Operational Evolution Partnership

Preview of Version 1

Federal Aviation
Administration

Presented to: 2007 ICNS Conference

By: Gisele Mohler, Director of OEP

Date: May 2007

Operational Evolution **Partnership**

Defining OEP Version 1

- **Defines framework for FAA's NextGen implementation plan**
  - Scope is broader than capacity

- **Demonstrates how FAA's integration & implementation plan will be executed**
  - To ensure development processes are not just parallel, but complementary

- **Provides high-level "big picture" content**

- **Initiates industry collaboration process**
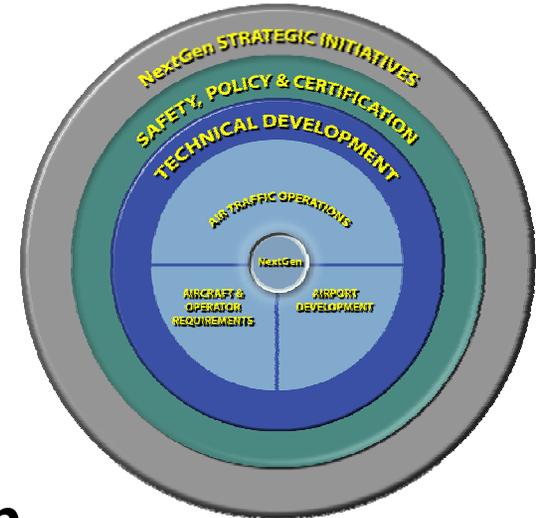
FAA is Already Using the new OEP

- **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

Defining the OEP Domains
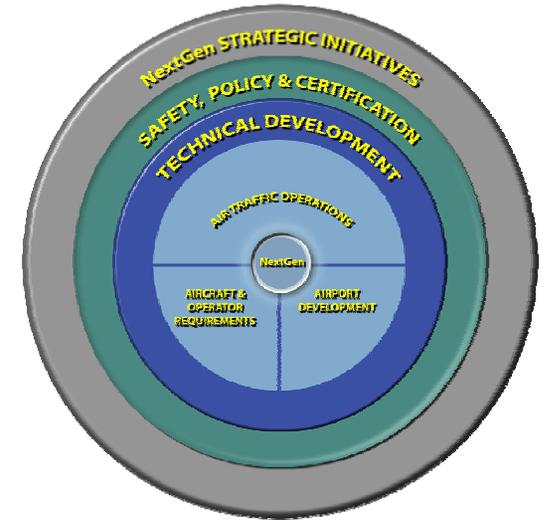
- **Airport Development: New concrete**
  - Keeps OEP 35 airports
  - Adds 15 metropolitan regions
  - Provides details about long-range planning

- **Aircraft & Operator Requirements: Avionics**
  - Derives a standard equipage package for NextGen

- **Air Traffic Operations: Transformational capabilities**
  - Capabilities are comprised of integrated cross-agency activities combine to change the system

Depiction
- Core = FAA Commitments
- Transition Rings = Related activities that are less mature
- Outer Transformational Ring = Proofs of concepts for NextGen
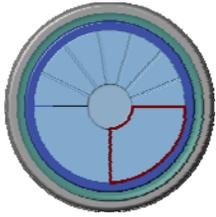
Airport Development Domain

Focus: Surface Capacity enhancements and delay reduction

- **2 Core Wedges**
  - **OEP Airports (35)**
  - **Metropolitan Regions (15)**

- **3 Rings**
  - **Long Term Strategic Initiatives**
  - **Planning**
  - **Environmental**

