAS



Associates Team / Review Board  
Aviation Community Partnership

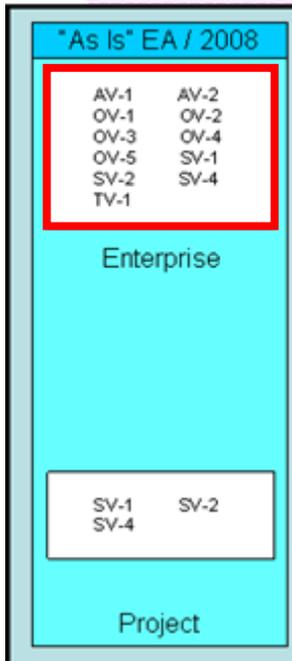


# DoD Architecture Framework (DoDAF)



# Architecture Views Frame the Evolution of the NAS

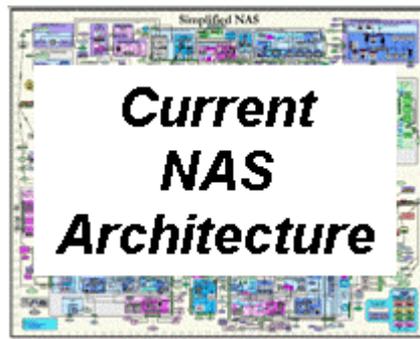
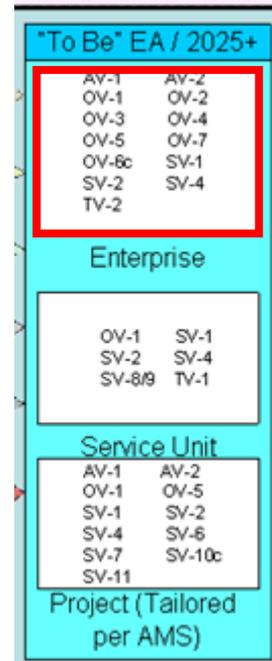
Current  
2008



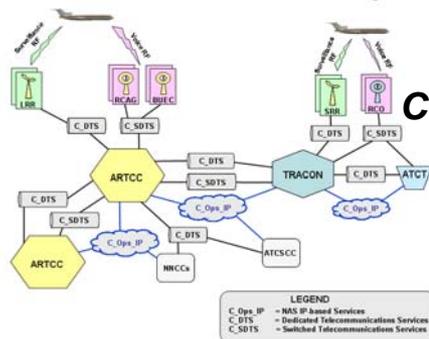
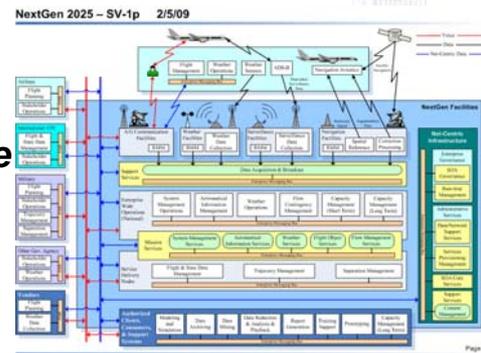
Ops  
Concepts  
→  
OV-1



