# Operational Evolution Partnership

*An Introduction to FAA's Integration & Implementation Plan for NextGen*

Briefing to National Airspace System Performance Workshop
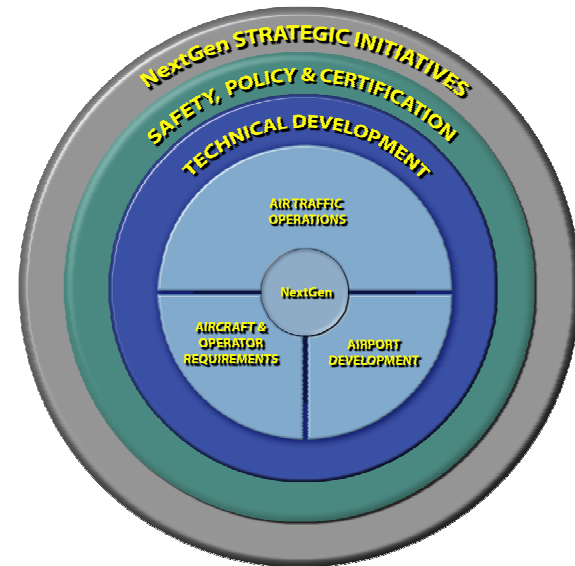
September 2007

**Federal Aviation Administration**

# OEP is FAA's path to NextGen

"This Operational Evolution Partnership will be the mechanism by which we inform our owners, customers, and aviation community of our plans and progress towards the NextGen vision…"
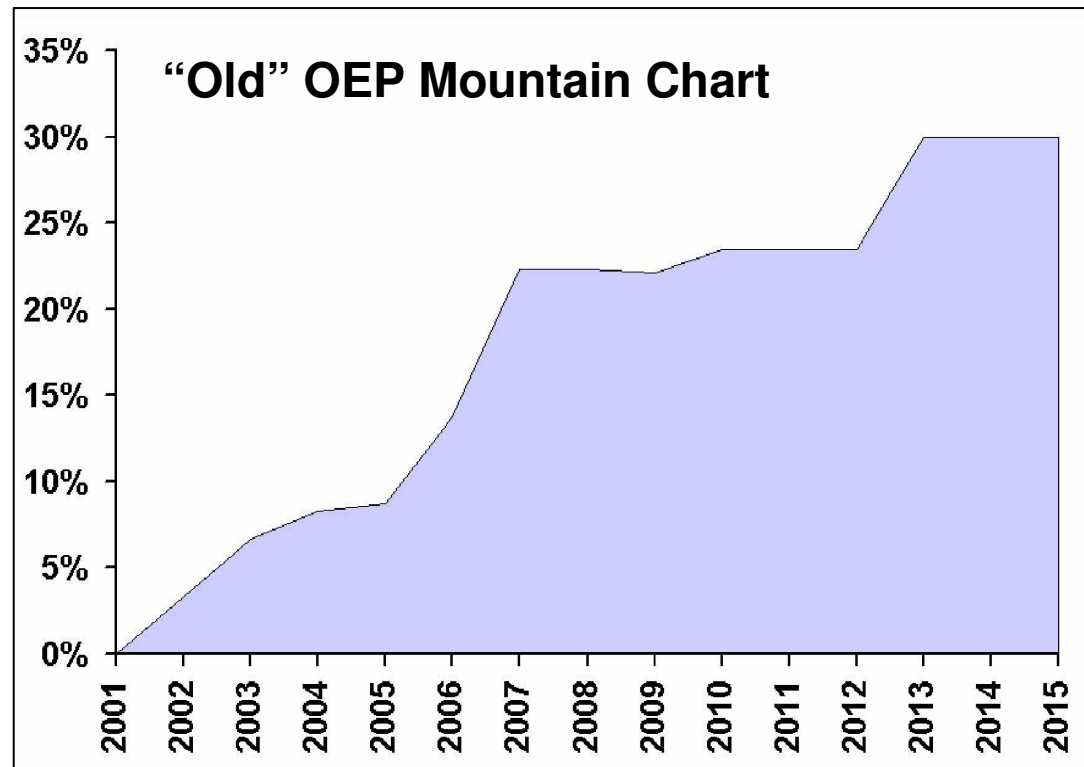
*-- Marion C. Blakey, FAA Administrator, before the Senate aviation subcommittee, May 2006*

# Why OEP?

**The Right People, Right Process**

- **Cross-Agency Participation**
- **Cross-Community Support**
- **Proven Results**



"Old" OEP Mountain Chart

**Goal Achieved by 2013:**
**30% increase in effective capacity**

# Agenda

- **What is OEP?**

- **Who has authority over OEP?**

- **How does OEP work?**

- **Where must OEP go from here?**

# What is OEP Version 1?

- **Defines framework for FAA's NextGen implementation plan**
  - Scope is broader than capacity
  - Reflects NextGen vision
- **Demonstrates how FAA's integration & implementation plan will be executed**
  - To ensure development processes are not just parallel, but complementary
- **Aligns research & development with NextGen objectives**
- **Provides high-level "big picture" content**
- **Initiates industry collaboration process**
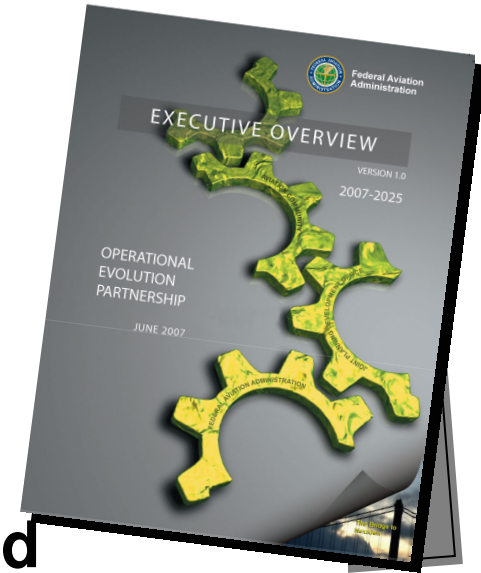
**OEP online: www.faa.gov/programs/oep**

# Operational Evolution **Partnership**



## Plus….FAA Cross-Agency Integration

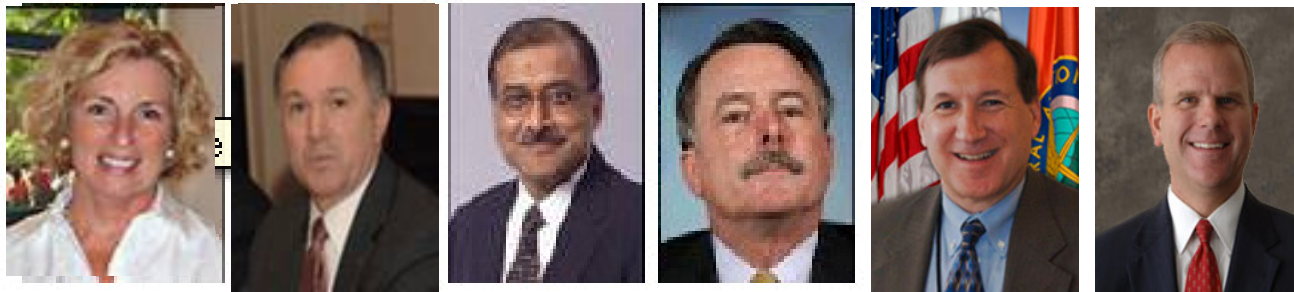# Who has authority over OEP?

