



Federal Aviation
Administration



Appendix B

Delivering the Mid-Term Vision

*Excerpts from the FAA's NextGen Implementation Plan, March 2011,
available at www.faa.gov/nextgen*

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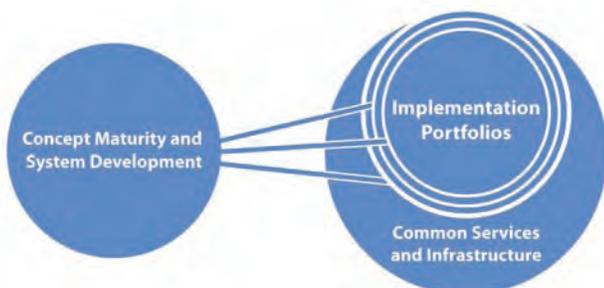
Appendix B Delivering the Mid-Term Vision

This appendix provides a timeline and a summary of the FAA's key work plans in support of delivering the operational improvements necessary to achieve our vision of operations for the NextGen mid-term. The integrated work plans developed by the agency to deliver the mid-term system support the required tracking, planning, reporting and execution needed to successfully implement an integration project of the magnitude of NextGen.

This year we have chosen an operational orientation for presenting the highlighted work activities that support our mid-term vision, rather than the budget orientation we offered last year. Our work activity tables do, however, provide a reference to the funding mechanisms which support those particular projects.

Each mid-term operational improvement, as identified in the National Airspace System Enterprise Architecture (NAS EA), has been broken down into a series of capabilities that can be deployed as they reach maturity. In many cases, these capabilities provide immediate user benefits while contributing to the development of the operational improvements they support. The capabilities we expect to achieve operational status or be available to NAS users by the mid-term have been defined, and are organized into the following nine implementation portfolios:

- Improved Surface Operations
- Improved Approaches and Low Visibility
- Closely Spaced, Parallel, Converging, and Intersecting Runway Operations
- Performance Based Navigation
- Time Based Flow Management
- Collaborative Air Traffic Management
- Automation Support for Separation Management
- On-Demand NAS Information
- Environment and Energy



Additionally, our Common Services and Infrastructure portfolio documents cross-cutting enablers that support the capabilities included in the implementation portfolios.

Operational improvements and associated capabilities that are still being clearly defined are included in our NextGen Maturity and System Development portfolio.

As we continue our development work in support of those later capabilities, we may need to make adjustments to our portfolio structure as well as our schedules. A variety of factors such as program interdependencies, a realignment of priorities or other external drivers could potentially impact the assumptions under which this work plan has been crafted.

At the top of each portfolio is a visual representation of the relationship between the operational improvements and affected phases of flight. Below this graphic is the list and description of the operational improvements and the supporting capabilities. Where appropriate, these descriptions include a reference to the supporting Common Services, as well as an indication as to whether

that operational improvement or capability supports a recommendation of the RTCA NextGen Mid-Term Implementation Task Force.

In the next section, we provide timelines for the implementation of the operational improvements and supporting capabilities. Capability timelines are color-coded to make it easier to discern when a project is in the concept phase or the development phase, or when it will be operational or available for use in the NAS. Operational improvement timelines illustrate the date range during which the operational improvement will reach initial operational capability in the NAS. An arrow indicates that the improvement or capability continues in operation.

Finally, the bottom section lists selected elements of the work being done to achieve the NextGen mid-term operational vision. It also indicates an activity's budget line as well as the activity's relationship to the RTCA task force recommendations and to the NAS EA, as denoted by the operational improvements (OIs).

This section shows the phases of flight improved by the operational improvements in the implementation portfolio. The numbered hexagons correspond to the operational improvements listed below.

Operational Improvement

- 1 OI 19415: Current Traffic Management of Flow in the S1 Route for High Density Airports
- 2 OI 19423: Time Based Metering Using RNAV and RNP Route Assignments
- 3 OI 19422: Time Based Metering Using RNAV and RNP Route Assignments
- 4 OI 19428: Point-in-Space Metering
- 5 OI 19417: Improved Arrival, Surface, Departure, Flow Operations
- 6 OI 19411: Improved Arrival, Surface, Departure, Flow Operations

Capability

- 1 OI 19415: Current Traffic Management of Flow in the S1 Route for High Density Airports
- 2 OI 19423: Time Based Metering Using RNAV and RNP Route Assignments
- 3 OI 19422: Time Based Metering Using RNAV and RNP Route Assignments
- 4 OI 19428: Point-in-Space Metering
- 5 OI 19417: Improved Arrival, Surface, Departure, Flow Operations
- 6 OI 19411: Improved Arrival, Surface, Departure, Flow Operations

Capability Description

- 1 OI 19415: Current Traffic Management of Flow in the S1 Route for High Density Airports
- 2 OI 19423: Time Based Metering Using RNAV and RNP Route Assignments
- 3 OI 19422: Time Based Metering Using RNAV and RNP Route Assignments
- 4 OI 19428: Point-in-Space Metering
- 5 OI 19417: Improved Arrival, Surface, Departure, Flow Operations
- 6 OI 19411: Improved Arrival, Surface, Departure, Flow Operations

Task Force Recommendation Information

- 1 OI 19415: Current Traffic Management of Flow in the S1 Route for High Density Airports
- 2 OI 19423: Time Based Metering Using RNAV and RNP Route Assignments
- 3 OI 19422: Time Based Metering Using RNAV and RNP Route Assignments
- 4 OI 19428: Point-in-Space Metering
- 5 OI 19417: Improved Arrival, Surface, Departure, Flow Operations
- 6 OI 19411: Improved Arrival, Surface, Departure, Flow Operations

Operational Improvement Description

In this space, we list and describe the operational improvements and supporting capabilities in the implementation portfolio. We also indicate where the operational improvement/capability supports a recommendation of the RTCA NextGen Mid-Term Implementation Task Force.

Supporting Common Services

This section contains the timelines for achieving the operational improvements and capabilities included in the portfolio. Color-coded timelines indicate whether a capability is in the concept or development phase, or when it will be operational or available to NAS users. Operational improvement timelines depict when the majority of the work necessary to develop and deploy the associated capabilities will be completed. Arrows indicate that the improvement or capability continues.

Operational Improvement Timeline

Capability Timeline

Status Color-Code Key

This section lays out selected NextGen work and activities that the FAA completed last year, and that the FAA plans to engage in through the mid-term.

Activity	Task	Activity	Description	UI	FY 2010	FY 2011	FY 2012 - Mid-term
19415	1	Time Based Metering of Flow in the S1 Route for High Density Airports	Provides a consistent flow of traffic to the runway using TBM. TBM is an Air Route Traffic Control Center (ARTCC) based approach that allows for a consistent flow of traffic through the use of TBM.	19415	✓	✓	✓
19423	2	Time Based Metering Using RNAV and RNP Route Assignments	RNAV (RNAV) Route Performance Based Navigation (PBN) and Time Based Metering (TBM) provide efficient use of airspace and capacity in high-density airport environments. Metering information will manage the flow of aircraft to meet flow, then permitting efficient use of airspace and capacity.	19423	✓	✓	✓
19422	3	Time Based Metering Using RNAV and RNP Route Assignments	RNAV (RNAV) Route Performance Based Navigation (PBN) and Time Based Metering (TBM) provide efficient use of airspace and capacity in high-density airport environments. Metering information will manage the flow of aircraft to meet flow, then permitting efficient use of airspace and capacity.	19422	✓	✓	✓
19428	4	Point-in-Space Metering	Point-in-Space Metering (PIS) uses scheduling tools and trajectory-based operations to ensure smooth flow of traffic and increase the overall use of airspace.	19428	✓	✓	✓
19417	5	Improved Arrival, Surface, Departure, Flow Operations	This OI integrates advanced arrival/surface flow management with advanced surface operation functions to improve arrival capacity and efficiency.	19417	✓	✓	✓
19411	6	Improved Arrival, Surface, Departure, Flow Operations	This OI integrates advanced arrival/surface flow management with advanced surface operation functions to improve arrival capacity and efficiency.	19411	✓	✓	✓

Budget Line(s) under which the Work or Activity Falls

RTCA Task Force Operational Capabilities Supported

Work or Activity

Description of the Work or Activity

Work Activities Planned for FY 2013 - Mid-term

Work Activities Planned for FY 2011

Work Activities Completed in FY 2010

Operational Improvements Supported

Improved Surface Operations



1 OI 104209: Initial Surface Traffic Management

Departures are sequenced and staged to maintain throughput. Air Navigation Service Provider (ANSP) automation uses departure-scheduling tools to flow surface traffic at high-density airports.

Task Force: Surface

Airport Configuration Management

To improve responsiveness and effective use of airport resources, and rapidly coordinate airport configuration changes across multiple ANSP activities, this capability provides automation assistance for setting up, assessing and changing the airport configuration.

Supported By: Aeronautical and Surveillance Common Services

Runway Assignments

To assist in efficient runway allocation and use, the automation assigns an aircraft to a runway based on the flight's departure fix and enables ANSP personnel to accept or modify the runway assignment.

Supported By: Aeronautical and Surveillance Common Services

Scheduling and Sequencing

The capability displays the departure surface sequence and runway queues as a recommendation to the controller to improve throughput. The capability provides Traffic Flow Management (TFM) constraints to tower controllers. The capability provides estimated flight-specific event times necessary to meet the departure surface sequence and schedule. These event times are shared with users.

Supported By: Aeronautical and Surveillance Common Services

Taxi Routing

For improved taxi route efficiency, this capability provides dynamic information on airport taxiways and runways integrated with controller displays.

Supported By: Aeronautical and Surveillance Common Services

Departure Routing

For improved departure operations, this capability provides tower controllers with electronic flight data management and an interface to assessments of weather and Traffic Management Initiative (TMI) impacts on departure routes and associated flights.

Supported By: Surveillance Common Service

External Data Exchange

The FAA will establish a data exchange infrastructure as well as integrated decision support tools, standards and processes that rely on agreed-to information exchange among stakeholders.

*Supported By: Aeronautical, Flight and Surveillance Common Services
Task Force: Surface Situational Awareness Phase 1 (40), TFM Common Operational Picture (43), Surface Connectivity (38) and Surface Situational Awareness Phase 2 (41)*

2 OI 103207: Improved Runway Safety Situational Awareness for Controllers

At large airports, current controller tools provide surface displays and can alert controllers when aircraft taxi into areas where a runway incursion could result. Additional ground-based capabilities will be developed to improve runway safety that include expansion of runway surveillance technology (i.e., Airport Surface Detection Equipment-Model X (ASDE-X)) to additional airports.

Task Force: Surface

ASDE-X to Additional Airports

This increment enables air traffic control (ATC) to detect potential runway conflicts by providing detailed coverage of movement on runways and taxiways.

*Supported By: Surveillance Common Service
Task Force: Surface Situational Awareness, Phase 1 (40)*

3 OI 103208: Improved Runway Safety Situational Awareness for Pilots

Runway safety operations are improved by providing pilots with improved awareness of their location on the airport surface as well as runway incursion alerting capabilities. Additional enhancements may include the depiction of other traffic within the airport surface environment.

Surface Indications and Alerts

Surface Indications and Alerts (SURF IA) is a runway safety application for flight crews of aircraft with Cockpit Display of Traffic Information (CDTI)/Traffic Information Services-Broadcast (TIS-B)/Automatic Dependent Surveillance-Broadcast (ADS-B), where situations that may lead to or already represent a collision risk are highlighted on the moving map. Avionics for SURF IA are likely to require software and display quality assurance levels higher than those for CDTI only.

Moving Map with Own-Ship Position

Cockpit displays, for instance Electronic Flight Bags (EFBs), may incorporate airport moving map displays that provide constantly changing views of an airport's runways, taxiways and structures to help pilots identify the airplane's location on the surface.

Supported By: Aeronautical Common Service

3 Cont'd

CDTI with TIS-B and ADS-B for Surface

Surface traffic information for moving map displays is available via TIS-B and from aircraft operating with approved ADS-B capability. Using TIS-B and ADS-B, CDTI will provide a graphical depiction of ground and air traffic, which will improve situational awareness for a variety of operations.