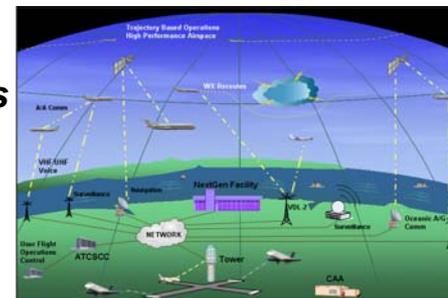
NextGen  
2025+



System  
Architecture  
→  
SV-1



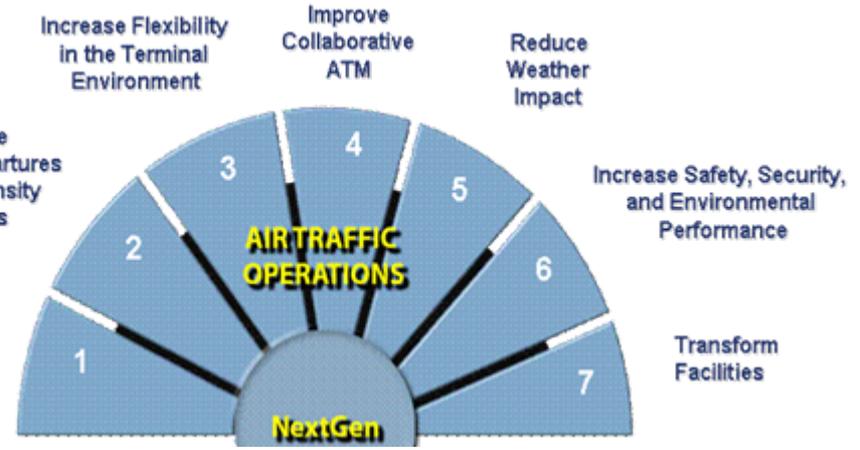
→  
SV-2



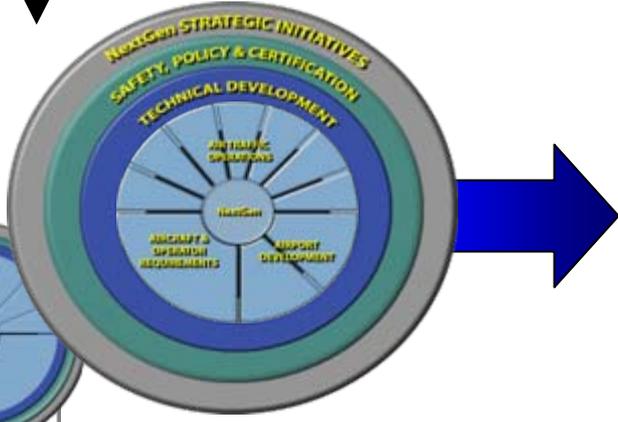
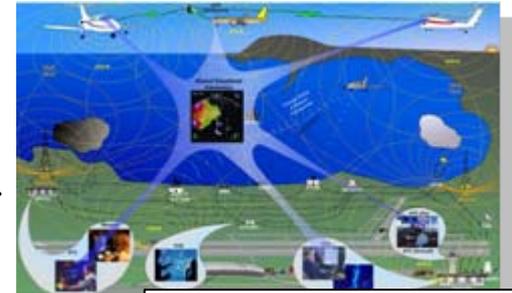
other EA views too...

# NextGen Key Capabilities

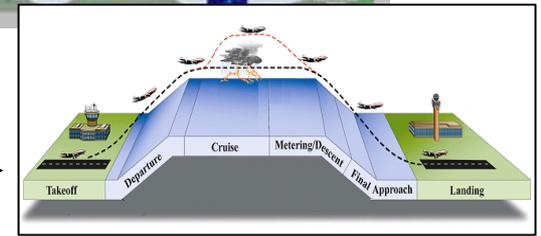
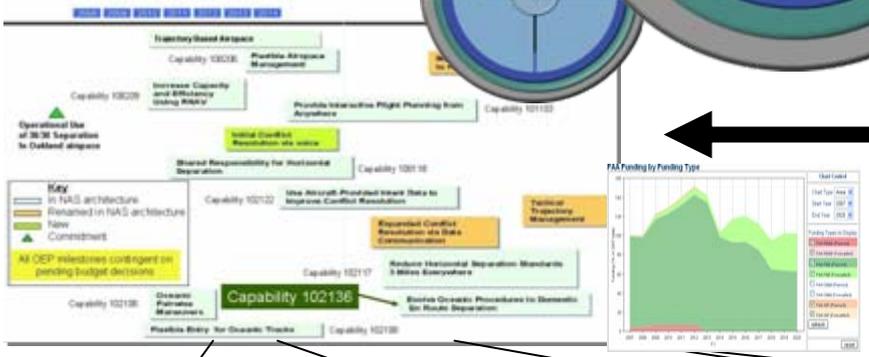
Seven (7) Solution Sets address and deliver *Capacity, Efficiency, Safety and Security* benefits for air transportation operations