METRO AREA AIRPORTS

OEP AIRPORTS

Environmental

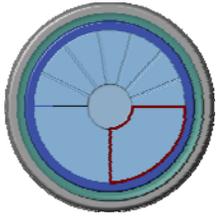Planning

Long Term Strategic Initiatives
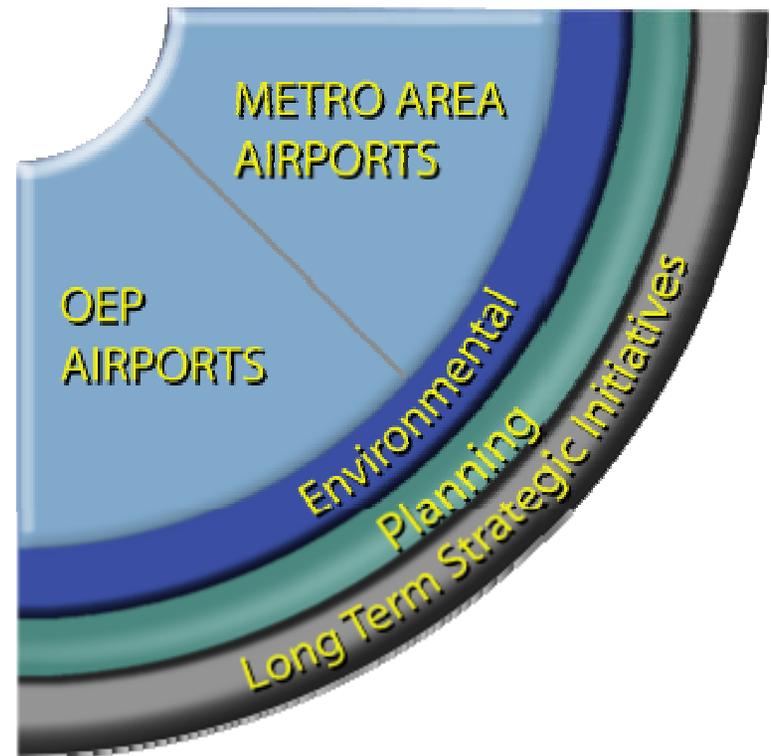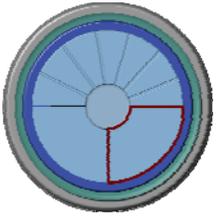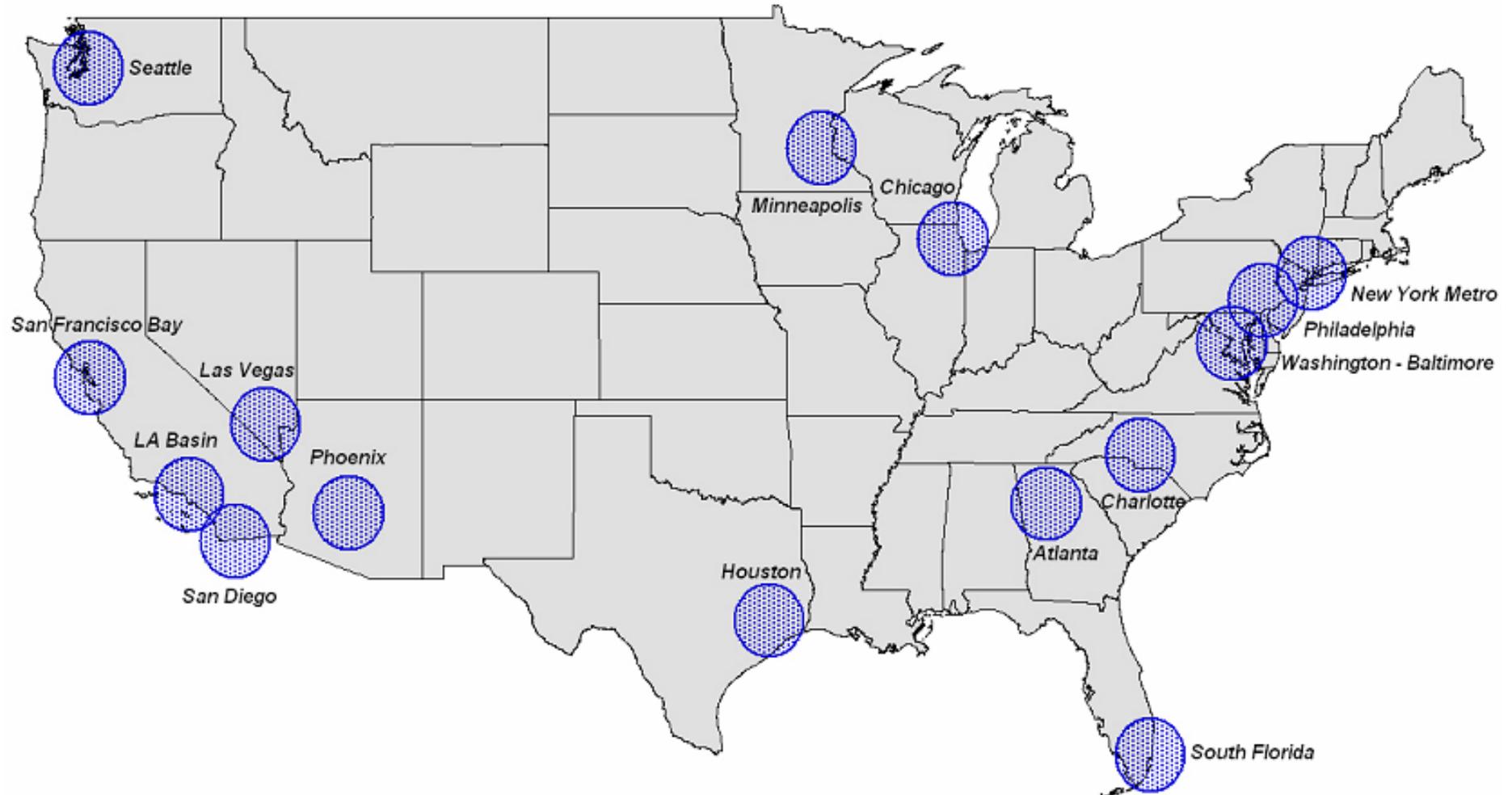
New to OEP
15 Metropolitan Regions