Supported By: Surveillance Common Service

Enhanced Vision Systems (EVs) for Taxi

The FAA and industry are partnering to develop a taxi benefit for aircraft equipped with certified enhanced vision systems when ground visibility at a Part 139 airport is below the minimum visibility required for surface operations, as outlined in the airport's Surface Movement Guidance and Control System plan.

4 OI 104207: Enhanced Surface Traffic Operations

Terminal automation provides the ability to transmit automated terminal information, departure clearances and amendments, and taxi route instructions via data communications, including hold-short instructions.

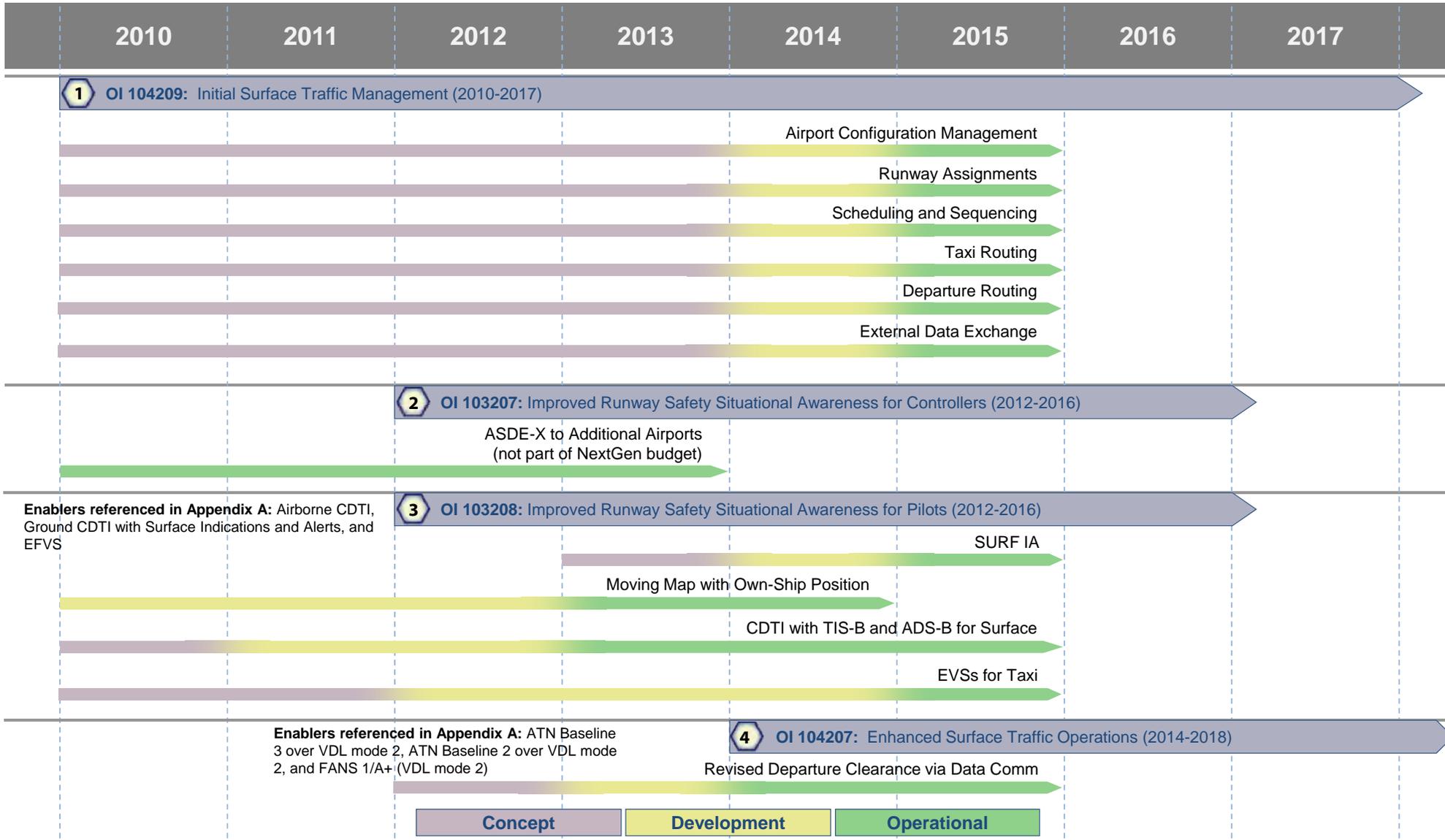
Task Force: Cross-Cutting

Revised Departure Clearance via Data Comm

A Revised Departure Clearance (DCL) Data Comm capability will allow the FAA to rapidly issue departure clearance revisions, due to weather or other airspace issues, to one or more aircraft equipped with Future Air Navigation System (FANS) waiting to depart.

Supported By: Communications Common Service

Task Force: Data Communications for Revised Departure Clearance, Weather Reroutes and Routine Communications (39)



Improved Surface Operations (cont'd)

Selected Work Activities

Budget Line	Task Force	Activity	Description	OIs	FY 2010	FY 2011	FY 2012 – Mid-term
Arrivals/ Departures at High Density Airports	40 43 38 41	Trajectory Management - Surface Tactical Flow	Focuses on the development of surface-based trajectory operations and provides a roadmap for the development of a collaborative Surface Traffic Management System.	104209	✓ Conducted field evaluation of Flight Operation Surface Application (FOSA) version 2 and Collaborative Departure Queue Management (CDQM) version 2 at Memphis and Orlando (11/30/10)	<ul style="list-style-type: none"> Conduct field evaluations of 2D Taxi Route Generation, Departure Runway Assignment, Airport Configuration, Departure Sequencing tools and Deice Tool 	<ul style="list-style-type: none"> Support technology transfer of mature surface capabilities to Tower Flight Data Manager (TFDM) system Continue Surface Trajectory Based Operation (STBO) field evaluations at Memphis and Orlando Conduct Human-in-the-Loop (HITL) simulation of Collaborative Departure Scheduling Conduct HITL simulation of Time-Based Taxi Route Generation Tool Begin HITL simulation of STBO Taxi Route Generation
Arrivals/ Departures at High Density Airports	40	Trajectory Management - Surface Tactical Flow - Enhanced Data Exchange (EDX) for Airport Surface Data Distribution	Establishes a net-centric approach to deliver ASDE-X to external aviation stakeholders.	104209	✓ Conducted operational prototype with ASDE-X data ready for external users	<ul style="list-style-type: none"> Add additional airports to EDX capability Enhance Infrastructure to improve reliability 	
Flexible Terminal Environment	43 38 9 41	Flight and State Data Management, Surface/Tower/Terminal Systems Engineering	Redefines and extends the TFDM and Arrival/Departure Management Tool (A/DMT) concept of operations, funding will be used to update current analysis proposals and assess acquisition risks.	103207 104209 102406		<ul style="list-style-type: none"> Conduct TFDM evaluations and demonstrations Conduct HITLs to finalize TFDM concept of use 	<ul style="list-style-type: none"> Continue the development, installation, test and operation of a pre-production unit of A/DMT with appropriate interfaces with En Route Automation Modernization (ERAM)/Traffic Management Advisor (TMA), TFM/ Integrated Departure/Arrival Capability (IDAC), TRACON, Route Availability Planning Tool (RAPT) Coordinate with an airport authority and aircraft/airlines at an operational site to support analysis and assessment of near-term benefits available from the A/DMT including: <ul style="list-style-type: none"> Departure route assurance to reduce departure delays Reduce departure queue lengths to reduce emissions/fuel burn Taxi conformance monitoring to improve airport operations Enhanced situational awareness to enhance airport safety Develop concept of operations for TFDM Phase 2 Develop TFDM Phase 2 prototype Conduct demonstrations of TFDM Phase 2

Budget Line	Task Force	Activity	Description	OIs	FY 2010	FY 2011	FY 2012 – Mid-term
Arrivals/ Departures at High Density Airports		Trajectory Management - Surface Conformance Monitoring	Focuses on the potential safety and workload benefits that can be achieved through a comprehensive taxi route management and conformance monitoring capability.	104209	✓ Conducted second Surface Conformance (2D) HITL simulations using hold short and give way instructions	<ul style="list-style-type: none"> • Conduct third Surface Conformance (2D) HITL simulations 	<ul style="list-style-type: none"> • Continue conducting Surface Conformance (2D) HITL simulations • Tech transfer of 2D Surface Conformance Monitoring concept of use, requirements, ATC Procedures to TFDM program • Initial HITL simulation of STBO Surface Conformance Monitoring • Update concept of use, requirements, ATC Procedures for STBO Surface Conformance Monitoring

Improved Approaches and Low-Visibility Operations



1 OI 107119: Expanded Low-Visibility Operations Using Lower RVR Minima

Lowering Runway Visual Range (RVR) minima from 2,400 feet to 1,800 feet (or lower, depending on the airport and requirement) at selected airports using RVR systems, aircraft capabilities, and procedural changes provides greater access to Operational Evolution Partnership (OEP), reliever and feeder airports during low-visibility conditions.

Additional RVR Sensors

Supported By: Aeronautical and Weather Common Services

2 OI 107117: Low-Visibility/Ceiling Approach Operations

The ability to complete approaches in low-visibility/ceiling conditions is improved for aircraft equipped with some combination of navigation derived from augmented Global Navigation Satellite System (GNSS) or Instrument Landing System (ILS) and other cockpit-based technologies or combinations of cockpit-based technologies and ground infrastructure.

Enhanced Flight Vision System (EFVS) to 100 Feet

The FAA is engaged in making new rules to enhance the benefits of having EFVS capability by allowing operators to dispatch and begin instrument approaches in more weather conditions than currently authorized.

Synthetic Vision System (SVS) for Lower Than Standard Approach Minima Operations

The FAA is evaluating various concepts for allowing SVS technology to be used to conduct instrument approach procedures with lower than standard minima (e.g., Cat II, SA Cat I, SA Cat II), or in lieu of certain ground infrastructure.

3 OI 107103: Area Navigation (RNAV) Standard Instrument Departures (SIDs), Standard Terminal Arrival Routes (STARs) and Approaches

Task Force: NAS Access

Localizer Performance with Vertical Guidance (LPV) Approach Procedures

LPV approach procedures, which are available to aircraft equipped with GPS/ Wide Area Augmentation System (WAAS), are more cost-effective to implement in comparison with the installation of additional ground-based navigation aids (NAVAIDs) and the development of approach procedures for those NAVAIDs. In addition to LPV approach procedure implementation, the FAA will deliver LP approaches to runways that do not qualify for LPVs due to obstacles.

Supported By: Aeronautical Common Service

Task Force: Implement LPV Approach Procedures to Airports without Precision Approach Capabilities (22)

Required Navigation Performance (RNP) and RNP Authorization Required (AR) Approaches

A key feature of RNP and RNP AR approaches is the ability to use curved, guided path segments (known as radius-to-fix, or RF; currently, an optional capability in aircraft flight management systems). Another important advantage of RNP AR approaches is the potential for decoupling operations associated with adjacent runways or airports.

Supported By: Aeronautical Common Service

4 OI 104124: Use Optimized Profile Descent

Optimized Profile Descents (OPDs) permit aircraft to remain at higher altitudes on arrival to the airport and use lower power settings during descent.

Task Force: Cross-Cutting

OPDs Using RNAV and RNP STARs

OPD procedures are being implemented as RNAV STARs (eventually as RNP STARs, where necessary) with vertical profiles that are designed to allow aircraft to descend using reduced or even idle thrust settings from the top of descent to points along the downwind or final approach.

Supported By: Aeronautical Common Service

Initial Tailored Arrivals (ITAs)

ITAs are pre-planned, fixed routings assigned by oceanic air traffic control facilities and sent from the Oceanic Automation System (Ocean21) via data communications to suitably equipped (i.e., FANS 1/A) aircraft as an arrival clearance into coastal airports.

Supported By: Communications Common Service

Task Force: Communications for Revised Departure Clearance, Weather Reroutes and Routine Communications (42a)

5 OI 107107: Ground Based Augmentation System (GBAS) Precision Approaches

GBAS support precision approaches to Category I and eventually Category II/III minimums, for properly equipped runways and aircraft. GBAS can support approach minimums at airports with fewer restrictions to surface movement, and offers the potential for curved precision approaches. GBAS also can support high-integrity surface movement requirements.