## NASEA



## Roadmap



## Programs

En Route Automation Modernization (ERAM)	NextGen Collision Avoidance System	NextGen Traffic Flow Management	SWIM	Aeronautical Data Link
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# Services to Sub-capabilities to Programs/Projects

2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023 2024 2025 2026

## Solution Set Capabilities / OIs

Initiate Trajectory Based Operations

- Separation reduction - 50 longitudinal miles in Anchorage Oceanic airspace
- 50 nmi Lateral Separation in WATRS
- ADS-B in Gulf Of Mexico

OI [102118] Delegated Responsibility for Separation

OI [102108] Oceanic In-Trail Climb and Descent

Etc. Etc. Etc.

Tactical Trajectory Management

Reduce Horizontal Sep **Ops Benefits**

NextGen Oceanic Procedures

Separation Management

## Sub-Capabilities

Tactical Trajectory Management Capability

Reduced Oceanic Separation-3miles

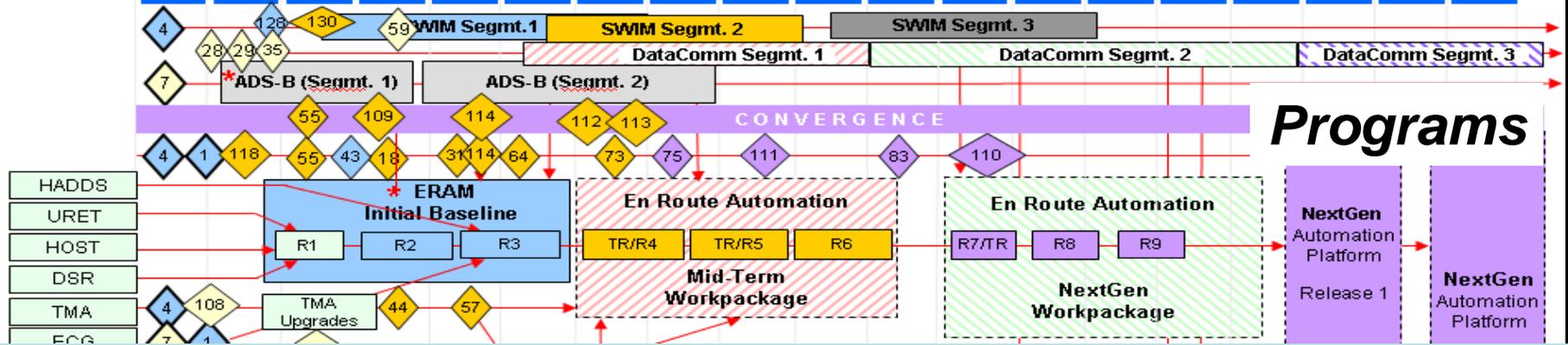
Etc. Etc. Etc.