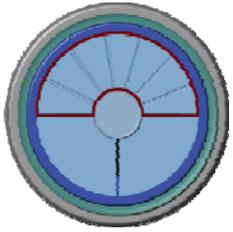**Over next 20 years, Nation's population & economic growth is expected to occur in 15 metropolitan areas**

– Promote regional planning

– Monitor aviation infrastructure investment in these regions

– Identify airports with potential to accommodate future demand

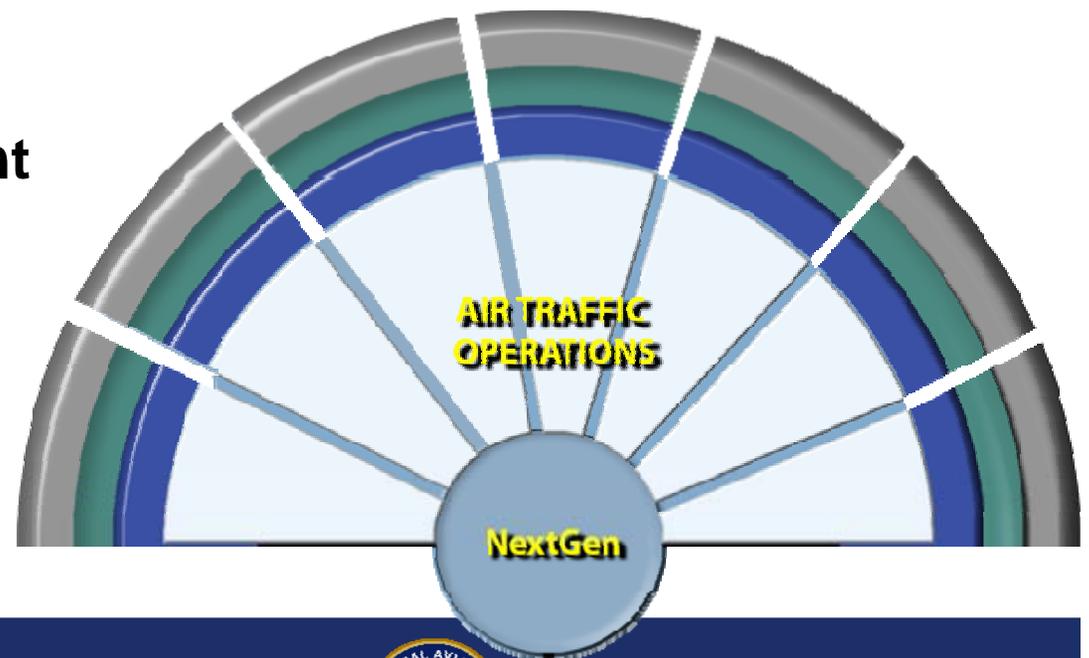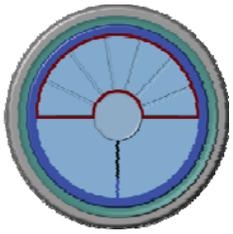# Metro Areas with Large Growth by 2025