## OEP Associates Team

**Advised by the OEP Review Board**

**Guided by Ops Planning VP Vicki Cox**

# How will FAA achieve JPDO's NextGen Vision?

- Entry to OEP via OEP Review Board process

- OEP will show commitment and accountability

- OEP will track milestones

# Why do we need the new OEP and new processes

- **OEP**
  - Explains how FAA will execute NextGen
  - Represents commitment to implementation

- **OEP Process**
  - Provides an effective mechanism for managing JPDO recommendations
  - Allows FAA to manage budgets dedicated to NextGen
  - Forces FAA R&D to be relevant to NAS/NextGen requirements
  - Provides for cross Agency & cross ATO influence over future direction of the NAS
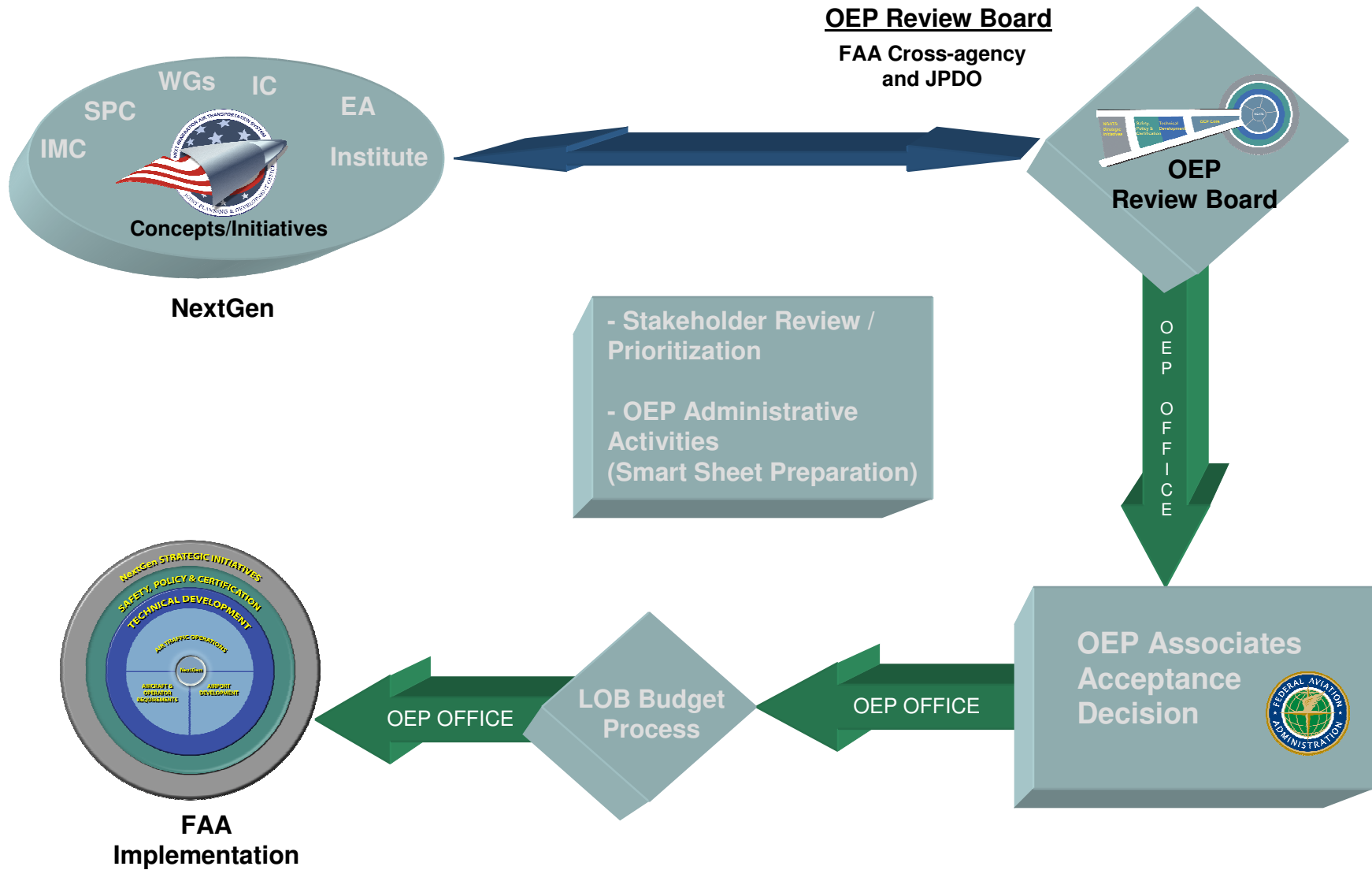  - Allows for early buy-in from external stakeholders

# Review Board Membership

## Co-Chairs:  ATO VP Ops Planning & Director of JPDO

| | | |
|---|---|---|
| **AVS**<br>John McGraw | **ARP**<br>Ben DeLeon | **AEE**<br>Lourdes Maurice |
| **AVS (Safety)**<br>Wes Timmons | **ARC**<br>Angela Freeman | **AST**<br>Sheila Helton-Ingram |
| **ABA**<br>Rob Nassif | **APO**<br>Nan Shellabarger | **JPDO**<br>Kris Burnham |
| **JPDO Chief Architect**<br>Jay Merkle | **FAA Chief Architect**<br>Diana Liang (a) | **ARD/CIO**<br>Mark Powell |
| **ATO En Route**<br>Luis Ramirez | **ATO Terminal Services**<br>Raul Trevino | **ATO Sys Operations**<br>Rich Jehlen |
| **ATO Finance**<br>Maria DiPasquantonio | **ATO Technical Operations**<br>Jim Eck | **ATO Operations Planning**<br>Jim Williams |
| **ATO Safety**<br>Huan Nguyen | **Performance Measurement**<br>Dan Murphy | **Human Factors**<br>Terry Allard |
| **OEP**<br>Gisele Mohler | **MITRE**<br>John Pyburn | |

# OEP Process Flow



**OEP Review Board**

**FAA Cross-agency and JPDO**

WGs IC
SPC EA
IMC Institute

**Concepts/Initiatives**

**NextGen**

**OEP Review Board**

OEP OFFICE

- Stakeholder Review / Prioritization

- OEP Administrative Activities (Smart Sheet Preparation)

**OEP Associates Acceptance Decision**

**LOB Budget Process**

OEP OFFICE

OEP OFFICE

**FAA Implementation**

# Roles and Responsibilities for the OEP Review Board

- Consider JPDO CONOPS, Roadmaps, Enterprise Architecture, Budget Guidance, etc.

- Focus on initiatives for implementation in the NAS

- Prioritize initiatives

- Make recommendations to OEP Associates

- Provide oversight /status/guidance on ongoing initiatives

- Report findings with recommendations to OEP Associates Team
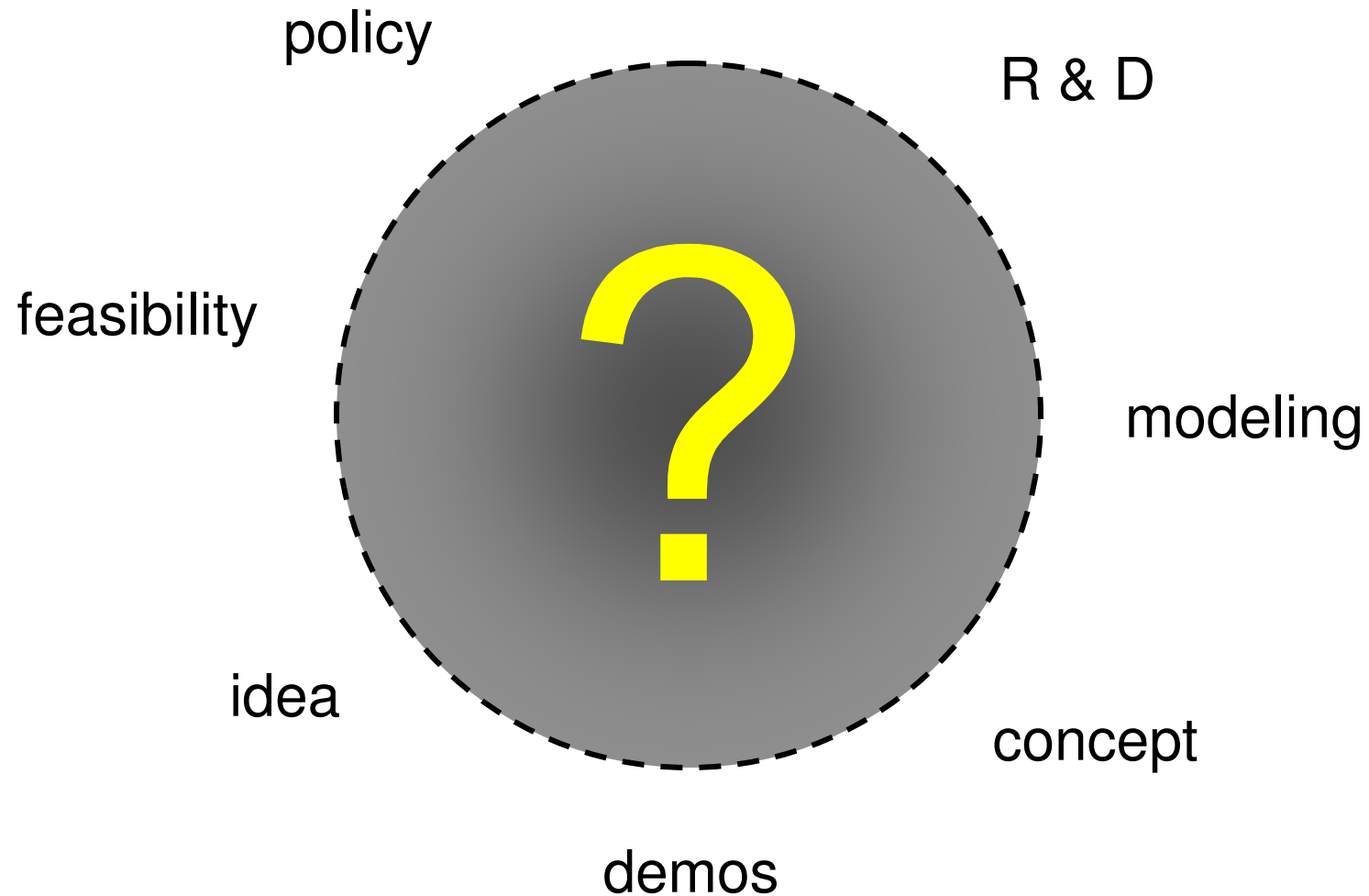
# The Path to NextGen:

# OEP
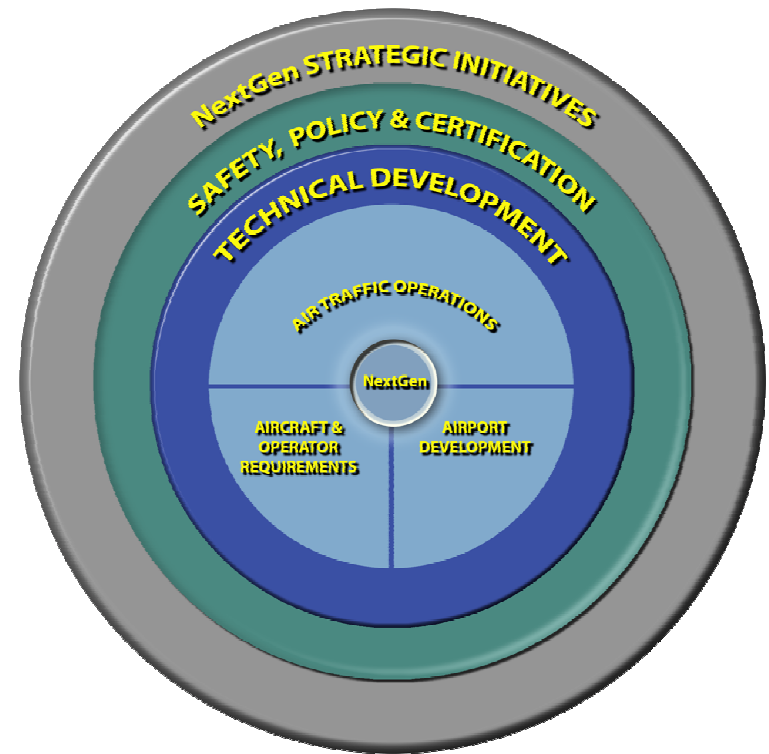


- Core contains FAA Commitments

- Transition Rings
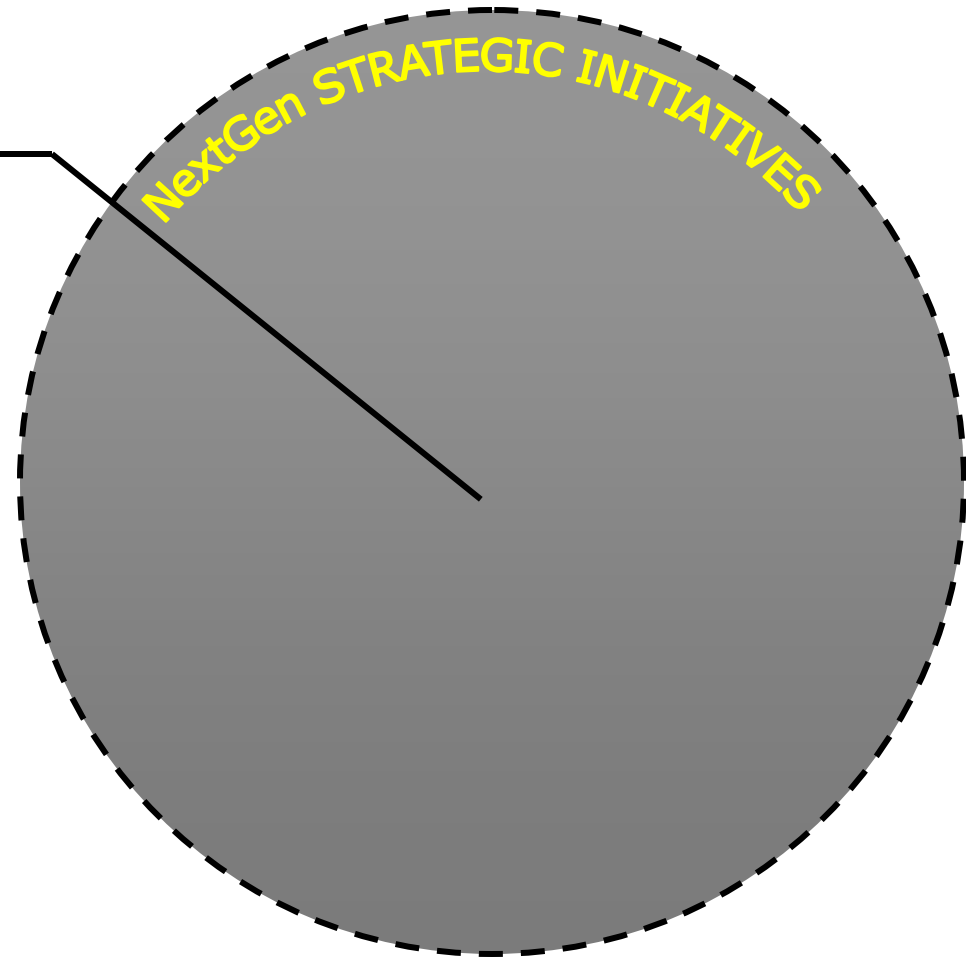  - Related activities that are less mature – but funded
  - R&D programs in outer ring

# Before NextGen

policy

R & D

feasibility

?