GBAS Category I Non-Federal System Approval

GBAS Category I is being implemented as a non-federal system on a per-airport request basis.

GBAS Category II/III

ICAO-compliant standards for operational use of GBAS Category II/III systems will be published by 2015.

6 OI 107118: Low-Visibility/Ceiling Landing Operations

The ability to land in low-visibility/ceiling conditions is improved for aircraft equipped with some combination of navigation derived from augmented GNSS or ILS, and head-up guidance systems, EFVS, SVS, advanced vision system, and other cockpit-based technologies that combine to improve human performance.

EFVS to Touch down

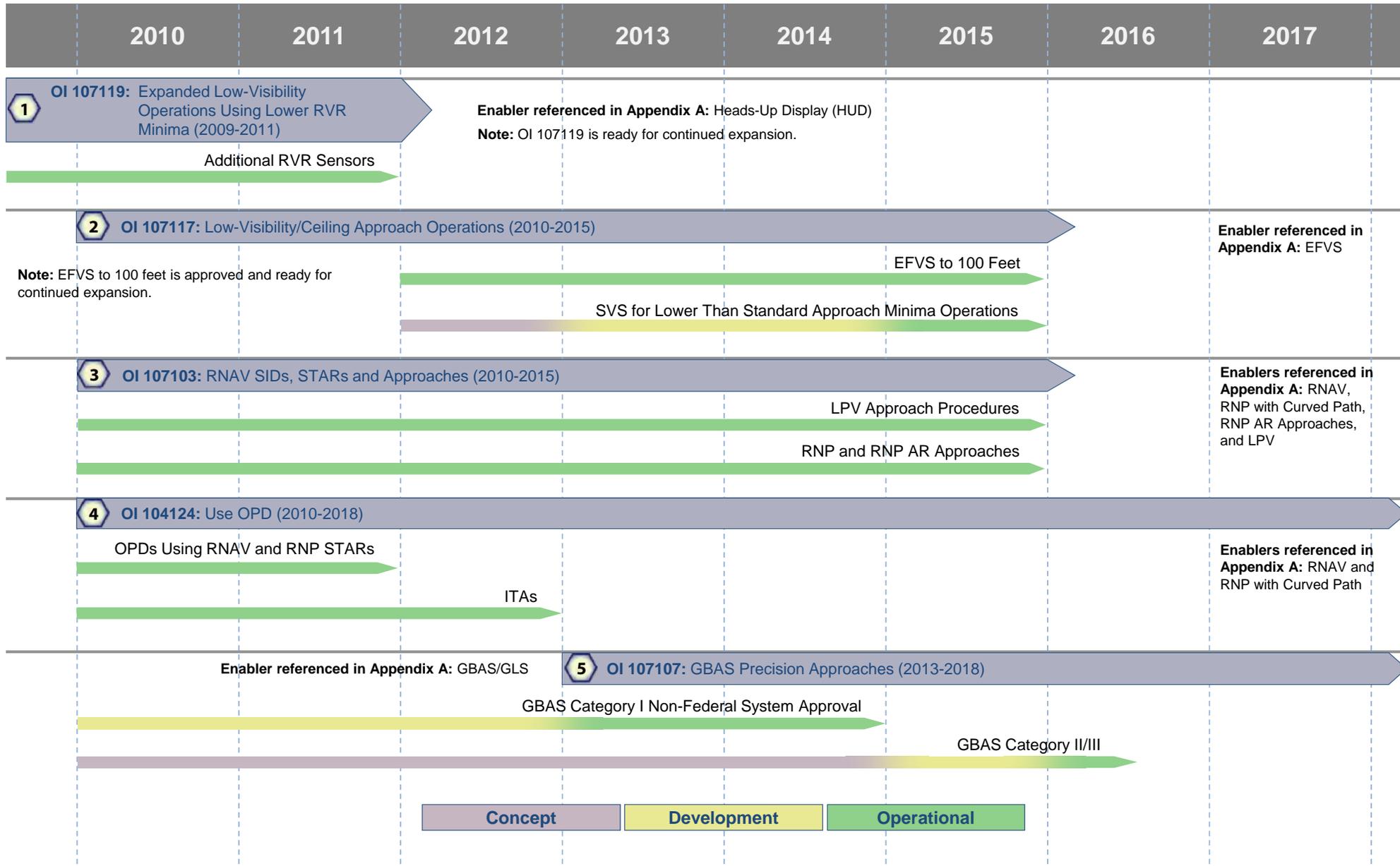
The FAA is engaged in rulemaking that would permit EFVS to be used to touch down.

7 OI 107115: Low-Visibility/Ceiling Take-off Operations

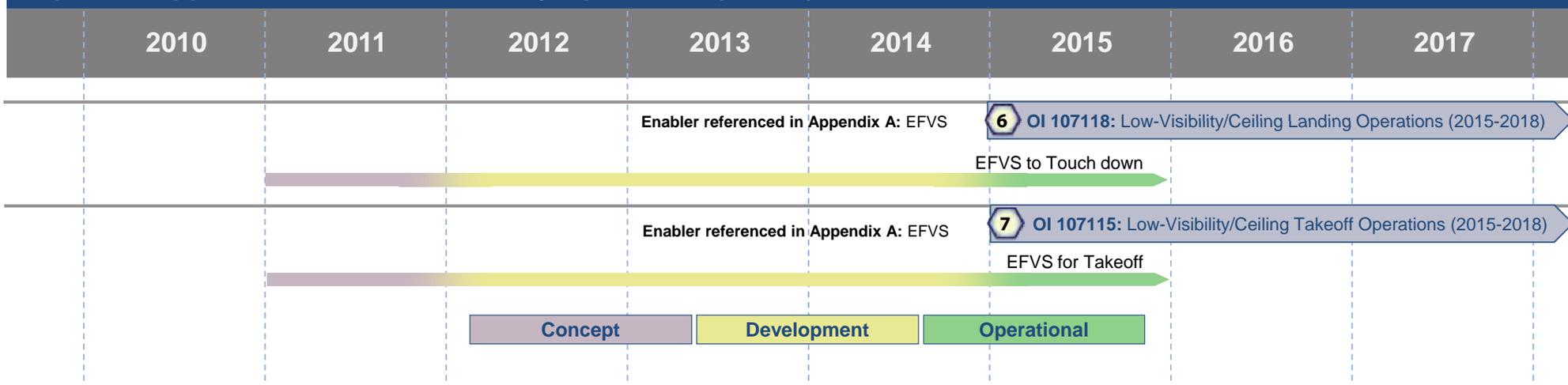
Leveraging a combination of head-up guidance systems, EFVS, SVS, or advanced vision system capabilities will allow appropriately equipped aircraft to conduct takeoff operations with lower visibility minima.

EFVS for Takeoff

The FAA is evaluating the use of EFVS for low-visibility takeoff operations.



Improved Approaches and Low-Visibility Operations (cont'd)



Selected Work Activities

Budget Line	Task Force	Activity	Description	OIs	FY 2010	FY 2011	FY 2012 – Mid-term
Flexible Terminal Environment		Separation Management, Approaches, Ground Based Augmentation System (GBAS)	Begins implementation of GBAS at the nation's busiest airports (OEP 35) to achieve capacity and efficiency benefits by integrating RNAV and RNP capabilities with the Category 1 GBAS Landing System capability.	107107	✓ Awarded Category II/III Local Area Augmentation System ground facility prototype contract		<ul style="list-style-type: none"> Finalize Category III ground facility specification Award contract to validate Category III avionics standards and interoperability Complete operational feasibility determination
Flexible Terminal Environment		Separation Management, Approaches, NextGen Navigation Initiatives	Develops and baselines specifications and initiates solution development including acquisition and testing of navigation aid equipment.	107119	✓ Completed initial concept of operations for navigation surface requirements	<ul style="list-style-type: none"> Implement lower RVR minimums at: <ul style="list-style-type: none"> Philadelphia (PHL) 27R San Francisco (SFO) 28L Denver (DEN) 16R Houston International (IAH) 9 Cleveland (CLE) 24L 	<ul style="list-style-type: none"> Complete initial concept of operations for Navigation Surface Requirements Based on the Flight Standards NAS-wide implementation schedule for terminal RNAV, devise the roll-out schedule for required navigation systems Define current arrival variability, runway occupancy times (day/light, clear/low-visibility) as a baseline to improving exiting from the runway Define a future set of taxi-out and taxi-in time-based performance requirements that reduce variability in surface operations. Use these requirements to assess the current performance at OEP airports to define how much change will be needed and the feasibility of those changes

Budget Line	Task Force	Activity	Description	OIs	FY 2010	FY 2011	FY 2012 – Mid-term
Flexible Terminal Environment		Separation Management, Approaches, Optimize Navigation Technology	Develops and baselines specifications and initiates solution development including acquisition and testing of navigation aid equipment.	107118 107119	✓ Completed Enhanced Low Visibility operational improvements	<ul style="list-style-type: none"> Continue initial development and design of Medium-Intensity Approach Lighting System with Runway Alignment Indicator (MALSR) Light-Emitting Diode (LED) Lamp Solution Continue initial development and design of LED Precision Approach Path Indicator (PAPI) System Solution 	<ul style="list-style-type: none"> Complete MALSR LED/Infrared lamps prototype design Complete functional configuration audit for LED PAPI
Demonstrations	42a	High Density Airport Capacity and Efficiency Improvement Project	Makes arrivals to high density airports more efficient; it has several implications such as reduced time and distance of flights including the optimization of the lateral and vertical paths.		✓ Continued TAs at LAX, SFO and MIA		

Closely Spaced, Parallel, Converging and Intersecting Runway Operations



1 OI 108209: Increase Capacity and Efficiency Using Area Navigation (RNAV) and Required Navigation Performance (RNP)

Both RNAV and RNP will enable more efficient aircraft trajectories. RNAV and RNP combined with airspace changes, increase airspace efficiency and capacity.
Task Force: Runway Access

Use Converging Runway Display Aid (CRDA)
 This increment will add CRDA functionality into terminal automation systems and expand its use at more airports, as well as leverage the arrival/departure window tool.
Task Force: Increase Capacity and Throughput for Converging and Intersecting Runways (9)

2 OI 102140: Wake Turbulence Mitigation for Departures (WTMD): Wind-Based Wake Procedures

Procedures are developed at applicable locations based on the results of analysis of wake measurements and safety analysis using wake modeling and visualization. During peak demand periods, these procedures allow airports to maintain airport departure throughput during favorable wind conditions.

WTMD
 Procedures are developed through analysis of wake measurements and safety analysis using wake modeling and visualization. During peak demand periods, these procedures allow airports to maintain airport departure throughput during favorable wind conditions. A staged implementation of changes in procedures and standards, as well as the implementation of new technology, will safely reduce the impact of wake vortices on operations. This reduction applies to specific types of aircraft and is based on wind blowing an aircraft's wake away from the parallel runway's operating area.

3 OI 102141: Improved Parallel Runway Operations

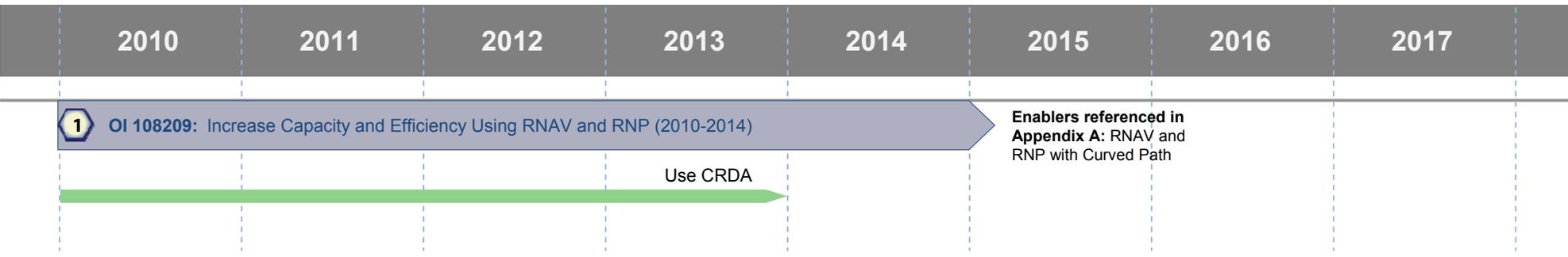
This improvement will explore concepts to recover lost capacity through reduced separation standards, increased applications of dependent and independent operations, enabled operations in lower visibility conditions and changes in separation responsibility between air traffic control (ATC) and the flight deck.
Task Force: Runway Access

Additional 7110.308 Airports
 This increment provides airports with maximum use of closely spaced parallel runways by authorizing participating aircraft to operate at reduced lateral and longitudinal spacing on dependent, instrument approach procedures to runways with centerline spacing less than 2,500 feet. This increment will expand the application of FAA Order 7110.308 beyond the locations and runway ends already approved.
Task Force: Increase Use of Staggered Approaches (12)

Wake Turbulence Mitigation for Arrivals-Procedures (WTMA-P) for Heavy/757 Aircraft
 This increment expands the use of procedural dependent staggered approach separation to allow Boeing 757 and heavy aircraft to lead this procedure.