**Functions**

## Infrastructure Roadmap

## Automation Roadmap (1 of 2)

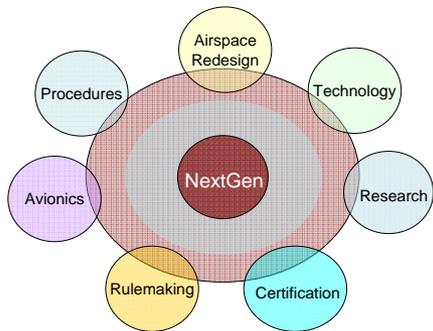
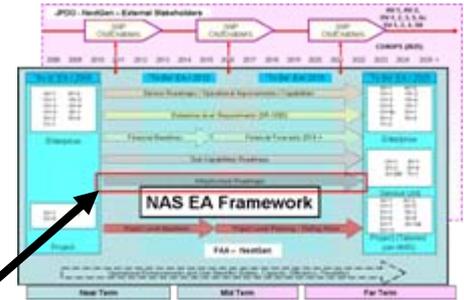
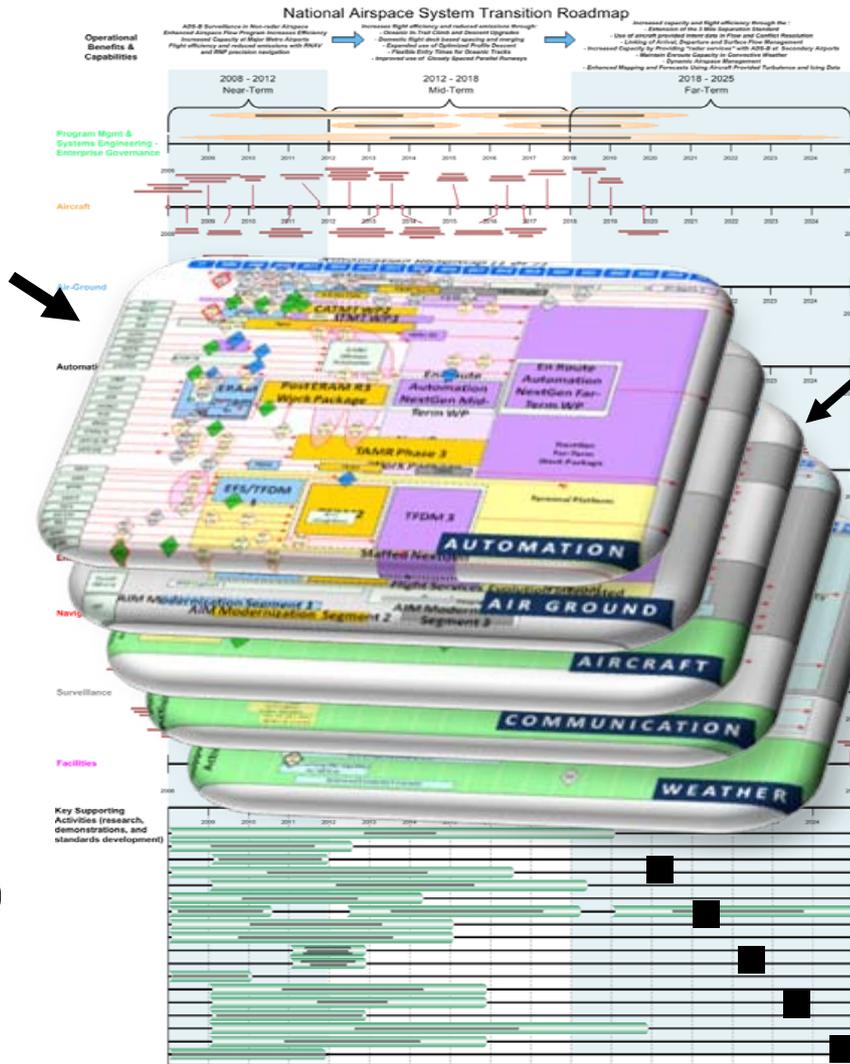
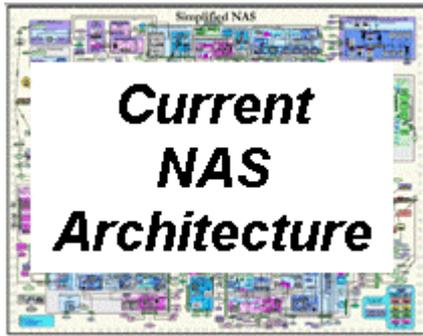
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023 2024 2025