modeling

idea

concept

demos

# The Path to NextGen

## NextGen Strategic Initiatives

Advanced NAS Concepts

System Performance Requirements

Concept Demonstrations

Initial Benefits and Cost Estimates

Research



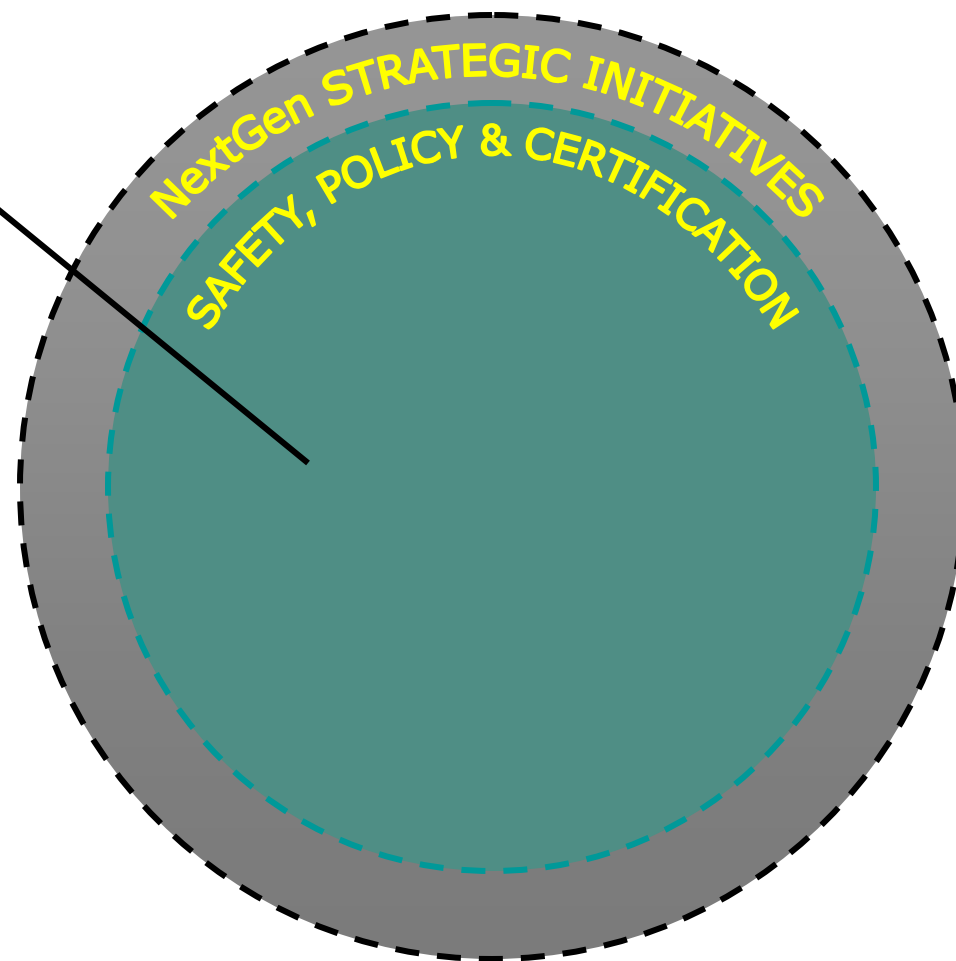NextGen STRATEGIC INITIATIVES

# The Path to NextGen

**Safety, Policy & Certification**

Safety Analysis

Operating Policy

Performance Standards

Certification Requirements

Operating Requirements



NextGen STRATEGIC INITIATIVES

SAFETY, POLICY & CERTIFICATION
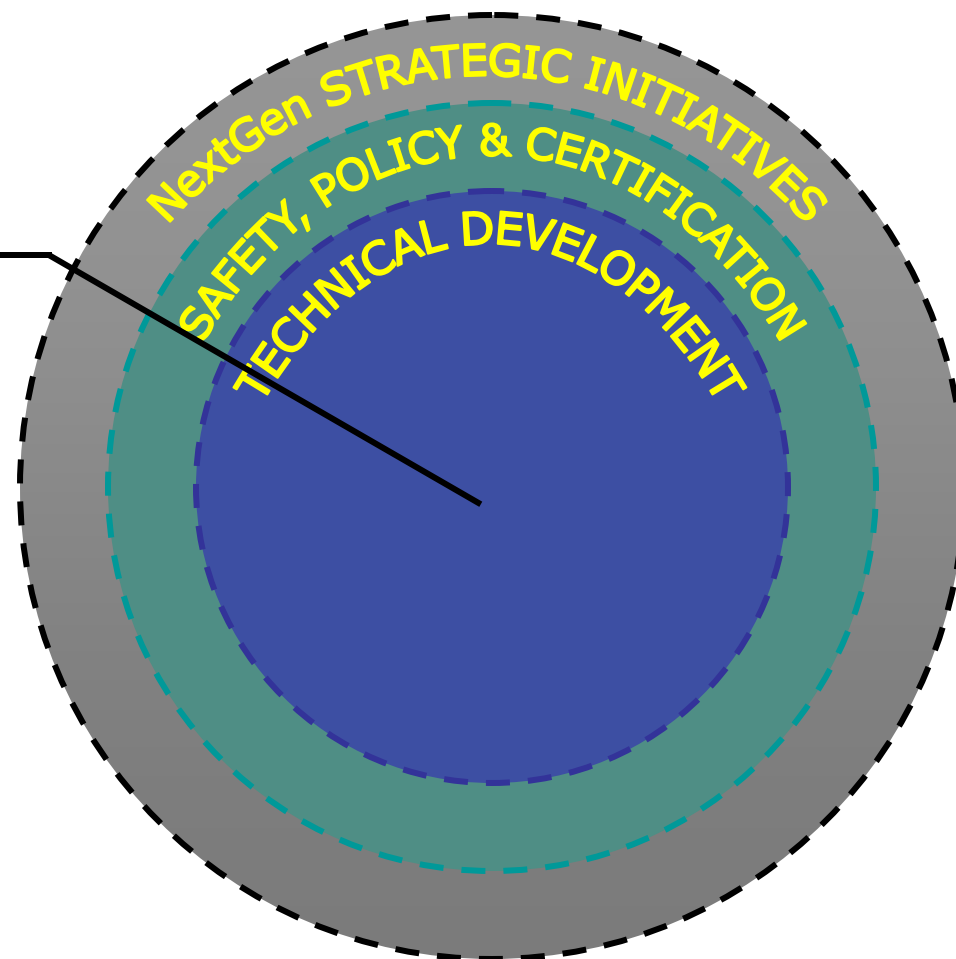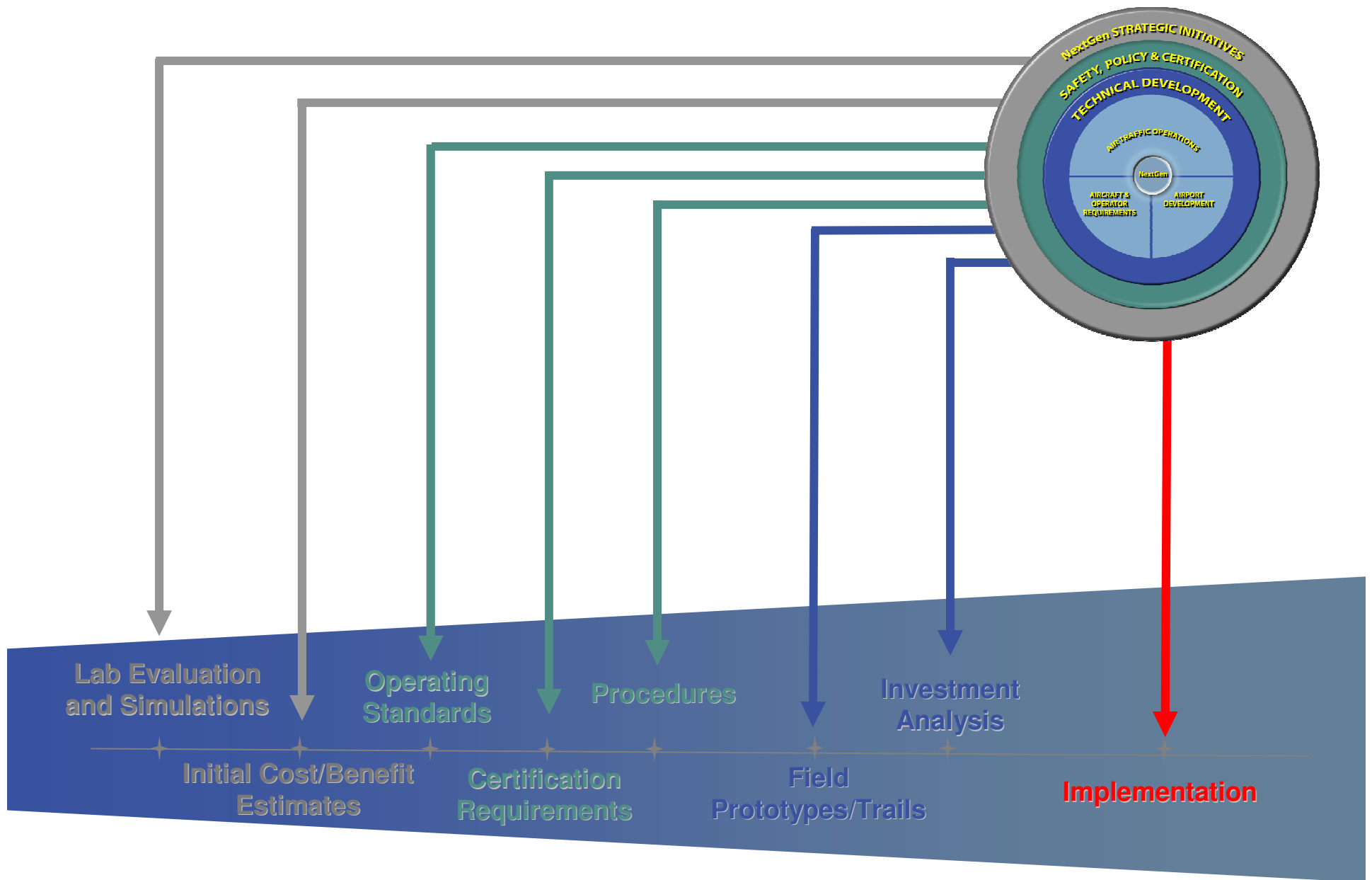
# The Path to NextGen