Amend Independent and Dependent Runway Standards in Order 7110.65 (Including Blunder Model Analysis)
 This increment amends runway spacing standards to achieve increased access to parallel runways with centerline spacing less than 4,300 feet and implements this change at approved locations.
Task Force: Revise the Blunder Assumptions (13)

Implement SATNAV or ILS for Parallel Runway Operations
 This increment will enable policy, standards and procedures to allow use of Satellite Navigation (SATNAV) or Instrument Landing System (ILS) when conducting simultaneous independent and dependent instrument approaches, and implement this new capability at approved locations.
Task Force: Implement CSPO: SATNAV or ILS (37a)



2 OI 102140: WTMD: Wind-Based Wake Procedures (2011-2016)

WTMD

Enabler referenced in Appendix A:
Paired Approach Guidance and Alerting

3 OI 102141: Improved Parallel Runway Operations (2012-2018)

Additional 7110.308 Airports

WTMA-P for Heavy/757 Aircraft

Amend Independent and Dependent Runway Standards in Order 7110.65 (Including Blunder Model Analysis)

Implement SATNAV or ILS for Parallel Runway Operations



Selected Work Activities

Budget Line	Task Force	Activity	Description	OIs	FY 2010	FY 2011	FY 2012 – Mid-term
Collaborative Air Traffic Management		Flight and State Data Management, Concept Development for Integrated NAS Design and Procedure Planning	Develops a framework for integrated National Airspace Design and Procedures planning, enhancements to existing infrastructure to support impact assessments, and develops initial concept for best-equipped, best-served.	108209 102141		<ul style="list-style-type: none"> Initiate analysis of equipage and avionics capabilities required through the mid-term to support best-equipped, best-served 	<ul style="list-style-type: none"> Conduct feasibility assessment of simultaneous ILS, RNP AR descent Conduct research and analysis associated with the feasibility of the elimination of the requirement of 1,000 feet of altitude separation during simultaneous turn onto final approach
Flexible Terminal Environment		Separation Management, Wake Turbulence Mitigation for Arrivals (WTMA)	Evaluates WTMA feasibility prototype at a candidate airport. Concludes detailed benefit and safety assessments for the implementation of WTMA procedures.	102141 102144		<ul style="list-style-type: none"> Complete WTMA feasibility prototype evaluation using implementation on chosen simulated automation system 	<ul style="list-style-type: none"> Complete WTMA concept feasibility prototype evaluation in simulated candidate airport environments Complete analyses and documentation of WTMA requirements Evaluate wake mitigation technology solutions

Closely Spaced, Parallel, Converging and Intersecting Runway Operations (cont'd)

Selected Work Activities

Budget Line	Task Force	Activity	Description	OIs	FY 2010	FY 2011	FY 2012 – Mid-term
Flexible Terminal Environment		Separation Management, Wake Turbulence Mitigation for Departures (WTMD)	Performs safety risk management analysis, tests and evaluations of wake turbulence mitigation and departure procedures.	102141	✓ Completed prototype of WTMD demonstration system at William J. Hughes Technical Center	<ul style="list-style-type: none"> Deliver demonstration to first site, Houston (IAH) 	<ul style="list-style-type: none"> Complete regional service center engineering and installation of WTMD components in Memphis (MEM) and San Francisco (SFO) ATC towers Install data links necessary for WTMD operation at MEM and SFO At IAH, MEM and SFO continue providing: WTMD software adaptation, software maintenance, hardware maintenance (preventive and corrective) on any WTMD unique system components, and daily service certification
Flexible Terminal Environment	37a 13	Separation Management, Closely Spaced Parallel Runway Operations (CSPO)	Examines alternate proposals for further reductions of separation standards in runway spacing, and conducts simulator trials to collect data and conduct analysis.	102141	✓ Upgraded CSPO modeling and simulation tool with version 2 software enhancements	<ul style="list-style-type: none"> Complete first stage analyses to re-evaluate the blunder model for CSPO and determine the impact on reducing lateral runway separation standards 	<ul style="list-style-type: none"> Conduct further Human-in-the-Loop (HITL) tests to evaluate operational application for Dual ILS/RNAV/ Precision Runway Monitor (PRM)/Wake/Blunder/ADS-B Develop Safety Management System requirements for approaches at reduced separation standards in runway spacing Determine minimum spacing for simultaneous independent approaches Conduct demonstrations to validate concept and requirements and obtain buy-in from stakeholders Develop and coordinate Safety Risk Management Document (SRMD) for approaches at reduced separation standards for runway spacing Continue CSPO blunder model enhancements Continue HITL activities to support CSPO Continue to implement procedures for CSPO at additional airports

Performance Based Navigation



1 OI 108209: Increase Capacity and Efficiency Using RNAV and RNP

Area Navigation (RNAV) and Required Navigation Performance (RNP) can enable more efficient aircraft trajectories. RNAV and RNP, combined with airspace changes, increase airspace efficiency and capacity.

Task Force: Metroplex, Cruise and Overarching

Integrated Airspace and Procedures

Optimization of Performance Based Navigation (PBN) Procedures

Additional teams of stakeholders will be created to address short-term PBN procedures optimization.

Supported By: Aeronautical Common Service

Task Force: Optimize and Increase RNAV Procedures (32a and 29)

Large-Scale Redesign of Terminal and Transition Airspace Leveraging PBN

The Integrated Airspace and Procedures approach provides a geographic focus to problem solving, with a systems view of PBN initiatives, to the design of airspace.

Supported By: Aeronautical Common Service

Task Force: Integrate Procedure Design to Deconflict Airport, Implement RNP with RF Capability, and Expand Use of Terminal Separation Rules (4, 21a and 32b), Increase Capacity and Throughput for Converging and Intersecting Runways (9)

Transition to PBN Routing for Cruise Operations

This approach augments the conventional NAVAID-based Jet and Victor airways with RNAVs, including Q-routes and T-routes.

Supported By: Aeronautical Common Service

Task Force: Develop RNAV-Based En Route System (30)

Navigation System Infrastructure

NextGen En Route Distance Measuring Equipment (DME) Infrastructure

Additional DME coverage over the continental United States is needed to optimize and expand RNAV routes by closing coverage gaps at and above Flight Level 240.

Tools/Automation

Relative Position Indicator (RPI)

RPI is a tool that can assist both the controller and traffic management in managing the flow of traffic through a terminal area merge point.

Automated Terminal Proximity Alert (ATPA)

ATPA is an air traffic control (ATC) automation tool that provides situational awareness and alerts to controllers on color displays of Common Automated Radar Terminal System (CARTS) and on Standard Terminal Automation Replacement System (STARS) displays.

Task Force: Achieving Existing 3- and 5-Mile Separation Standards

FMC Route Offset

Automation provides controllers with support to amend an aircraft's flight plan to indicate that it has been placed on, or has been taken off, a Flight Management Computer (FMC) lateral offset.

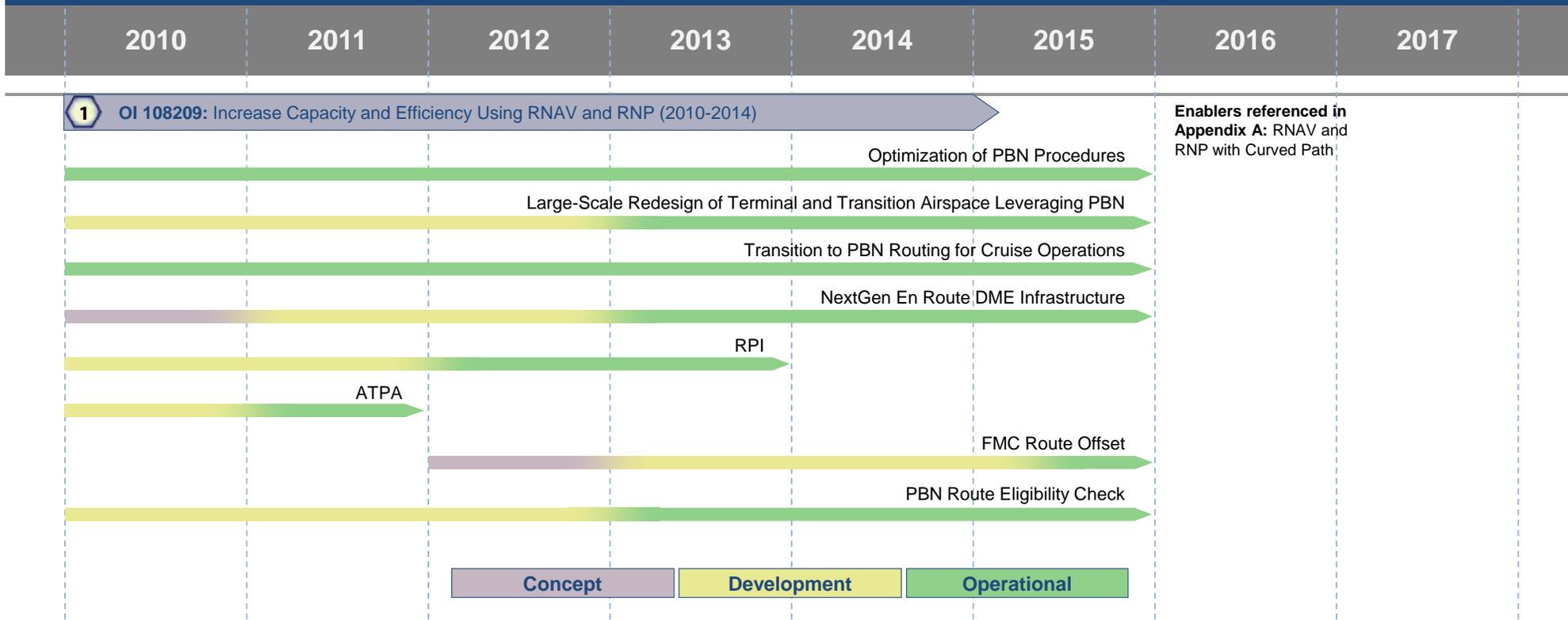
Supported By: Flight Common Service

PBN Route Eligibility Check

En Route Automation will check the eligibility of aircraft to operate on performance-restricted routes.