Air Traffic Operations Domain

Focus: Capacity, efficiency, safety, and security of air transportation operations
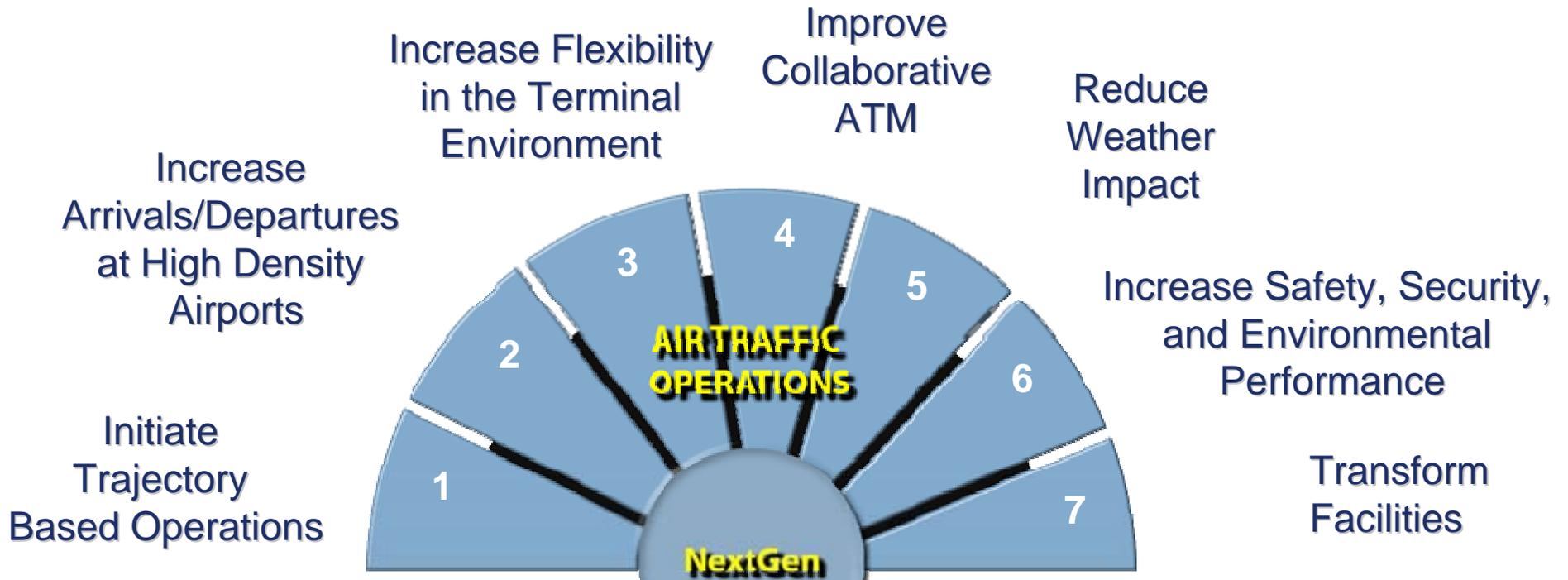
- **Implementation "Core"**

- **3 Rings**
  - **Technical Development**
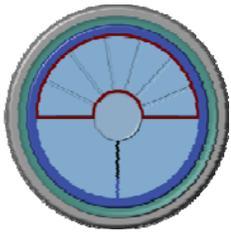 - **Safety, Policy & Certification**
  - **NextGen Strategic Initiatives**