## Technical Development

Alternatives Analysis

Field Prototypes

Operational Field Trials

Investment Analysis



NextGen STRATEGIC INITIATIVES

SAFETY, POLICY & CERTIFICATION

TECHNICAL DEVELOPMENT

Lab Evaluation and Simulations

Operating Standards

Procedures

Investment Analysis

Initial Cost/Benefit Estimates

Certification Requirements

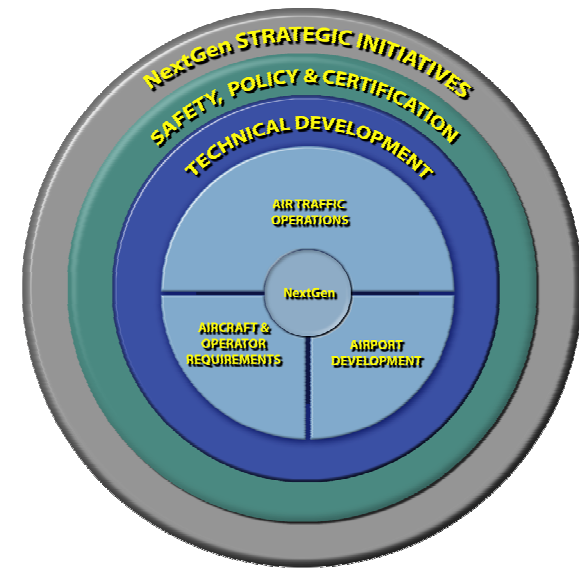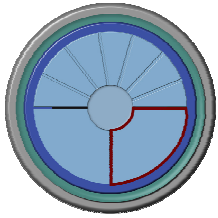Field Prototypes/Trails

Implementation

# Defining the 3 OEP Domains

Airport Development
- – New concrete

Air Traffic Operations

- – Transformational capabilities
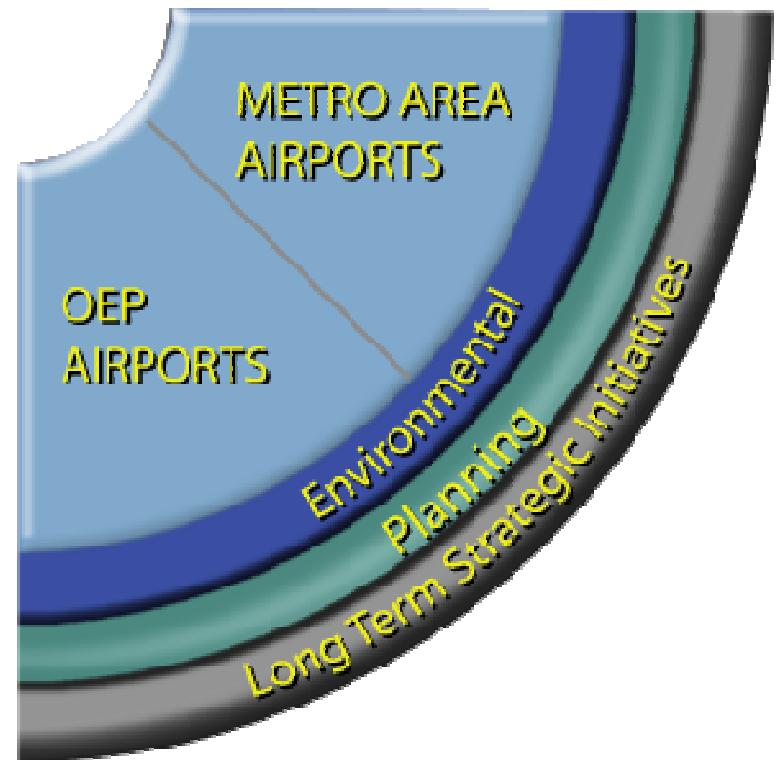
Aircraft & Operator Requirements

- – Avionics

# 1. Airport Development Domain

**Focus:** Airport infrastructure for greater capacity and delay reduction

- **OEP 35 Airports, with a view of longer range planning**

- **Metropolitan Areas**

  - 15 metropolitan areas

  - 80+ non-OEP airports



METRO AREA AIRPORTS

OEP AIRPORTS

Environmental

Planning

Long Term Strategic Initiatives

# Airport Development Solution Set: OEP 35 Airports
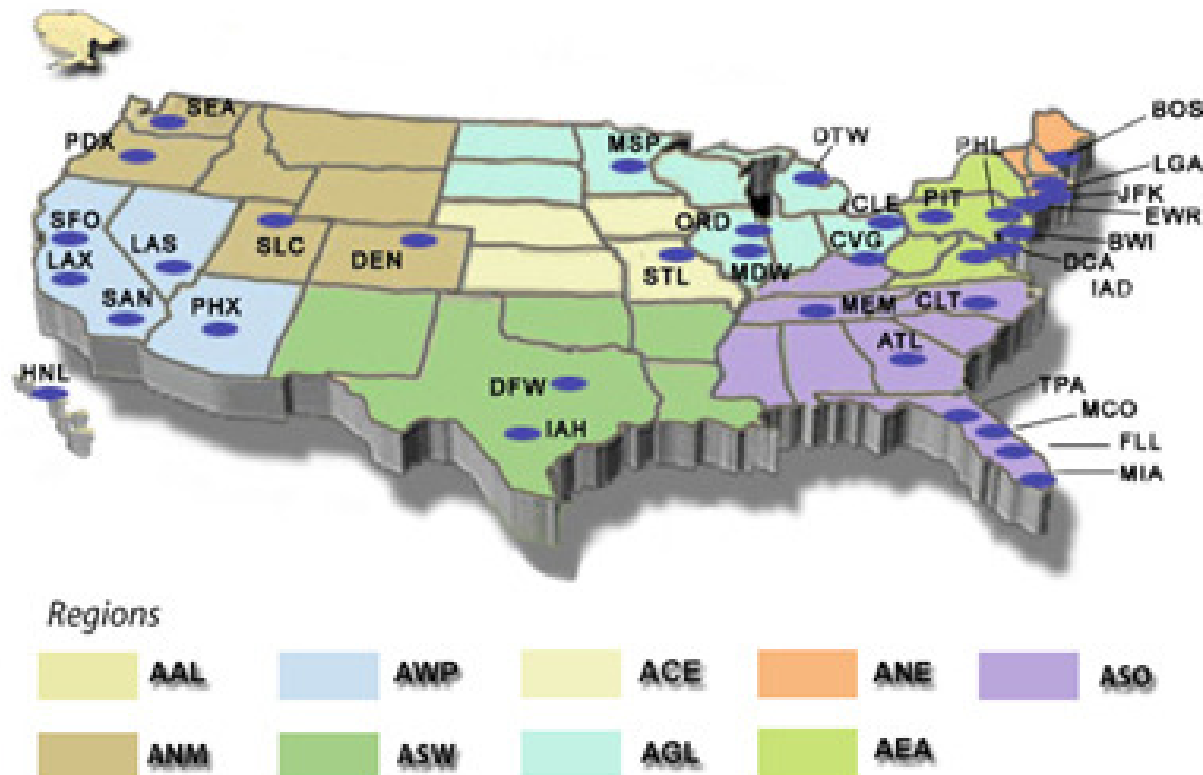


*Offers an expanded view into planning for new airport infrastructure at the nation's busiest airports*