Supported By: Flight Common Service

Performance Based Navigation (cont'd)



Selected Work Activities

Budget Line	Task Force	Activity	Description	OIs	FY 2010	FY 2011	FY 2012 – Mid-term
Operations	4 21a 32b	New York/New Jersey/Philadelphia Metropolitan Area Airspace Redesign	Increases efficiency and reliability of the airspace structure and ATC to accommodate growth while enhancing safety, reducing delay and taking advantage of new technologies. This project encompasses a complete redesign of the airspace in the New York and Philadelphia metropolitan areas. It capitalizes on PBN, higher downwind segments for arrival aircraft, unrestricted departure climbs, fanned departure headings and holding in terminal airspace. The four implementation stages started in December 2007 and are planned through 2012.		<ul style="list-style-type: none"> ✓ Completed initial designs supporting Stage 2A implementation decision 	<ul style="list-style-type: none"> • Implement Stage 2A 	<ul style="list-style-type: none"> • Implement remaining stages • Complete airspace designs for remaining stages
Operations	4 21a 32b	Chicago Airspace Project	Encompasses significant increases in en route departure throughput with several new departure routes planned (east, west and south) and supports the O'Hare Modernization Project (OMP) with new arrival routes and airspace to capitalize on the new runways at O'Hare. The project also includes efficiencies for other airports in the Chicago area. The three implementation stages started in March 2007 and are planned through 2013.		<ul style="list-style-type: none"> ✓ Completed airspace design for Stage 3 High and Wide ✓ Completed environmental design review 	<ul style="list-style-type: none"> • Initiate ZAU airspace divestitures to Grissom Air Reserve Base to enable a 10-sector low altitude redesign which will improve efficiency and reduce complexity 	<ul style="list-style-type: none"> • Implement Stage 3 (coincident with OMP runway 10C/28C completion)

Budget Line	Task Force	Activity	Description	OIs	FY 2010	FY 2011	FY 2012 – Mid-term
Operations	4 21a 32b	Las Vegas Optimization Project	Provides near-term modification of airspace and procedures supporting the Las Vegas Valley. This effort is developing new PBN departure and arrival routes and realigning airspace to increase efficiency at McCarran International Airport and surrounding satellite airports. The implementation is planned to start in June 2011 and continue through 2013.		<ul style="list-style-type: none"> ✓ Developed RNAV procedures for Henderson Executive Airport scheduled to be published in 2011 ✓ Modified 2 existing DME to accommodate current DME operational requirement 	<ul style="list-style-type: none"> • Complete Las Vegas optimization environmental assessment • Complete Henderson procedure optimization 	<ul style="list-style-type: none"> • Implement Las Vegas procedure optimization
Operations	32a 29	Metroplex Optimization of Airspace and Procedures	Expedites versions of Integrated Airspace and Procedures projects, but with an expedited life cycle of two to three years from planning to implementation. The focus of these efforts is on implementation of optimized PBN arrivals and departures and airspace changes to support optimal routings. This concept is based on a two-team approach: study teams and design/implementation teams.		<ul style="list-style-type: none"> ✓ Simulated study team process to identify limitations and recommend modifications prior to deployment of actual study teams ✓ Initiated 2 prototype study teams in north Texas and Washington, D.C., metroplexes 	<ul style="list-style-type: none"> ✓ Selected next 5 sites for deployment of study teams. These sites are: Atlanta, Houston, Southern California, Northern California and Charlotte, N.C. • Initiate 2-3 design/implementation teams to provide a systematic, effective approach to the design, evaluation and implementation of PBN-optimized airspace and procedures 	<ul style="list-style-type: none"> • Continue design/implementation teams to provide a systematic, effective approach to the design, evaluation and implementation of PBN-optimized airspace and procedures
Operations	32a 29	PBN Procedures	Adds efficiency with new PBN procedures and optimizes existing initial capability PBN procedures. Most of the procedures have proponents from industry and/or ATC. These PBN procedures address location-specific safety issues and efficiencies.		<ul style="list-style-type: none"> ✓ Implemented a total of 200 PBN routes and procedures including 51 routes, 90 RNAV Standard Instrument Departures (SIDs) and Standard Terminal Arrival Routes (STARs), and 59 RNP Authorization Required approach procedures ✓ Developed initial PBN routes and procedures designs for integrated procedures and airspace project at Denver 	<ul style="list-style-type: none"> • Continue integrated design and implementation of the PBN procedures at Denver • Continue to implement PBN routes and procedures in the NAS 	<ul style="list-style-type: none"> • Continue to implement user requested PBN procedures
Operations	30	En Route PBN – Q-Routes	Continues development and implementation of PBN Q-routes as the national routing infrastructure.		<ul style="list-style-type: none"> ✓ Developed a draft Q-route implementation plan ✓ Initiated development of Q-routes 	<ul style="list-style-type: none"> • Finalize the Q-route implementation plan and initiate the implementation process 	<ul style="list-style-type: none"> • Continue the Q-route implementation plan

Selected Work Activities

Budget Line	Task Force	Activity	Description	OIs	FY 2010	FY 2011	FY 2012 – Mid-term
Operations		National Airspace and Procedures Plan	Represents the agreements and commitments of the FAA to modernize the airspace and procedures to solve problems in core areas. Also, it includes evolutionary activities such as concepts and demonstrations related to airspace and PBN.		✓ Published Version 1 as the baseline of the current NAS	<ul style="list-style-type: none"> Continue Airspace Management Program legacy projects Complete annual PBN procedure development goals; transition to benefits-based service goals Focus on optimal altitude procedures Use metroplex teams to drive optimization and decisions on Integrated Airspace and Procedures projects Execute multi-year plan for Q-route development and implementation 	<ul style="list-style-type: none"> Transition to Integrated Airspace and Procedures approach for airspace and PBN procedures efforts Use results of demonstration efforts and concept exploration experiments, which should be available to inform decisions about inclusion of future concepts (e.g., Integrated Arrival/Departure Operations and High Altitude Trajectory Based Airspace)
Trajectory Based Operations		Capacity Management - NextGen DME	Provides the necessary equipment enhancements, relocations, and replacements to ensure that DME facilities are available in accordance with the FAA's NextGen Implementation Plan.	108209		<ul style="list-style-type: none"> Award contract 	<ul style="list-style-type: none"> Develop recommendation on future program plans based on FY 2010-2011 deliverables and associated requirements to fill the gaps to enable Performance Based Navigation in the high altitude route structure Deploy NextGen DME
Flexible Terminal Environment	9	Separation Management, Enhancing Terminals and Airports - Terminal Enhancements for RNAV ATC	Performs analysis, systems engineering and support modifications and improvements to STARS and CARTS to support merging multiple RNAV routings in the terminal environment.	108209	✓ Developed demonstration/ Human-in-the-Loop (HITL) test plan	<ul style="list-style-type: none"> Develop Prototype demonstration/HITL consolidated report Conduct impact assessment – trade study for HITL 	
Trajectory Based Operations		Separation Management, Modern Procedures (Separation Automation Enhancements, Data-Side and Radar-Side)	Performs pre-implementation activities necessary to transition separation management automation enhancements for implementation and continued functionality for PBN route eligibility checking for inclusion in En Route Automation Modernization Release 3.	108209	✓ Delivered variable separation concept of operations	<ul style="list-style-type: none"> Continue development of PBN Conformance Monitor and Alert 	<ul style="list-style-type: none"> Develop, evaluate and validate improvements to the strategic conflict detection and prediction algorithms, the trajectory model, and the conflict alert algorithms Develop, evaluate and validate the requirements for flight data display enhancements to support elimination of flight strips in non-surveillance airspace Provide regulated access to specific aircraft using dynamic special activity airspace to promote fuller use of available airspace Complete prototype development for FMC Route Offset
Demonstration		RNAV/RNP Demonstration	Demonstrates the safe and effective integration of public RNP operations in a mixed-equipage traffic environment at a small/medium airport.			<ul style="list-style-type: none"> Initiate RNAV/RNP terminal area demonstration at a small/medium airport 	<ul style="list-style-type: none"> Conduct demonstrations and operational trials on technologies, supporting safety logic, air traffic management and aircraft performance to identify any uncertainty or deficiency (risks) to performance and/or to validate the integration and/or implementation of NextGen technologies, applications, procedures and/or standards

Time Based Flow Management



1 OI 104115: Current Tactical Management of Flow in the En Route for Arrivals/Departures

Proper spacing and sequencing of air traffic maximizes National Airspace System (NAS) efficiency and capacity in the arrival and departure phases of flight.

Task Force: Cruise

Implement Traffic Management Advisor's (TMA) Adjacent Center Metering (ACM) Capability at Additional Locations

To expand the benefits of time-based metering and Time Based Flow Management's (TBFM) other advanced flow management capabilities, ACM will be implemented at the following additional locations: LAX — ACM from ZAB and ZLA; SFO — ACM from ZSE, ZOA, ZLA and ZLC; SAN — ACM from ZLA and ZOA; ATL — ACM from ZDC and ZHU; and IAD — ACM from ZNY.

Supported By: Weather and Flight Common Services

Task Force: Expand Use of Time-Based Metering (24)

Implement TMA at Additional Airports

To expand the benefits of time-based metering and TBFM's other advanced flow management capabilities, TBFM will be implemented at the following additional locations: Baltimore, Md. (BWI); Cleveland, Ohio (CLE); Washington, D.C. (DCA); San Diego, Calif. (SAN); Morristown, N.J. (MMU); Teterboro, N.J. (TEB).

Supported By: Weather and Flight Common Services

Task Force: Expand Use of Time-Based Metering (24)

2 OI 104123: Time-Based Metering Using RNAV and RNP Route Assignments

Area Navigation (RNAV), Required Navigation Performance (RNP) and Time-Based Metering (TBM) provide efficient use of runways and airspace in high-density airport environments. Metering automation will manage the flow of aircraft to meter fixes, thus permitting efficient use of runways and airspace.

Use RNAV Route Data to Calculate Trajectories Used to Conduct TBM Operations

The Terminal Radar Approach Control (TRACON) RNAV routes for both Standard Instrument Departures (SIDs) and Standard Terminal Arrival Routes (STARs) will be used to calculate the terminal component of aircraft trajectories.

Supported By: Aeronautical Common Service

3 OI 104120: Point-in-Space Metering

Air Navigation Service Provider (ANSP) uses scheduling tools and trajectory-based operations to assure smooth flow of traffic and increase the efficient use of airspace.

Extended Metering

Will provide flow deconfliction for metered aircraft at the meter reference points (upstream from the meter fixes).

Supported By: Weather and Flight Common Services

4 OI 104117: Improved Arrival, Surface, Departure, Flow Operations

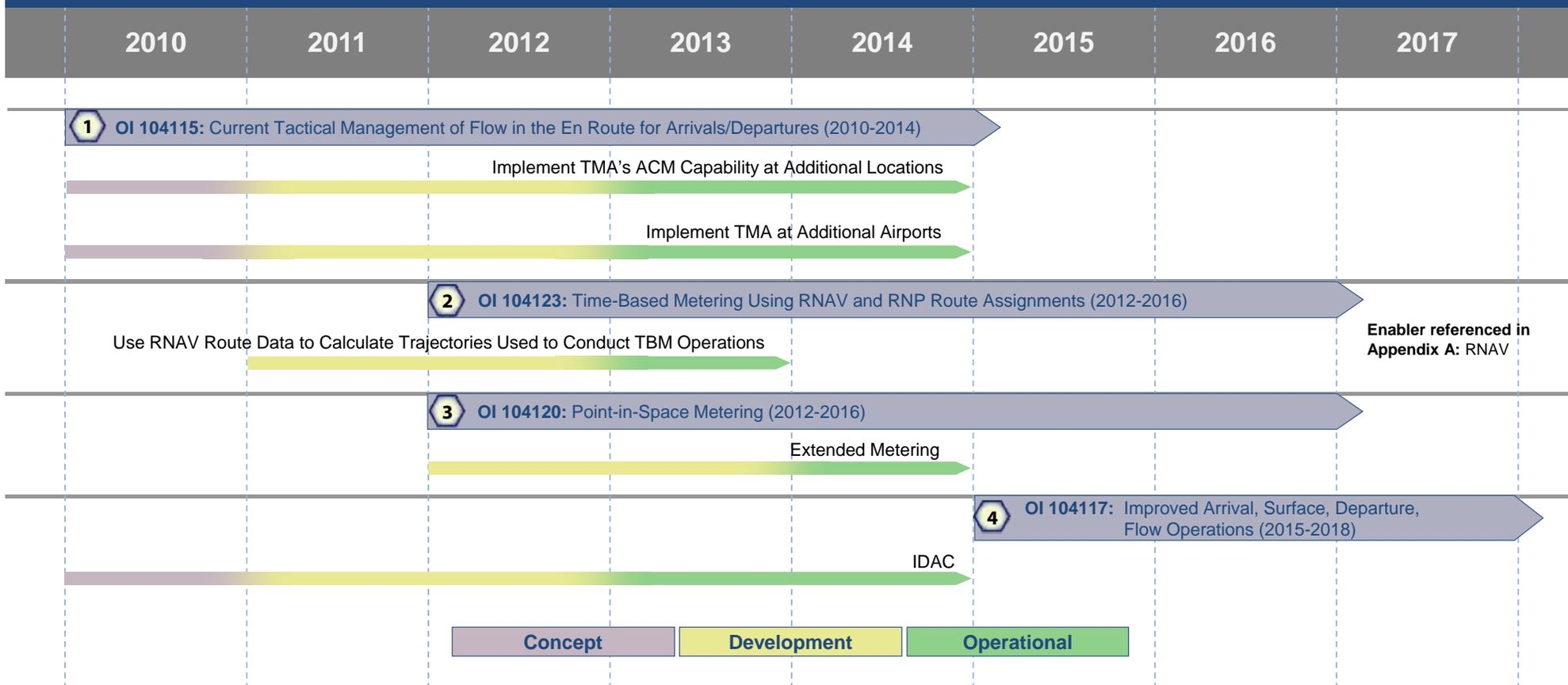
This integrates advanced arrival/departure flow management with advanced surface operation functions to improve overall airport capacity and efficiency.