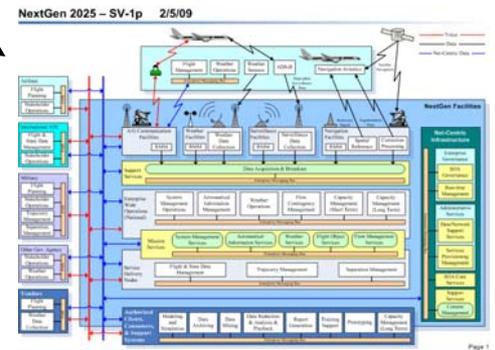
**Programs**

# NAS EA Roadmaps Capture the Evolution Strategy

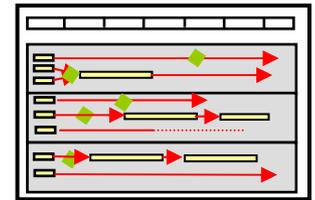
Current  
2009



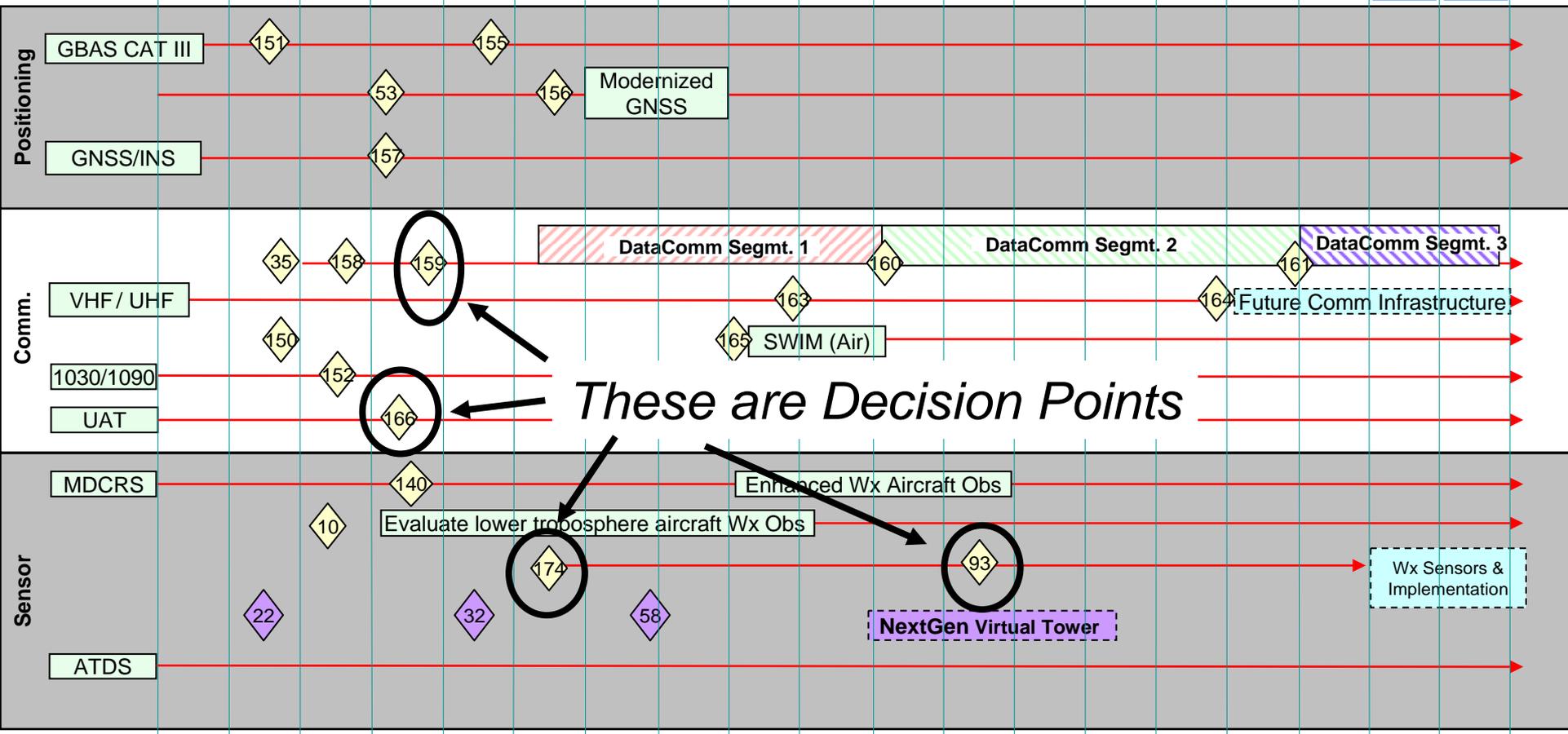
NextGen  
2025+



# Infrastructure Roadmaps



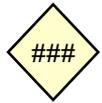
- **Infrastructure Roadmaps are...**
  - Used to define the FAA's *plan* for enterprise level system, sub-capabilities, and project evolution over time – updated annually
  - It provides the integrated decisions and synchronized investments needed to deliver NextGen and evolve the NAS (technology, policy, strategy, training, procedures, research, etc.)
- **Roadmaps for this year's update are:**
  - **Aircraft** (Steve VanTrees), **Automation** (Chuck Romano), **Air-to-Ground** (Ron Stroup), **Airspace & Procedures** (Brian Holguin), **Communications** (Brent Phillips), **Facilities** (Chuck Dudas), **Navigation** (Dave Olsen), **Surveillance** (Jim Baird), **Weather** (Cheryl Souders), **Enterprise Services** (Mike Hritz), **Human Systems Integration** (Glen Hewitt), **Security** (Ken Kepchar), **Safety** (new for 2009) (Jim Daum), **Airports** (new for 2009) (TBD)
  - Roadmaps capture *decision points (and major milestones)*, assumptions, and dependencies
  - Infrastructure Roadmaps mapped to sub-capabilities and to the NextGen Solution Set OIs for this year's update
  - Final products capture contributions from ATO service units, AVS, etc.



R,E&D Activities with Technology Readiness Levels Demonstrations and Prototypes  
 International Efforts: e.g., ICAO, SESAR Linkages  
 Other Risk Reduction Activities



# New Decision Point Attribute/Coding



Decision Point (DP)/Commit



Planning DP



Higher Priority Decision Point



Completed

Border colored red if also a critical DP



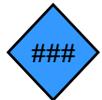
AMS Decision Points (IARD, IID, FID, BCD, ISD)