# Airport Development Solution Set: OEP Metro Areas



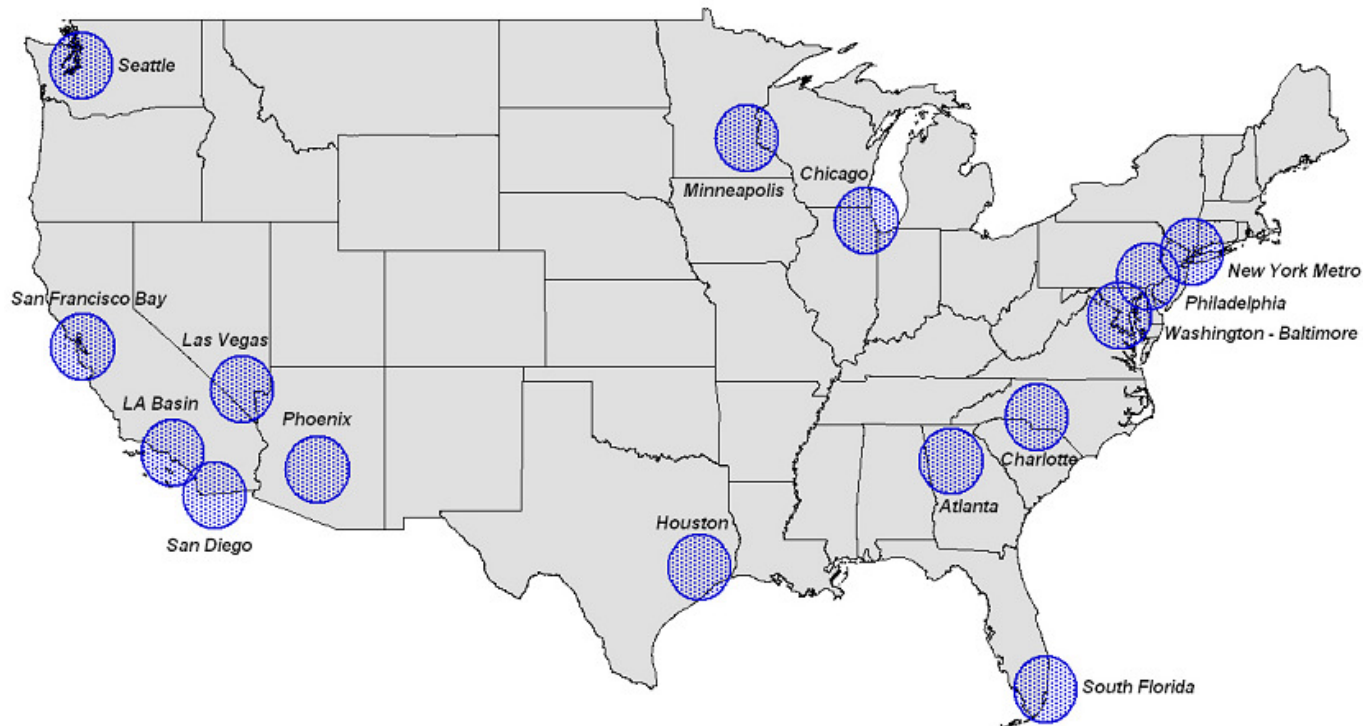*Promotes regional planning.*

*Identifies supporting airports.*

*Monitors infrastructure investments.*
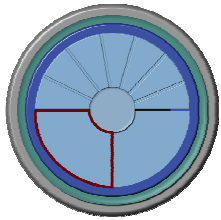
# 2. Aircraft & Operator Requirements



AIRCRAFT & OPERATOR REQUIREMENTS (AVS)

TECHNICAL DEVELOPMENT
SAFETY, POLICY & CERTIFICATION
NGATS STRATEGIC INITIATIVES

NextGen Aircraft/Avionics Functions

Displays

Pilot

Controls

Aircraft-Based Independent Sensors

Trajectory Management

Positioning
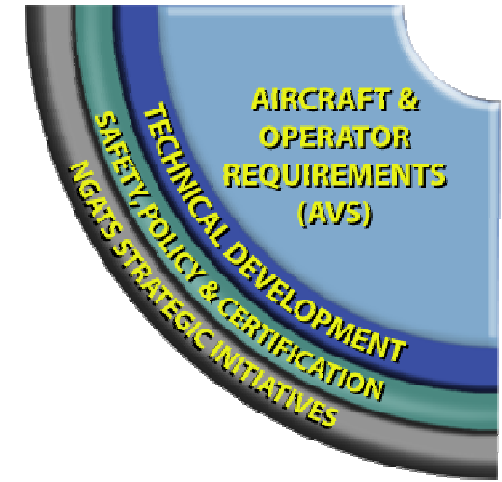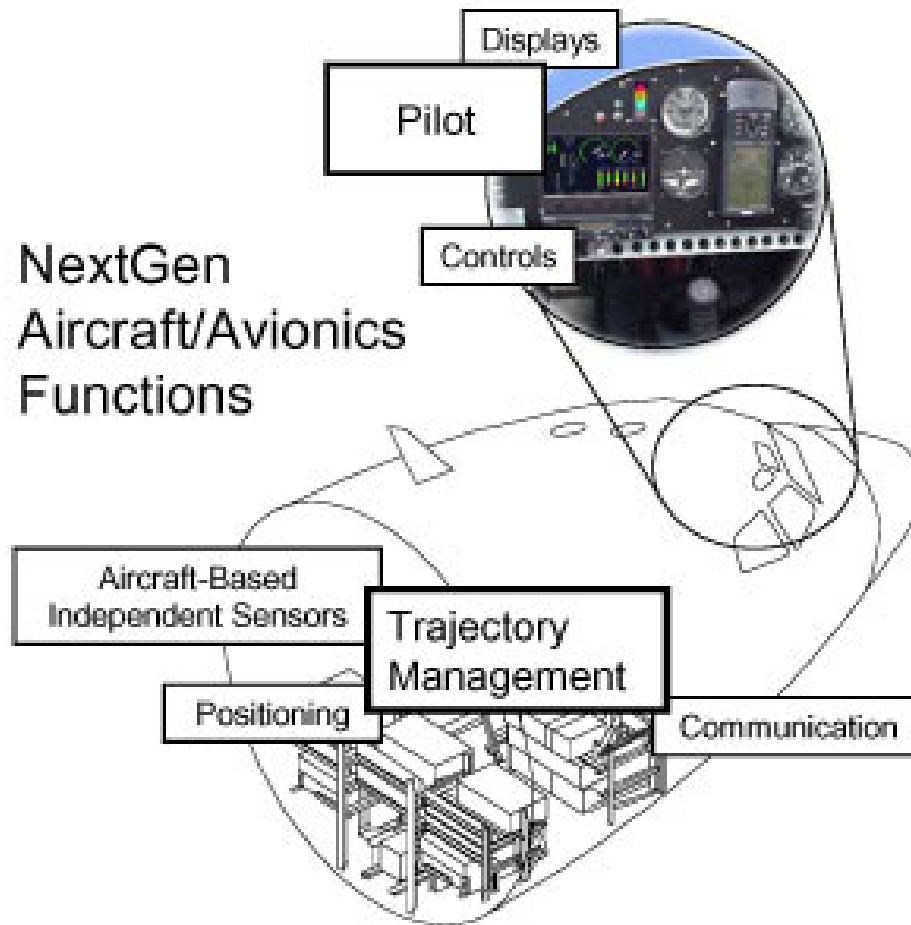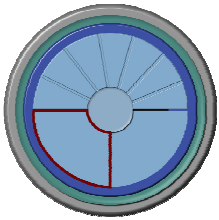
Communication

# Aircraft & Operator Requirements

- Aligns ground and air infrastructure planning for avionics

- Aims to ensure that avionics will ready at the same time we implement new capabilities

- Helps the aviation community make informed equipage decisions
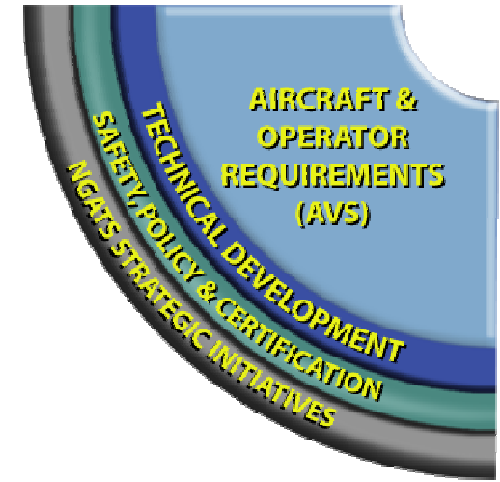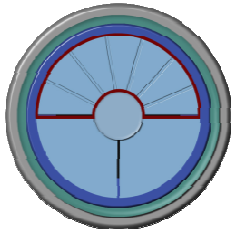
# 3. Air Traffic Operations Domain

## Seven (7) "Solution Sets" targeted to address
### *Capacity, Efficiency, Safety, Security*
## of air transportation operations

Increase Flexibility in the Terminal Environment

Improve Collaborative Air Traffic Management

Reduce Weather Impact

Increase Arrivals/Departures at High Density Airports

Increase Safety, Security, and Environmental Performance

Initiate Trajectory-Based Operations

Transform Facilities

**AIR TRAFFIC OPERATIONS**

1 2 3 4 5 6 7

**NextGen**

**Initiate Trajectory Based Operations**

# OEP Solution Set is a portfolio of capabilities

*For example:*



**TRAJECTORY-BASED OPERATIONS SOLUTION SET**
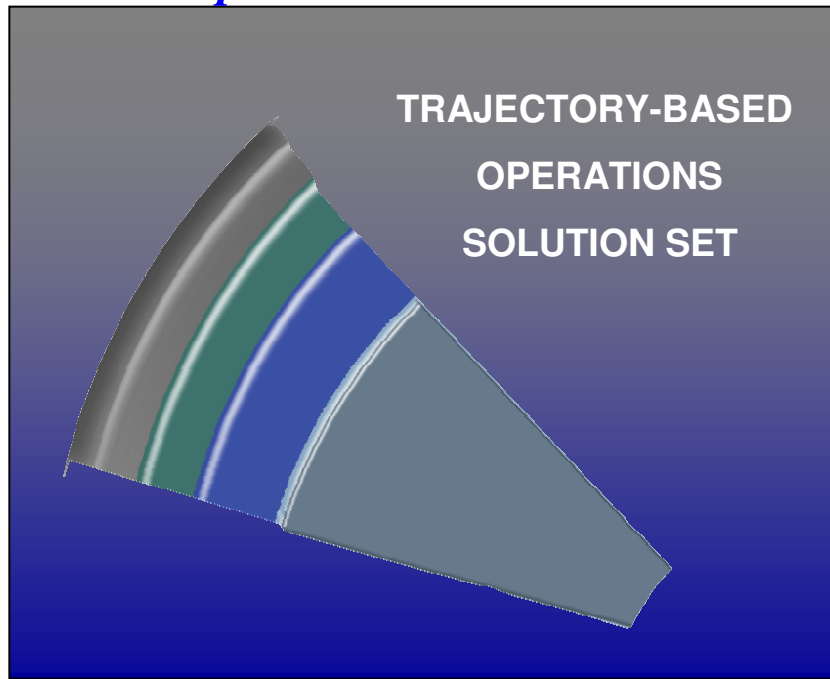
- Automated conflict detection
- Clearances by data vs. by voice
- Sectors managed automatically
- Variable separation based on wake
- Real-time assessment of airspace flow