Air Traffic Operations Domain

7 Solution Sets extend from core to rings

Increase Flexibility in the Terminal Environment

Improve Collaborative ATM

Reduce Weather Impact

Increase Arrivals/Departures at High Density Airports

Increase Safety, Security, and Environmental Performance

Initiate Trajectory Based Operations

Transform Facilities

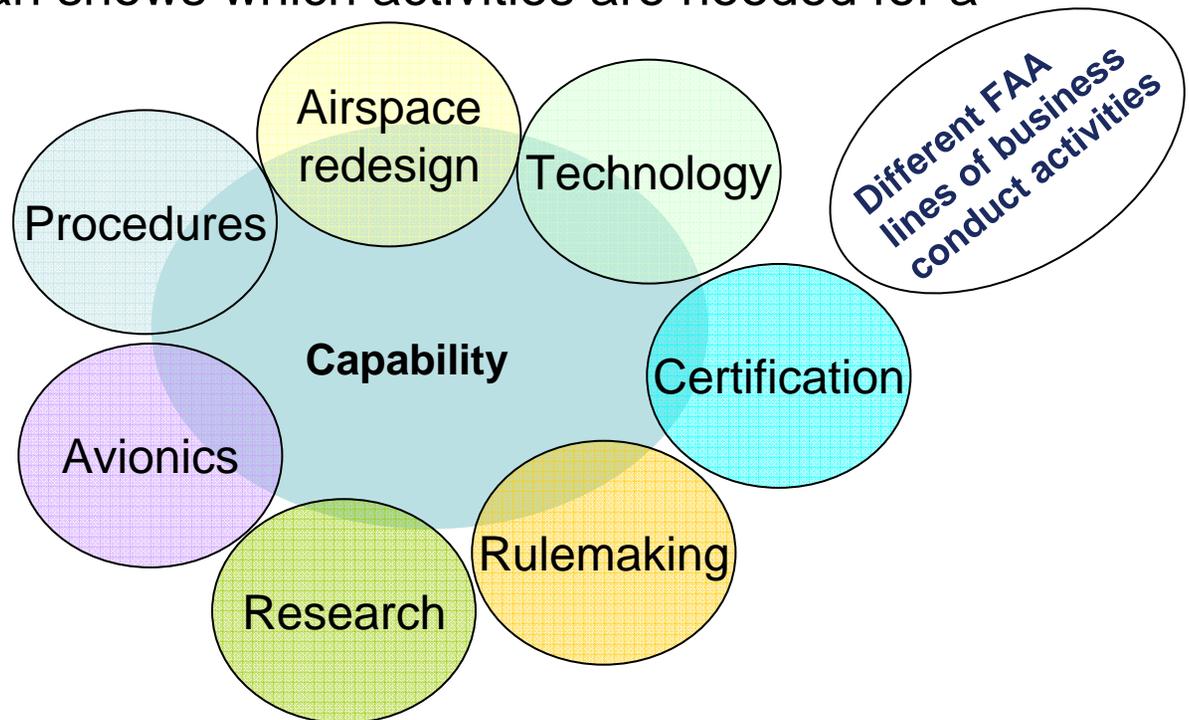AIR TRAFFIC OPERATIONS

NextGen

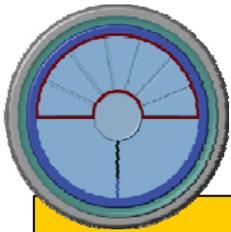1 2 3 4 5 6 7

Solution Sets contain "capabilities"

- OEP will provide cross-agency implementation plans for each capability

- Implementation plan shows which activities are needed for a given capability

Implementation Plans

A capability's implementation plan integrates activities from multiple sources

Procedures · Airspace redesign · Technology · Capability · Certification · Avionics · Research · Rulemaking

Different FAA lines of business conduct activities

NextGen Integration

Smart Sheets and Reference Sheets

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.
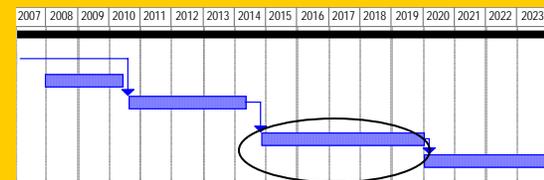
Procedures
Airspace redesign
Technology
Capability
Certification
Avionics
Rulemaking
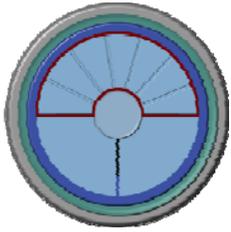Research
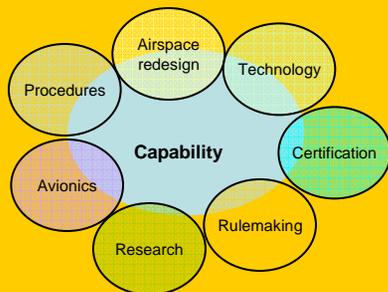
Implementation Plan

• Datacom Segment X

Reference Sheet

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

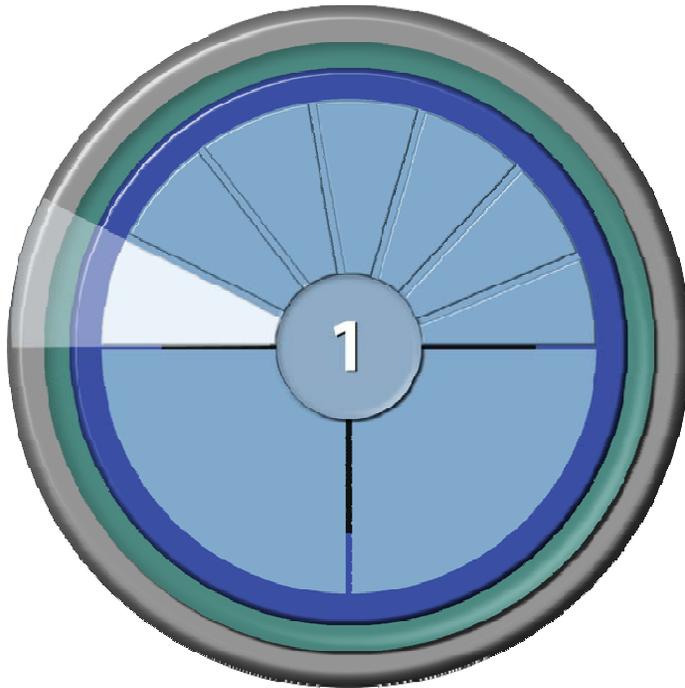• Includes program's timeline with all of its segments, as a cross-reference

Datacom
(NOTIONAL)

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

Example:
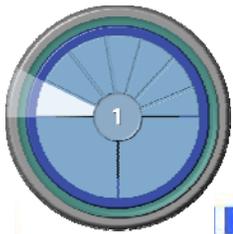## Initiate Trajectory Based Operations

What is TBO?