Policy



Strategy



Executive Level



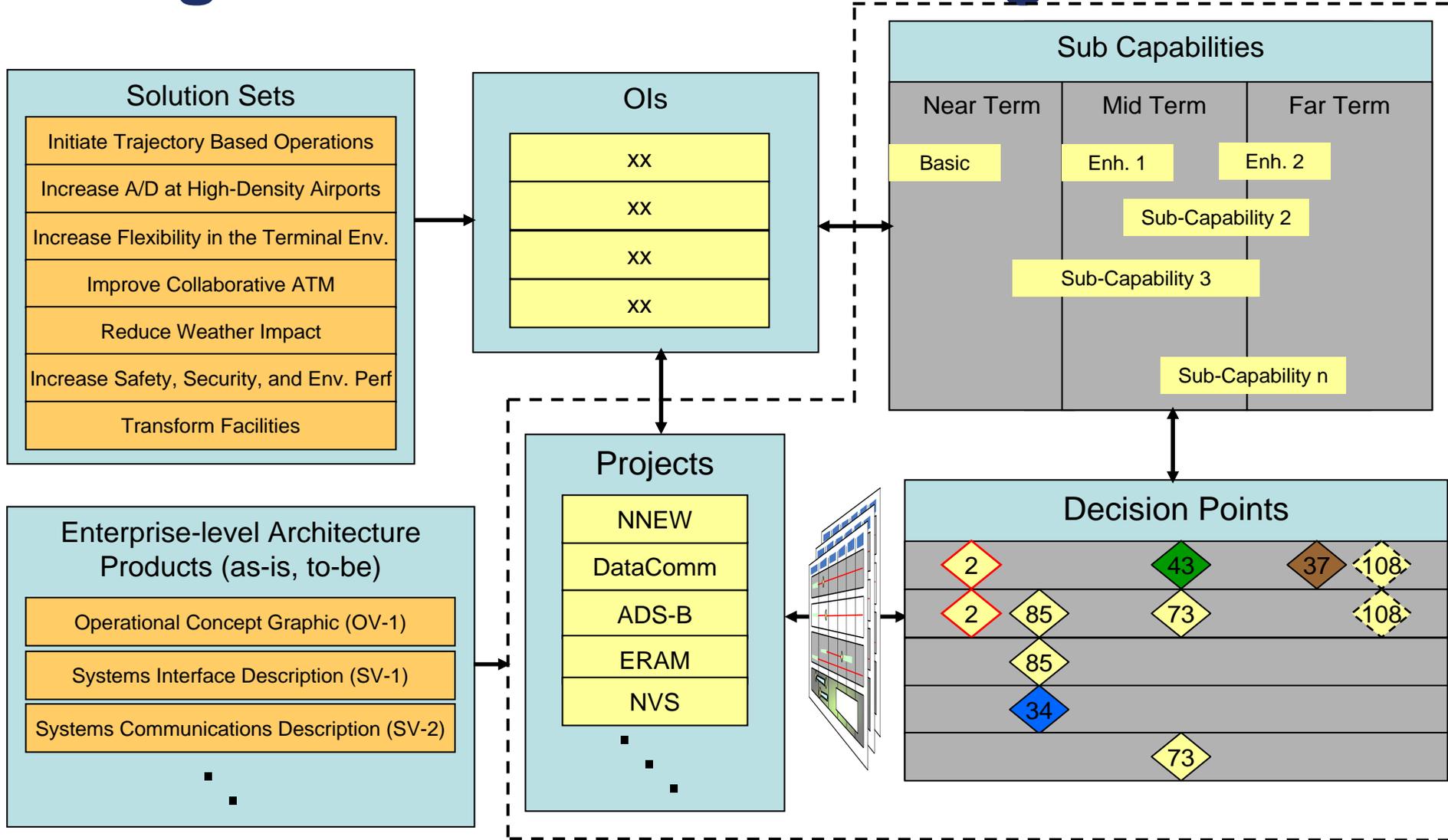
DP Owned by Another Roadmap

# 2008 Roadmap Enhancements

- **New roadmaps – Air-to-Ground, Airspace & Procedures, Security, HSI, and Enterprise Services**
- **Broader participation - Human factors, Safety, RE&D, etc.**
- **Decision point reporting – revised framework and coding**
- **Integration of R & D activities – Roadmap Injection/Decision Pts (including TRL identification)**
- **Alignment of EA and Infrastructure Roadmaps with JPDO IWP OIs, NxtGenImp Plan OIs & capabilities, and the service roadmaps – graphics and spreadsheets**
- **Addition of remaining sustainment efforts and legacy programs**