Integrated Departure/Arrival Capability (IDAC)

Increases NAS efficiency and reduces delays by providing decision-making support capabilities for departure flows. IDAC automates the process of monitoring departure demand and identifying departure slots for tower personnel.

Supported By: Weather and Flight Common Services

Time Based Flow Management (cont'd)



Selected Work Activities

Budget Line	Task Force	Activity	Description	OIs	FY 2010	FY 2011	FY 2012 – Mid-term
Trajectory Based Operations		Trajectory Management, En Route (Point-in-Space Metering)	Supports the FAA Air Traffic Organization mission by increasing the efficiency of the air traffic operations and reducing users' delays through the use of TBM.	104120	<ul style="list-style-type: none"> ✓ Completed TBFM concept of operations ✓ Developed coupled scheduling design and requirements documentation 		
Arrivals/Departures at High Density Airports	7b 8 46 24	Trajectory Management – Arrival Tactical Flow (TBO – En Route Point-in-Space Metering)	Provides a consistent flow of traffic to the runway using TBM. TMA/TBFM is an Air Route Traffic Control Center (ARTCC)-based decision-support tool designed to optimize the flow of aircraft into capacity constrained areas.	104115	<ul style="list-style-type: none"> ✓ Developed TBFM business case documentation (shortfall analysis, concept of use, cost Rough Orders of Magnitude, projected benefits, architecture artifacts, implementation strategy) and program baseline approval ✓ Developed TBFM training requirements 		

Budget Line	Task Force	Activity	Description	OIs	FY 2010	FY 2011	FY 2012 – Mid-term
Time Based Flow Management		Time Based Flow Management (TBFM)	Provides a consistent flow of traffic to the runway using TBM. TMA/TBFM is an ARTCC-based decision-support tool designed to optimize the flow of aircraft into capacity constrained areas.	104115		<ul style="list-style-type: none"> Develop, test and deploy coupled scheduling capability, incorporating deconflicted metering points in ARTCC airspace and enabling the subsequent extended metering capability Initiate site survey and adaptation activities to implement ACM at additional locations and TMA at additional airports Initiate development of detailed requirements analysis for the IDAC 	<ul style="list-style-type: none"> Develop, test and deploy extended metering, IDAC and the capability to apply RNAV routes to calculate trajectories Deploy ACM and the TMA capabilities to additional locations in the NAS
Flexible Terminal Environment	43 38 9 41	Flight and State Data Management, Surface/Tower/Terminal Systems Engineering	Redefines and extends the Tower Flight Data Manager (TFDM) and Arrival/Departure Management Tool (A/DMT) concept of operations. Funding will be used to update current analysis proposals and assess acquisition risks.	104117	✓ Completed TFDM Investment Analysis Readiness Decision	<ul style="list-style-type: none"> Conduct TFDM evaluations and demonstrations Conduct Human-in-the-Loop tests to finalize TFDM concept of use 	<ul style="list-style-type: none"> Develop concept of operations for TFDM Phase 2 Develop operation evaluation model Develop TFDM Phase 2 prototype Conduct demonstrations of TFDM Phase 2
Collaborative Air Traffic Management	35	Flight and State Data Management, Common Status and Structure Data	Addresses information and capability gaps within aeronautical information to achieve NextGen shared situational awareness.	104117	✓ Developed concept of operations and Enterprise Architecture for a national Special Activity Airspace	<ul style="list-style-type: none"> Deliver digital airport structure and configuration information to support situational awareness 	<ul style="list-style-type: none"> Develop concepts for common adaptation to support base information for TBFM activities Initiate limited deployment of standards-based common adaptation to NAS
Demonstrations		Demonstrations and Infrastructure Development	Tests and demonstrates emerging technologies as they are developed to allow the FAA to meet the NextGen mid-term goals and objectives.		✓ Conducted 2D Aircraft Flight Trial in Denver		

Collaborative Air Traffic Management



1 OI 105302: Continuous Flight Day Evaluations

Continuous (real-time) constraints are provided to Air Navigation Service Provider (ANSP) traffic management decision-support tools and the National Airspace System (NAS) users.

Enhanced Congestion Prediction

The Enhanced Congestion Prediction increment provides improved capabilities to assess the impact of a set of reroutes on the level of demand and other performance metrics for a point of interest.

Supported By: Aeronautical and Weather Common Services

Automated Congestion Resolution

The Automated Congestion Resolution increment recommends reroutes for flight-specific Traffic Management Initiatives (TMIs). This allows the traffic manager to adjust the target parameters and evaluate the required trajectory adjustments.

Supported By: Aeronautical and Weather Common Services

2 OI 101102: Provide Full Flight Plan Constraint Evaluation

Constraint information that impacts the proposed route of flight is incorporated into ANSP automation, and is available to users.

Task Force: Integrated Air Traffic Management

Electronic Negotiations

The Electronic Negotiations increment provides flight planners with information about congestion along their intended routes and proposes flight-specific rerouting.

Supported By: Weather Common Service

Task Force: Integrated System-Wide Approach (CDM/TFM/ATC) (47) and Improve CATM Automation to Negotiate User-Preferred and Alternative Trajectories (7b, 8 and 46)

3 OI 105208: TMIs with Flight-Specific Trajectories

This capability will increase the agility of the NAS to adjust and respond to dynamically changing conditions such as impacting weather, congestion and system outages.

Task Force: Integrated Air Traffic Management and Data Comm

Basic Rerouting Capability

This capability is the means by which Traffic Flow Management System (TFMS)-generated reroutes are defined and transmitted via System Wide Information Management (SWIM).

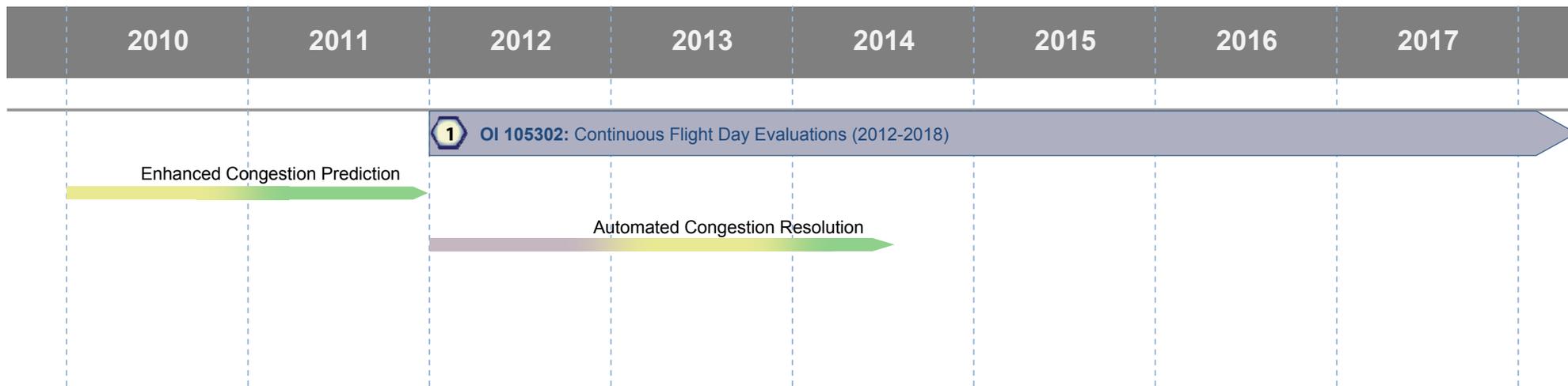
Supported By: Flight and Weather Common Services

Delivery of Pre-Departure Reroutes to Controllers

This increment will give En Route Automation Modernization (ERAM) additional capabilities to receive amended routes pre-departure and provide updated flight data to the tower.

Supported By: Flight Common Service

Task Force: Improve CATM Automation to Negotiate User-Preferred Routes and Alternate Trajectories (7b, 8 and 46) and Digital Air Traffic Control Communications for Revised Departure Clearances, Reroutes and Routine Communications (39)



2 OI 101102: Provide Full Flight Plan Constraint Evaluation (2013-2018)

Electronic Negotiations

3 OI 105208: TMIs with Flight- Specific Trajectories (2014-2015)

Basic Rerouting Capability

Delivery of Pre-Departure Reroutes to Controllers

Concept

Development

Operational

Selected Work Activities

Budget Line	Task Force	Activity	Description	OIs	FY 2010	FY 2011	FY 2012 – Mid-term
Collaborative Air Traffic Management	7b 8 46	Flow Control Management, Strategic Flow Management Integration (Integration Execution of Flow Strategies into Controller Tools)	Refines active aircraft reroutes concepts; develops active aircraft reroute requirements; analyzes, simulates and develops white papers on active aircraft reroutes.	105208	✓ Developed concept of operations for airborne reroutes, altitude modification, etc.	<ul style="list-style-type: none"> Conduct analysis for airborne reroute requirements 	<ul style="list-style-type: none"> Conduct risk reduction analysis and integration engineering products for strategic flow use of airborne reroutes in support of integrated arrival/departure management Implement pre-departure reroutes in ERAM with no automated coordination with Terminal and simulations of airborne reroute procedures
Collaborative Air Traffic Management	47	Flow Control Management, Strategic Flow Management Enhancement (Enhancing the Strategic Flow Program)	Refines concept of operations for strategic flow management, analysis and white paper of strategic flow management, and modeling and simulation.	105208 101102	✓ Developed initial Traffic Flow Management (TFM) concept of operations document	<ul style="list-style-type: none"> Initiate demand and capacity balancing demonstration Deliver report that evaluates the business logic for balancing capacity and demand predictions 	<ul style="list-style-type: none"> Develop more efficient and tailored combinations of traffic management initiatives for strategic flow management through concept engineering, including prototypes traffic analysis tools and Human-in-the-Loop (HITL) simulations
Collaborative Air Traffic Management	47	Flight and State Data Management, Common Status and Structure Data	Addresses information and capability gaps within aeronautical information to achieve NextGen shared situational awareness and Trajectory Based Operations vision.	105302 105208	✓ Developed concept of operations and Enterprise Architecture for a National Special Activity Airspace	<ul style="list-style-type: none"> Deliver digital airport structure and configuration information to support situational awareness 	<ul style="list-style-type: none"> Develop concepts for common adaptation to support base information for CATM activities Begin limited deployment of standards-based common adaptation to NAS