- Aircraft fly negotiated trajectories

- ATC moves to management by trajectory

- Aircraft are equipped for full participation in trajectory based operations

- Changes to roles, responsibilities, and procedures that support the move to trajectory based operations
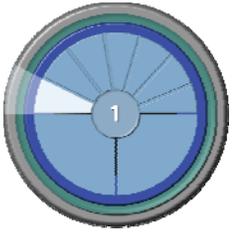
Initiate Trajectory Based Operations

- Tactical Separation Management:
    - Radar controller productivity optimized by enhanced automated conflict detection, resolution, and conformance monitoring

- Transition Clearances from voice to data

- Automating sector task management

- Variable separation based on wake and ops performance

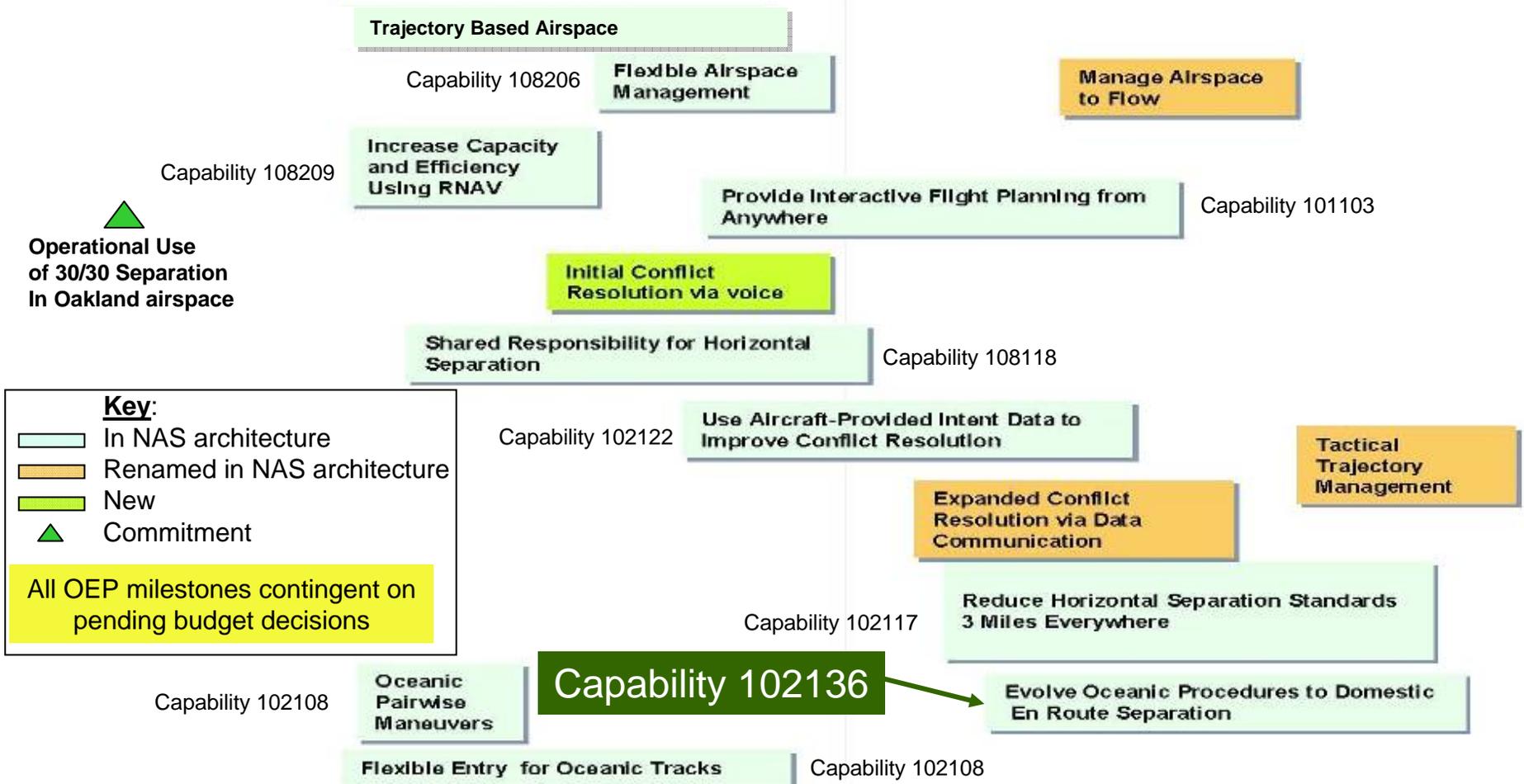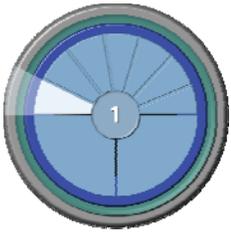- Real time assessment of tactical airspace changes and flow