# Integration of Activities

Capability Implementation Plans
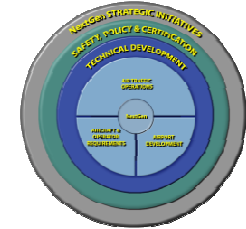


Integrates activities from multiple LOBs/ Service Units.
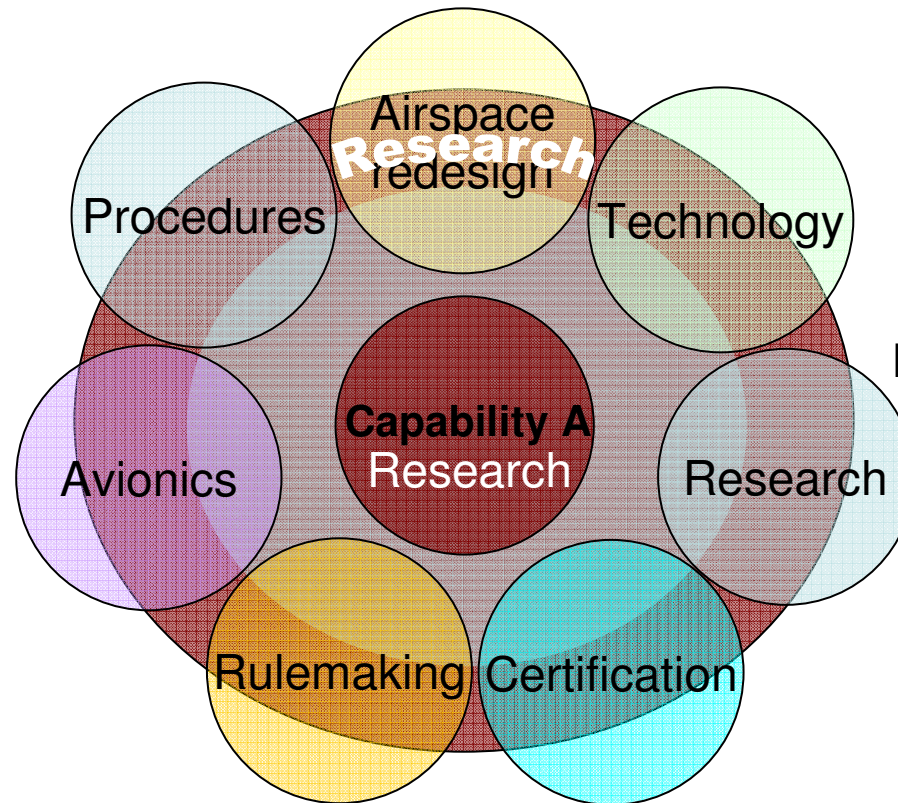
Identifies which activities are needed & when for a given capability.

Solution Set manager will coordinate cross-agency integration for each solution set.
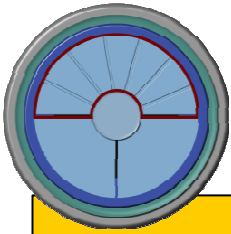
# What information will OEP contain?

## Solution Set Smart Sheet

• Describes the solution set and its benefits

• Describes the capabilities that build the solution set, including the implementation plans for each

• Implementation plans show which segment of a program impacts a capability.
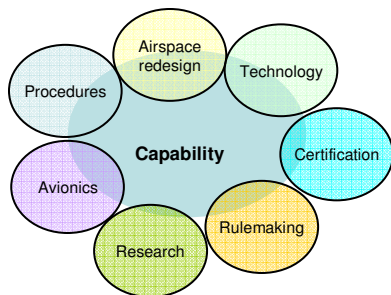
**Implementation Plan**

• Datacom Segment X

## Reference Sheet

• Briefly describes major NextGen programs, like datacom and ADS-B

• Includes program's timeline with all of its segments, as a cross-reference

**Datacom**

(NOTIONAL)

# OEP In Context



NextGen
ConOps

OEP

NAS Enterprise
Architecture

ATO Service Unit
Business Plans

Program Office Implementation
Plans, Schedules, Funding

Fielded NAS systems

*Increased level of details*

*Planning &
Integration
occurs at
all levels*
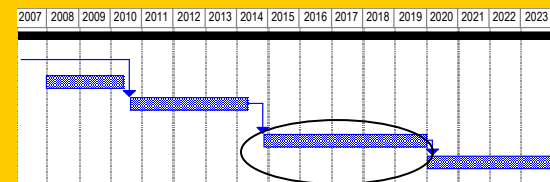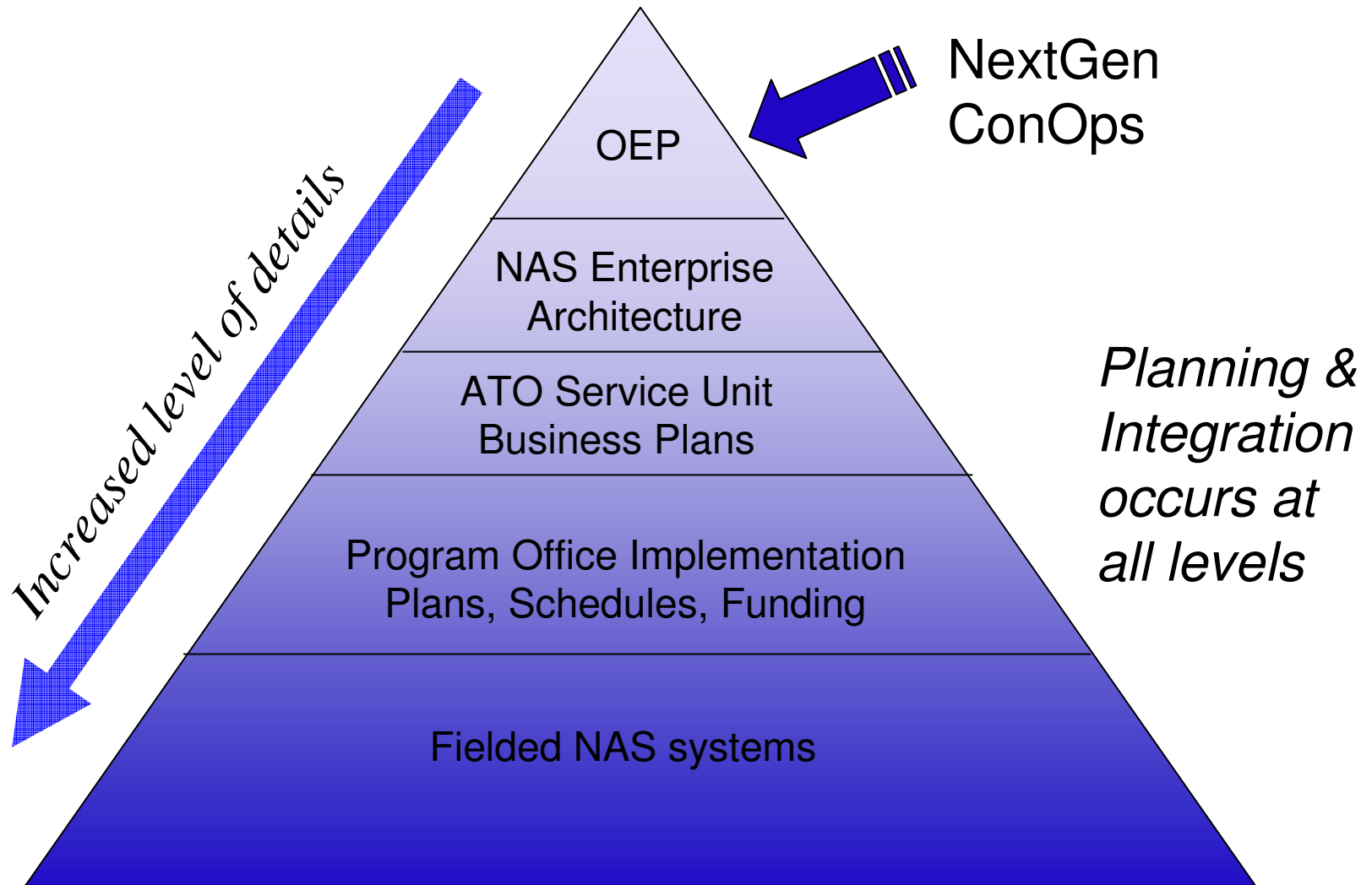
# FAA is Using the new OEP