Selected Work Activities

Budget Line	Task Force	Activity	Description	OIs	FY 2010	FY 2011	FY 2012 – Mid-term
Collaborative Air Traffic Management		Flight and State Data Management, Advanced Methods	Integrates weather into air traffic management (ATM); probabilistic TFM Area Flow Program will develop advanced algorithms to support the area flow support tool. Creates a unified flight planning filing by continuing assessment of fuzzy performance and common reference to the ATM domain.	105302 105208 101102	<ul style="list-style-type: none"> ✓ Developed requirement recommendations for integrated weather in ATM 	<ul style="list-style-type: none"> • Apply industry standards exchange formats for inclusion in decision-support tools 	<ul style="list-style-type: none"> • Complete prototypes, concepts of use and demonstrate unified flight planning and filing making use of constraint management through a hypercube and supporting probabilistic TFM models with integrated weather
Collaborative Air Traffic Management		Flight and State Data Management, Flight Object	Facilitates the sharing of common flight information between systems and enables collaboration using common reference framework. The Flight Object is an extensible and dynamic collection of data elements that describes an individual flight throughout its life cycle. It is the single common reference for all system information about that flight. It associates and merges disparate data into a cohesive picture of the flight. Authorized system stakeholders and the ANSP may electronically access consistent flight data that is tailored to their specific need and use. A Flight Object is created for each proposed flight. The Flight Object description does not include environment or weather information since these are system-wide elements which affect multiple flights.	101102	<ul style="list-style-type: none"> ✓ Hosted the Flight Object Industry Day ✓ Completed development of an initial Flight Object Data Dictionary 	<ul style="list-style-type: none"> • Deliver the Flight Object global flight identifier report • Deliver the high-level Flight Object benefit approach report 	<ul style="list-style-type: none"> • Continue to develop Flight Object Data Dictionary • Continue to model Flight Object data • Host joint Flight Object and aeronautical information Industry Days • Conduct international demonstration of Flight Object with Asia Pacific partners
System Development		ATM Requirements, Airborne System Wide Information Management (SWIM)	Develops concepts and requirements for an airborne exchange of NAS information via the SWIM network for flight, aeronautical and weather information between aircraft and ground-based FAA systems.	105302	<ul style="list-style-type: none"> ✓ Developed and delivered initial airborne SWIM concept of use ✓ Developed white paper identifying technical impacts to SWIM portals 	<ul style="list-style-type: none"> • Conduct airborne access to SWIM concept of use v2 (Industry Review) • Conduct airborne access to SWIM Operational and Technical Requirements Industry Day 	<ul style="list-style-type: none"> • Conduct airborne access to SWIM laboratory simulations • Conduct airborne access to SWIM Initial Verification and Validation

Budget Line	Task Force	Activity	Description	OIs	FY 2010	FY 2011	FY 2012 – Mid-term
Collaborative Air Traffic Management		Dynamic Airspace and Capacity Management	Provides the tools to air traffic managers to reconfigure airspace, expand or contract control sectors to match the overall level of activity in the facility's airspace, and to dynamically deactivate restrictions. The Airspace Resource Management System (ARMS) will provide the tools for controlling the reconfiguration of the NextGen networked communications infrastructure in response to an operational requirement for reconfigurable airspace.		✓ Developed multi-year program plan	<ul style="list-style-type: none"> • Develop preliminary ARMS concept of operation document • Deliver white paper on ARMS functional description 	<ul style="list-style-type: none"> • Develop ARMS evaluation model • Conduct demonstration of ARMS prototype
System Development		ATC/Technical Operations Human Factors, Controller Efficiency/Air Ground Integration	Centers on the human element in the transformation of the NAS leading to the achievement of the NextGen vision.	101102	✓ Developed initial air/ground integration simulation roadmap	<ul style="list-style-type: none"> • Develop NextGen common workstation demo display simulation 	<ul style="list-style-type: none"> • Demonstrate Collaborative Air Traffic Management efficiencies enabled by common situational awareness between flight operators and controllers

Automation Support for Separation Management

1 2

Flight Planning

Pushback / Taxi

/ Takeoff

Domestic / Oceanic Cruise

Descent

/ Final Approach

Landing / Taxi

Phases of Flight

1 OI 102108: Oceanic In-Trail Climb and Descent

Air Navigation Service Provider (ANSP) automation enhancements will take advantage of improved communication, navigation and surveillance coverage in the Oceanic domain. When authorized by the controller, pilots of equipped aircraft use established procedures for climbs and descents.

Automatic Dependent Surveillance-Contract (ADS-C) Oceanic Climb/Descent Procedure (CDP)

The ADS-C CDP (previously known as ADS-C In-Trail Procedure (ITP)) is a new concept that allows a properly equipped aircraft (e.g., Future Air Navigation System (FANS) 1/A equipage) to climb or descend through the altitude of another properly equipped aircraft with a reduced longitudinal separation distance (compared with the required longitudinal separation minima for same-track, same-altitude aircraft). This procedure allows more aircraft to reach their preferred altitude.

ADS-C Automation for Oceanic CDP

The automation enhancements to Ocean21 include capabilities to allow a controller to select two aircraft and ensure they are eligible for ADS-C CDP, send concurrent on-demand position reports to two aircraft, determine if the minimum separation distance between the two aircraft is greater than the ADS-C CDP separation distance (e.g., greater than 15 nautical miles (nm)), display the ADS-C CDP conflict probe results to a controller, and build an uplink clearance message to the ADS-C CDP requesting aircraft and an uplink traffic advisory message to the blocking aircraft.

Automatic Dependent Surveillance-Broadcast (ADS-B) Oceanic ITP and Automation

The ADS-B ITP will enable aircraft equipped with ADS-B and appropriate onboard automation to climb and descend through altitudes where current non-ADS-B separation standards would prevent desired altitude changes.

Supported By: Surveillance Common Service

2 OI 102137: Automation Support for Separation Management

ANSP automation provides the controller with tools to manage aircraft in a mixed navigation and wake performance environment.

Aircraft-to-Aircraft Alerts for 3-nm Separation Areas

En route conflict alert will be enhanced to support wake vortex separation requirements in 3-nm separation areas and transition airspace. Problem detection and trial planning capabilities will also be enhanced to support aircraft-to-aircraft alerts in 3-nm separation areas and transition airspace, to include alerts based on wake vortex separation requirements.

Wake Vortex Separation Indicator

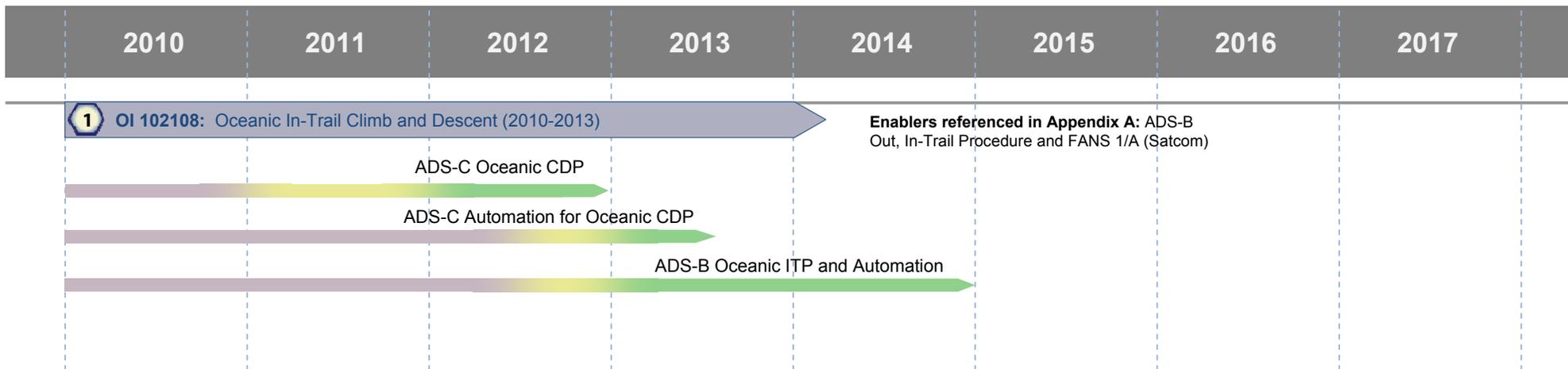
To support the en route controller in applying wake turbulence separation standards, the radar display will indicate static wake vortex separation requirements for any given pair of aircraft.

Assisted Trial Planning Onto the Radar and Data Consoles

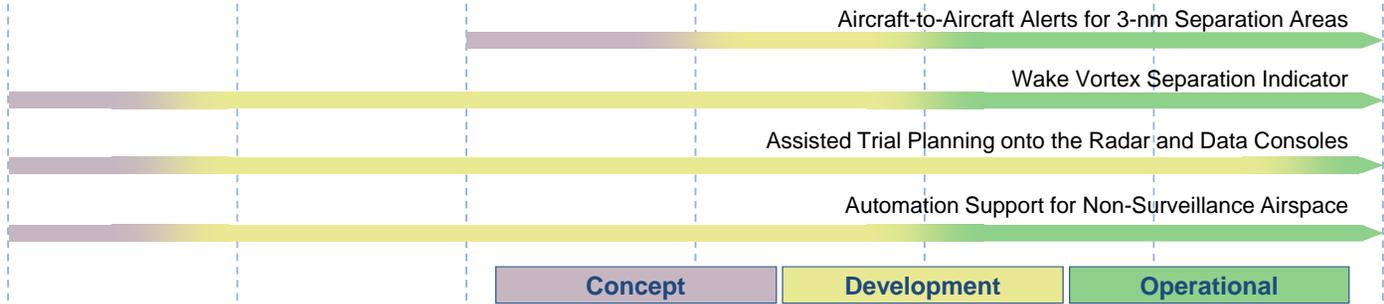
Assisted Trial Planning will be integrated on the en route radar and the data consoles. Integrating this capability into the consoles assists radar controllers in determining possible problem-free flight plan changes without having to use the data consoles to create trial plans. A controller will also be able to use this capability to simultaneously examine the problem status of a set of possible clearances.

Automation Support for Non-Surveillance Airspace

The en route Automation will provide an indication of possible non-surveillance separation violations using a base set of non-surveillance separation rules. This capability will also utilize electronic flight data, eliminating the need for paper flight strips.



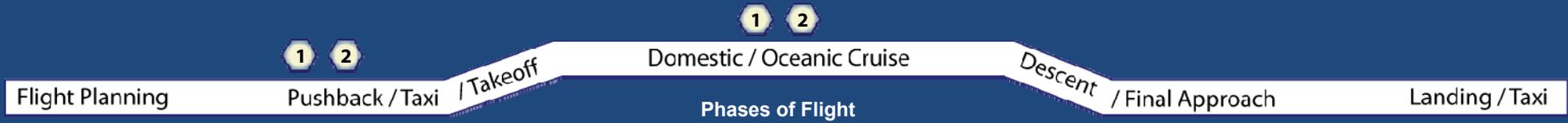
2 OI 102137: Automation Support for Separation Management (2014-2015)



Selected Work Activities

Budget Line	Task Force	Activity	Description	OIs	FY 2010	FY 2011	FY 2012 – Mid-term
Trajectory Based Operations		Oceanic Tactical Trajectory Management	Addresses current performance gaps in the areas of capacity, productivity, efficiency, safety and environmental impacts in oceanic environment.	102108	✓ Delivered concept of operations for In-Flight Operations Re-Profile Alert capability	<ul style="list-style-type: none"> Initiate planning for 2012 operational trials 	<ul style="list-style-type: none"> Complete functional requirements for ADS-C climb and descent procedure Complete preliminary requirements for pre-departure and Web-enabled Collaborative Trajectory Planning (CTP) Conduct lab demonstration for pre-departure CTP Initiate operational trial for Trajectory Feedback In-Flight Operations
Demonstration		International Air Traffic Interoperability	Contributes directly to NextGen concepts and supports international collaboration and harmonization, thus assisting the FAA and international communities to validate 4D Trajectory Based Operations alternatives (AIRE/ASPIRE).		✓ Conducted joint gate-to-gate demonstration with Single European Sky Air Traffic Management Research (SESAR)	<ul style="list-style-type: none"> Conduct trans-oceanic optimization demonstrations 	<ul style="list-style-type: none"> Conduct trans-oceanic optimization demonstrations Deliver trans-oceanic demonstration report Deliver trans-oceanic demonstration metrics report Collaborate internationally
Trajectory Based Operations		Separation Management, Modern Procedures (Separation Automation Enhancements, Data-Side and Radar-Side), Vertical Separation	Develops a separation management concept of operations. Develops initial automation requirement to assist in separation of aircraft in traditional traffic situations.	102137	✓ Delivered separation management concept of operations	<ul style="list-style-type: none"> Initiate pre-implementation prototype development for Wake Vortex Separation and extend 3-nm separation 	<ul style="list-style-type: none"> Develop, evaluate and validate improvements to the strategic conflict detection and prediction algorithms, the trajectory model, and the conflict alert algorithms Develop, evaluate and validate the requirements for flight data display enhancements to support elimination of flight strips in non-surveillance airspace Dynamic special activity airspace to promote the fuller use of available airspace by providing regulated access to specific aircraft

On-Demand NAS Information



1 OI 108212: Improved Management of Airspace for Special Use

Changes to status of airspace for special use are readily available for operators and Air Navigation Service Providers (ANSPs). The status changes are transmitted to the flight deck via voice or Data Communications. Flight trajectory planning is managed dynamically based on real-time use of air-space.