Initiate Trajectory Based Operations
Notational Timeline

Trajectory Based Airspace

Capability 108206   **Flexible Airspace Management**

Manage Airspace to Flow

Capability 108209   **Increase Capacity and Efficiency Using RNAV**

Provide Interactive Flight Planning from Anywhere   Capability 101103

▲
**Operational Use
of 30/30 Separation
In Oakland airspace**

Initial Conflict Resolution via voice

Shared Responsibility for Horizontal Separation   Capability 108118

Key:
- ▭ In NAS architecture
- ▭ Renamed in NAS architecture
- ▭ New
- △ Commitment

All OEP milestones contingent on pending budget decisions

Capability 102122   **Use Aircraft-Provided Intent Data to Improve Conflict Resolution**

Tactical Trajectory Management

Expanded Conflict Resolution via Data Communication

Reduce Horizontal Separation Standards 3 Miles Everywhere

Capability 102117

Capability 102108   **Oceanic Pairwise Maneuvers**

Capability 102136 ⟶ **Evolve Oceanic Procedures to Domestic En Route Separation**

Flexible Entry for Oceanic Tracks   Capability 102108

Example of Capability 102136 linkage to NAS Enterprise Architecture

http://www.nas-architecture.faa.gov/nas/view_service/oi_extended.cfm?SVHID=102136
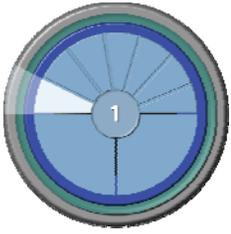
FY08 Activities for Trajectory Based Operations

- Oceanic Demonstration
  - Test various aspects of trajectory management in the oceanic environment
  - Show how oceanic flights using tailored routes can avoid congestion and take advantage of shorter routes

- Infrastructure Engineering
  - Accelerate the transition of Traffic Management Advisor (TMA) to Trajectory Based Operations
    - Provide better tools to predict point-in-space conflicts
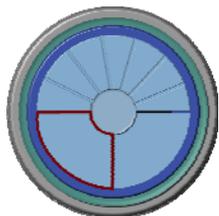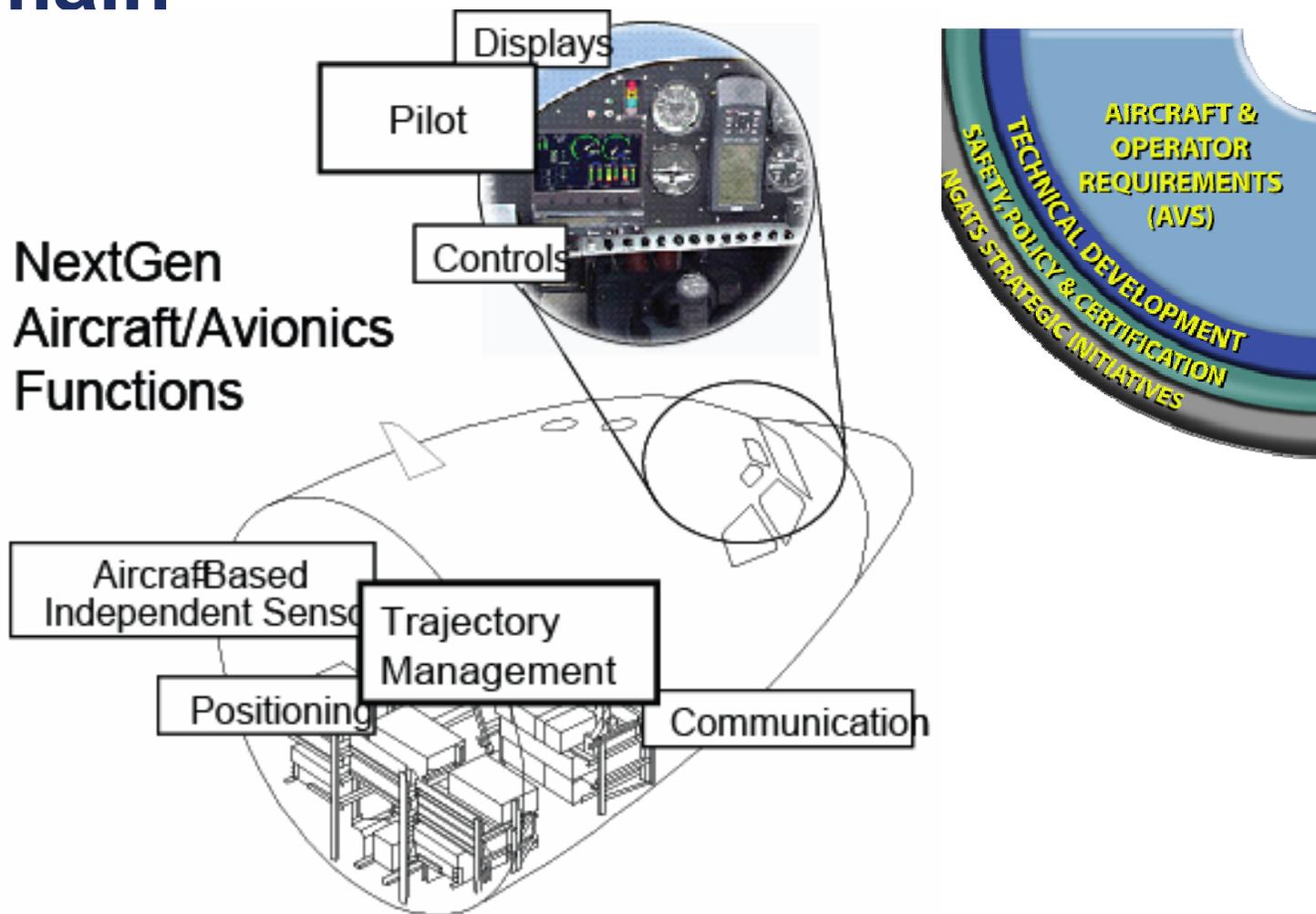 - Enable Trajectory-based Flight Planning
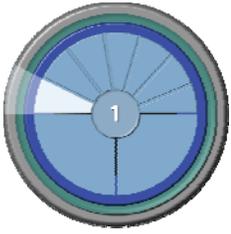
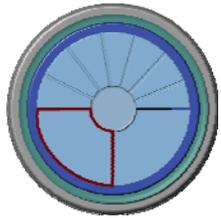# Key Enabling Technologies to Initiate Trajectory Based Operations