- **OEP framework is focusing agency strategic planning activities**
  - Guiding budget formulation
  - Prioritizing resources
  - Focusing research & development
  - Integrating program planning
  - Developing long-term performance analyses models
  - Informing international interoperability discussions
- **Delivering Mid-Term Capabilities**

# OEP Focus is on the Mid-term (2012-2018)

- Without improvements to the Air Traffic System, delays are projected to increase 62% by 2014

- 27% increases in domestic traffic projected for 2016

- Studies have shown that controllers cannot handle 25% increases in traffic in the busiest sectors using tools available today

Bottom line:
Failure to accommodate demand will have severe economic impact inside and outside the aviation industry

# FAA will use OEP to Deliver Mid-Term Capabilities

**2012-2018**

**Increase Arrivals/Departures at High Density Airports**



| FY | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | | 2025 |

Atlanta PRM Trips

ATL 5th Runway

TMA Deployment Waterfall (11 sites)

Implement En Route Time Based Metering Procedures

**Reduce Horizontal Separation Standards - 3 Miles**

**Integrated Arr/Dep Management**

**Delegated Responsibility for Horizontal Separation**

Independent Operations to CSPR

Wake Vortex Incorporated into Flow

**Time Based Metering Using RNAV/RNP route assignments**

Optimize Runway Assignments

Use Data Messaging To Provide Flow and Taxi Assignments

...nce Traffic Management ...formance Monitoring

Use Air... Intent Data to Improve Flow ...ct Resolution

Time ⟶

**OEP Delivers NextGen Capabilities in an Evolutionary Manner**

**Mid-Term Capabilities Are Steps on the Way to NextGen**

## OEP MID-TERM CAPABILITY ROADMAP

OPERATIONAL EVOLUTION PARTNERSHIP

### CAPABILITIES

- Support variable separation of aircraft
- Conflict resolution advisories & conformance monitoring
- Time-based metering to improve flow in constrained airspace
- Integration of en route and terminal arrival/departure airspace & integrating RNAV/RNP route selection
- Arrival/departure flow planning
- Integration of Wx information into air traffic decision support tools
- Improved access to Weather information
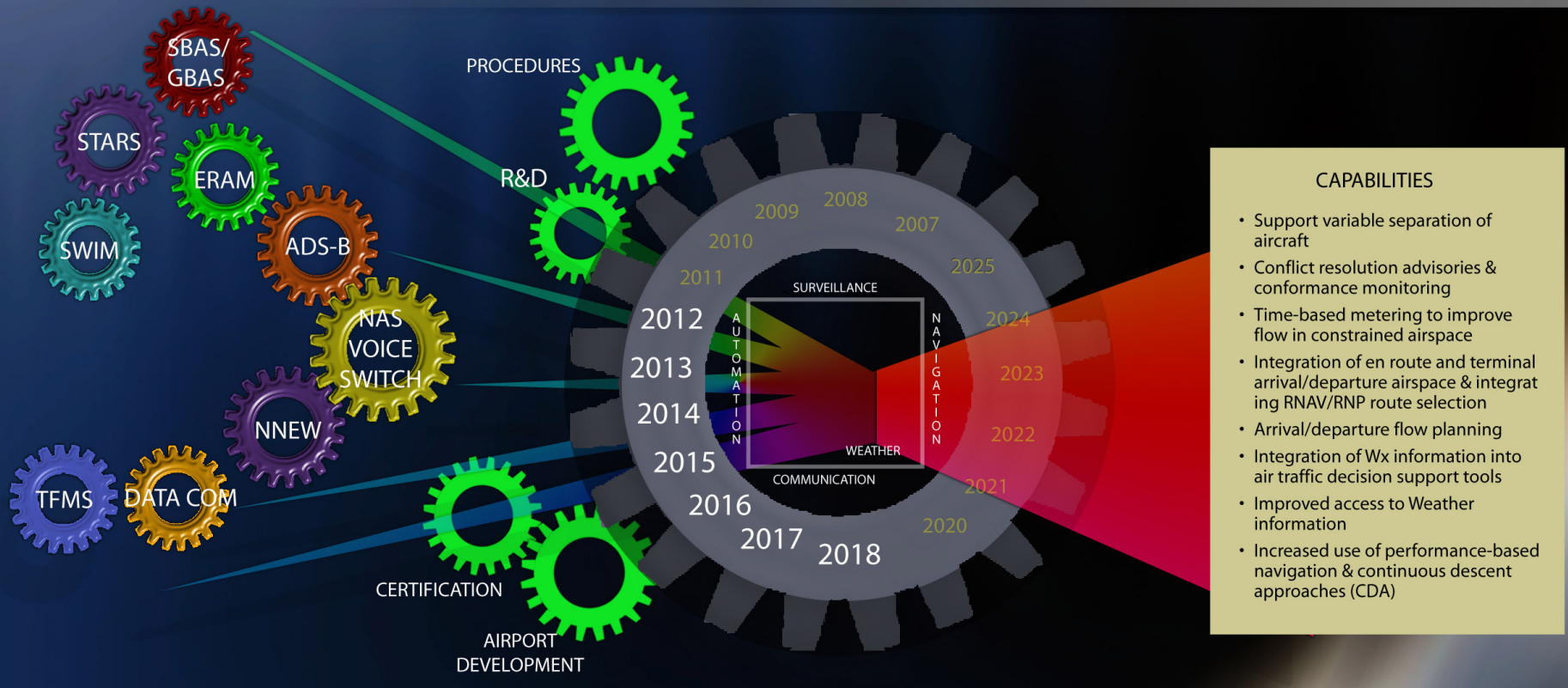- Increased use of performance-based navigation & continuous descent approaches (CDA)

- FAA is developing several key programs that provide the dynamic infrastructure that will underpin the NextGen system.

- When combined with today's research and development projects and new air traffic control procedures, these programs will allow FAA to implement NextGen's initial and end state capabilities.

- These capabilities will be described in the OEP Air Traffic Operations domain, which is divided into seven solution sets. These capabilities will be further broken down into a series of activities, the progress of which can be tracked to ensure the FAA remains on target for implementation.

- Initial internationally harmonized avionics will be used in the mid-term where they are available. New airport development will also increase capacity significantly in this timeframe.

# Ground Infrastructure Schedule

| CY | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | NEAR TERM | | | | MID-TERM | | | | | | | FAR TERM | | | | | | |

**AUTOMATION**

ERAM INITIAL BASELINE

ERAM & TMA INTEGRATION MID-TERM

ERAM NEXTGEN WORK PACKAGES

STARS CARTS

SWIM & ADS-B INTEGRATION INTO TAMR

COMMON AUTOMATION PLATFORM

TFMS/SWIM PKG 1

TFMS/SWIM PKG 2

TFMS/SWIM PKG 3

**SURVEILLANCE**

ADS-B Aircraft Standards

IMPLEMENT ADS-B GROUND INFRASTRUCTURE

ADS-B Aircraft Standards for NextGen

BEGIN DECOMMMISSIONING ATCBI-4/5 MODE S

**COMMUNICATIONS**

VOICE COMMUNICATION

Datalink Segment 2 Standards

DATA COMMUNICATIONS

SWIM GROUND SEGMENT

SWIM AIR SEGMENT

VSCS, ETVS ETC

NAS VOICE SWITCH

**NAVIGATION**

GBAS SBAS

BEGIN DECOMMISSIONING GROUND BASED NAVAIDS

GNSS Dual-Frequency Standards

**WEATHER**

WARP CIWS ITWS

NNEW

# Next Steps

- **Communicate with Industry and Advisory Councils**

- **Build OEP Version 2**

- **Communicate the "what"**

- **Engage FAA & the aviation community in defining the "how" and "when"**

**www.faa.gov/programs/oep**