# Integration Framework - Alignment



# Sample OI/Capability to Sub-capability to Infrastructure Roadmaps Mapping

2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023 2024 2025 2026

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**Ops Benefits**

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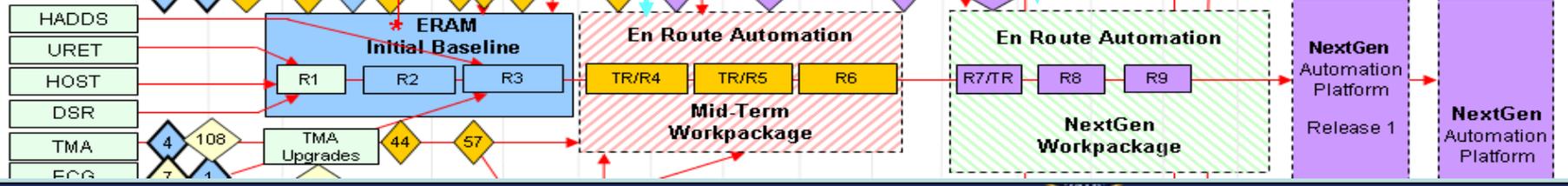
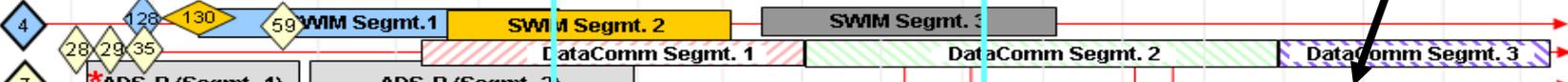
Etc. Etc. Etc.

**Functions**

## Infrastructure Roadmap

## Automation Roadmap (1 of 2)

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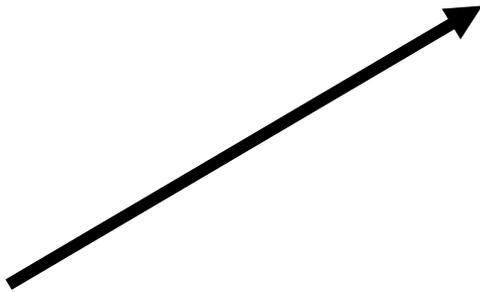
**Programs**

# '09 Activities / Focus Areas

- **Improve Integration and Alignment of Supporting Activities**
- **Align EA with financial management systems**
- **Align EA with benefits/models**
- **Add DPs for CRD Readiness**
- **Align activities with environmental benefits**
- **Look for opportunities for convergence**
- **Align with Portfolio Management Definition Activities**
- **JPDO Workgroup Activities – Alignment**

# NAS EA Portal / Training

**Fall 2009  
Launch Date**



Federal Aviation Administration  
NAS Enterprise Architecture Portal

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Feedback? [click here]

NASEA Portal Top 5  
Automation Information Roadmap  
To-be EA 2025 Enterprise Level  
To-be EA 2012 Mission Threads  
Financial Forecast 2014+  
NASEA EAB Briefing Jan 2009

Recent Changes  
DP XXXX  
Mach XXXX  
OI XXXX  
Project XXXX

NASEA Data And Statistics  
Sample Data  
Block 1 Block 2 Block 3 Block 4 Block 5

Quick Links  
Certification Summary  
Decision Point Browser  
Executive Views  
Comment Tool  
Readers: [icon] [icon] [icon]

NASEA News & Events  
New 1 - Lorem ipsum dolor sit amet, consectetur adipiscing elit.  
Oct 22 - Suspendisse nisi ante, aliquam nec, aliquam in, semper at, odio.  
Oct 19 - Nullam facilisis, orci vitae faucibus mollis, ipsum ipsum aliquet felis, sed porttitor nisi tortor at ipsum.

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Welcome to the FAA NAS Architecture 6

This site is a tool for displaying the National Airspace System (NAS) Architecture 6. NAS Architecture 6 was released August 2009 as an update to NAS Architecture Version 5, released October 2003. Incorporating the FAA's strategic plans and programs, architecture 6 represents a multi-year roadmap to measure progress in modernizing the NAS.

Site Point of Contact  
For further information or questions, please use the COMMENT button.

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Page	123	145	167	189	211	233	255	1313

The NAS Architecture website will be unavailable during the Road maintenance window:  
From 9:00 pm - 6:00 pm EST on the 1st Friday following the 1st Sunday and the 1st Friday of each month.

<http://nas-architecture.faa.gov>

## EA Web Course

[http://elmsstaging.dot.gov/elms/external\\_content/ato/64000003-NAS-EA/launcher.html](http://elmsstaging.dot.gov/elms/external_content/ato/64000003-NAS-EA/launcher.html)