- ERAM Enhancements
- ADS-B
- SWIM
- Air-Ground Data Communication
- TFM Modernization
- Weather
- TMA
- ATOP

Aircraft & Operator Requirements Domain

NextGen Aircraft/Avionics Functions

Displays
Pilot
Controls

AircraftBased Independent Sensors
Positioning
Trajectory Management
Communication

AIRCRAFT & OPERATOR REQUIREMENTS (AVS)
TECHNICAL DEVELOPMENT
SAFETY, POLICY & CERTIFICATION
NGATS STRATEGIC INITIATIVES
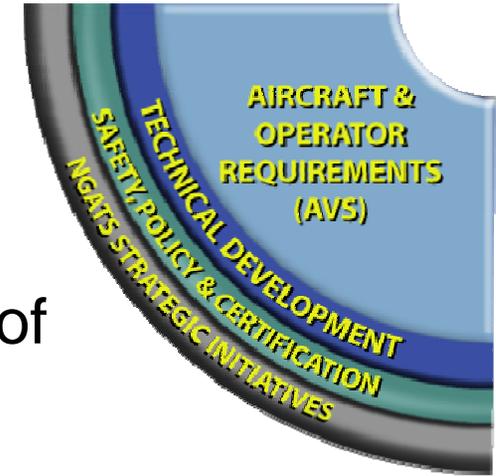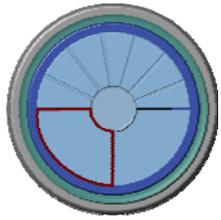
Aircraft & Operator Requirements Domain

- **Defining Aircraft Roadmap (Aircraft Infrastructure and Operations)**

  - JPDO expected to refine the functions of the NextGen aircraft

  - Discrepancies currently exist between Roadmaps

- **Policy, standards and guidance material should be considered from inception of project**
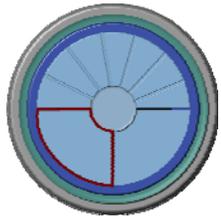
What is the Aircraft Roadmap?

- **Timeline of:**
  - Key aircraft and operational research
  - Implementation decisions affecting aircraft equipment
  - Certification and operational standards and criteria to support adoption of a particular capability
  - Strawman to serve for understanding and collaboration on [proposed] Operational Improvements
- **Must link to ATO Roadmaps for planned services**
- **Also must address aircraft-centered operations**
  - Delegated separation, autonomous navigation, etc.

What is it Not?

- **NOT -- Aircraft architecture or equipment**

- **NOT -- roadmap of functions YOU should buy or when**
  - Aircraft fleet remains very diverse
  - Focus of Roadmap is on *first* aircraft through the enabling standards and criteria

How Can Industry Use OEP Version 1?

- You will see how the agency is responding to the NextGen vision

- OEP will lay out ground-based and airframe infrastructure so you can plan strategically

Where are we now?

- **Working with FAA lines of business to build and validate content**
  - On going

- **Held an OEP Industry Day at RTCA Symposium, March 13-14**
  - Shared outcome and capability descriptions with industry; gathered feedback

- **Will Publish OEP Version 1 in June 2007**
  - Focusing on the framework of path to NextGen
  - Determining date for OEP Version 2