ANSP Real-Time Status for Special Use Airspace (SUA)

Airspace use is optimized and managed in real time, based on actual flight profiles and real-time operational use parameters. Airspace reservations for military operations, unmanned aircraft systems flights, space flight re-entry and restricted or warning areas are managed on as-needed basis.

Supported By: Aeronautical Common Service

Special Activity Airspace (SAA) Forecast of Capacity Constraints

This increment translates the SUA activation schedule and knowledge of the airspace configurations into predicted traffic flow constraints.

Supported By: Aeronautical Common Service

2 OI 103305: On-Demand NAS Information

NAS and aeronautical information will be available to users on demand. NAS and aeronautical information is consistent across applications and locations, and available to authorized subscribers and equipped aircraft. Proprietary and security-sensitive information is not shared with unauthorized agencies/individuals.

Broadcast Flight and Status Data to Pilots/Airline Operations Centers (AOCs)

This increment provides nationwide service coverage to deliver Traffic Information Services-Broadcast (TIS-B) for both Universal Access Transceiver (UAT) and 1090 MHz Mode S Extended Squitter (1090 ES).

Supported By: Surveillance and Weather Common Services

Provide Improved Flight Planning and In-Flight Advisories for Flight Operations Centers (FOCs)/AOCs

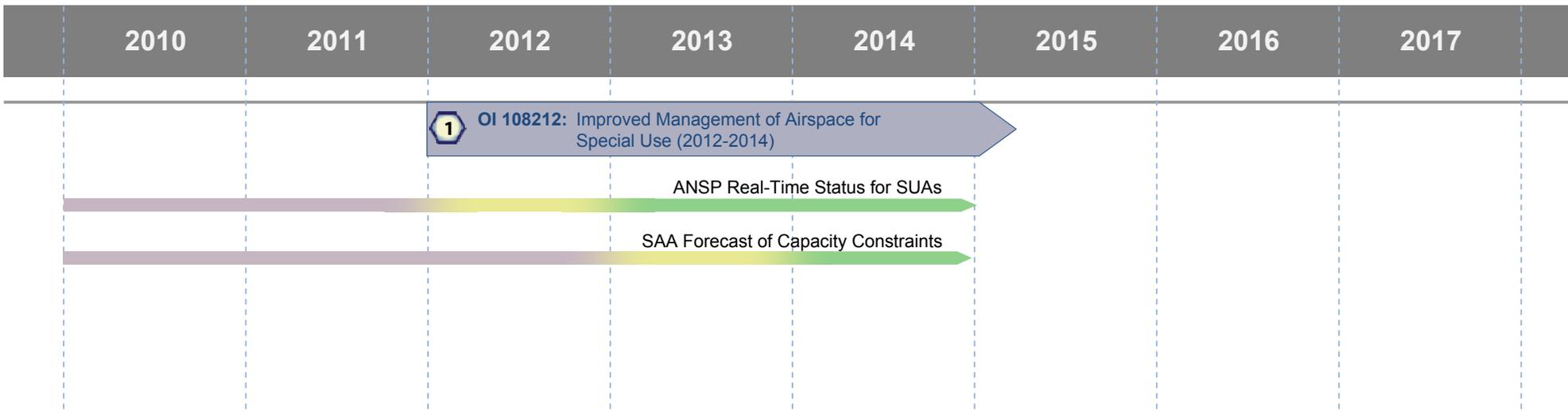
This increment ensures that NAS and aeronautical information is consistent, allowing users to subscribe to and receive the most current information from a single source. Information is collected from ground systems and airborne users (via ground support services), aggregated and provided through system-wide information environment, Data Communications, or other means.

Supported By: Aeronautical and Weather Common Services

Provide NAS Status via Digital Notices to Airmen (NOTAMs)

This increment enables the issuance of Digital NOTAMs for those airspace constraints affecting a flight based on its trajectory. The initial implementation includes internal distribution within ANSP of those notices that would be distributed via the Flight Information Services-Broadcast (FIS-B) service.

Supported By: Aeronautical Common Service



Enabler referenced in Appendix A: FIS-B

2 OI 103305: On-Demand NAS Information (2013-2018)

Broadcast Flight and Status Data to Pilots/AOCs

Provide Improved Flights Planning and In-Flight Advisories for FOCs/AOCs

Provide NAS Status via Digital NOTAMS

Concept

Development

Operational

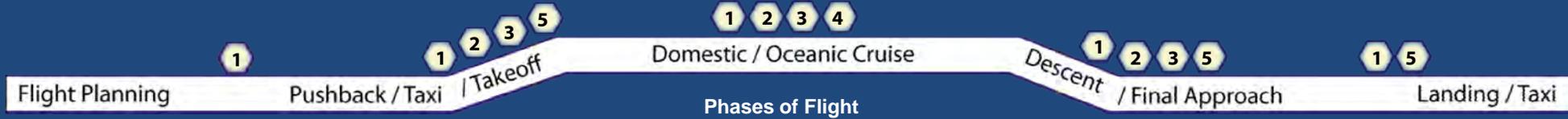
Selected Work Activities

Budget Line	Task Force	Activity	Description	OIs	FY 2010	FY 2011	FY 2012 – Mid-term
Collaborative Air Traffic Management	35	Flight and State Data Management, Common Status and Structure Data	Addresses information and capability gaps within aeronautical information to achieve NextGen shared situational awareness.	103305 108212	✓ Conducted concept of operations and Enterprise Architecture for a National SAA	<ul style="list-style-type: none"> Deliver digital airport structure and configuration information to support situational awareness 	<ul style="list-style-type: none"> Develop concepts for common adaption to support base information for On-Demand NAS activities Limited deployment of standards-based common adaptation to NAS
Demonstration		Joint Network Enabled Operations (NEO) Program (Spiral 3)	Develops information exchange protocol and architecture with interagency aviation stakeholders, and conducts flight operational trials as needed.	108212		<ul style="list-style-type: none"> Conduct initial program plan for data exchange demonstration combining net-centric capabilities and applications with Unmanned Aircraft Systems (UAS) 	<ul style="list-style-type: none"> Initiate concept of operations or concept of use for applying net-centric concepts to UAS Initiate the development of a concept of operations describing NEO operations in UAS environment Initiate safety and hazard analysis Initiate demonstration strategies Conduct demonstration to illustrate NEO capabilities operating in UAS environment

Selected Work Activities

Budget Line	Task Force	Activity	Description	OIs	FY 2010	FY 2011	FY 2012 – Mid-term
System Development		New Air Traffic Management (ATM) Requirements, Airborne System Wide Information Management (SWIM)	Develops concepts and requirements for an airborne exchange of NAS information via the SWIM network for flight, aeronautical and weather information between aircraft and ground-based FAA systems.	103305 108212	<ul style="list-style-type: none"> ✓ Developed and delivered initial airborne SWIM concept of use ✓ Developed white paper identifying technical impacts to SWIM portals 	<ul style="list-style-type: none"> • Conduct airborne access to SWIM concept of use v2 (industry review) • Conduct airborne access to SWIM Operational and Technical Requirements Industry Day 	<ul style="list-style-type: none"> • Conduct airborne access to SWIM laboratory simulations • Conduct airborne access to SWIM initial verification and validation
Collaborative Air Traffic Management		Flight and State Data Management, Flight Object	Facilitates the sharing of common flight information between systems and enables collaboration using common reference framework. The Flight Object is an extensible and dynamic collection of data elements that describes an individual flight throughout its life cycle. It is the single common reference for all system information about that flight. It associates and merges disparate data into a cohesive picture of the flight. Authorized system stakeholders and the ANSP may electronically access consistent flight data that is tailored to their specific need and use. A Flight Object is created for each proposed flight. The Flight Object description does not include environment or weather information since these are system-wide elements which affect multiple flights.	103305	<ul style="list-style-type: none"> ✓ Hosted the Flight Object Industry Day ✓ Completed development of an initial Flight Object Data Dictionary 	<ul style="list-style-type: none"> • Deliver the Flight Object global flight identifier report • Deliver the high-level Flight Object benefit approach report. 	<ul style="list-style-type: none"> • Continue to develop Flight Object Data Dictionary • Continue to model Flight Object data • Host joint Flight Object and aeronautical information industry days • Conduct international demonstration of Flight Object with Asia Pacific partners

Environment and Energy



1 OI 109309: Implement EMS Framework

Enable the use of the Environmental Management System (EMS) framework, including environmental goals and decision support tools, to address, plan and mitigate environmental issues.

Environmental Policy

This increment will refine and formalize NextGen environmental and energy policy including NextGen environmental goals.

Environmental Targets

This increment will explore, test and refine quantitative NextGen environmental targets for noise, air quality, climate, energy and water quality.

National Environmental Policy Act (NEPA) Strategy and Processes

This increment establishes effective strategic approaches for addressing the NEPA requirements of NextGen improvements.

Decision Support Assessment

This increment addresses mission-level NextGen decision support capabilities (e.g., capabilities that support FAA planning decisions such as those related to capacity management) and operational-level capabilities (e.g., those related to flow contingency management and trajectory flow).

Improved Scientific Knowledge

This increment will improve knowledge of aircraft source-level noise and emissions of air pollutants and greenhouse gases, their atmospheric evolution, and impacts on human health and welfare and climate change.

Analysis to Support International Environmental Standard-Setting

Analysis and benefit assessment will be performed to support the development and implementation of International Civil Aviation Organization environmental standards, such as for aircraft carbon dioxide emissions and more stringent noise levels.

Aviation Environmental Portfolio Management Tool - Economics

Capabilities of the aviation environmental portfolio management tool will be enhanced continuously through 2015 to enable analysis of airline and aviation market responses to environmental mitigation and policy options, and for analyzing U.S. environmental issues critical to NextGen under various fleet growth and evolution scenarios.

Aviation Environmental Design Tool (AEDT) – Regional

AEDT will provide capabilities for integrated environmental analysis at regional levels for fuel burn, emissions and noise.

Environmental Goals and Targets Performance Tracking System

A system will be established that will support the systematic identification of environmental benefits across the National Airspace System (NAS), enabling the FAA to measure progress toward achieving NextGen environmental goals. This system may include business practices, automation capabilities and interfaces with other automation systems.

NextGen EMS Frameworks and Stakeholder Collaboration

Standardized approaches will be identified for aviation stakeholders (e.g., manufacturers, airports, airlines and the FAA) to identify and address key environmental issues critical to stakeholder environmental programs or EMSs. These approaches are intended to allow aviation stakeholders to collaborate and address cross-cutting environmental challenges.

AEDT – Airport

AEDT will provide capabilities for integrated environmental analysis at airport levels for fuel burn, emissions and noise.

2 OI 109315: Implement NextGen Environmental Engine and Aircraft Technologies

Reductions in aircraft noise, emissions, and fuel burn through improvements in aircraft engine and airframe technologies and alternative fuels. Technologies will be at sufficient readiness level to achieve the goals of the FAA's Continuous Lower Energy, Emissions and Noise (CLEEN) program.

Open Rotor

Twin Annular Premixing Swirler II Lean Combustor

Adaptive Trailing Edges

Ceramic Matrix Composite Turbine Blade Tracks

Ceramic Matrix Composite Acoustic Nozzle

Engine Weight Reduction and High-Temperature Impeller

Dual-Wall Turbine Blade

Flight Management System (FMS) - Air Traffic Management (ATM) Integration

Ultra High-Bypass Ratio Geared Turbo Fan

3 OI 109316: Increased Use of Alternative Aviation Fuels

Determine the feasibility and market viability of alternative aviation fuels for civilian aviation use. Obtain ASTM certification of hydrotreated renewable jet (HRJ) fuels from fossil and renewable resources that are compatible with existing infrastructure and fleet thus meeting requirement to be a “drop-in” alternative fuel.

Drop-In HRJ Blend Fuels

This increment will result in ASTM approval in 2011 of a 50-50 blend of HRJ and Jet-A alternative fuels. This increment also explores other blends for environmental and performance feasibility through air quality and life-cycle emissions analyses, engine performance evaluation, and ground tests and flight demonstrations by 2013. These efforts will advance deployment of these sustainable alternative fuels, including environmental acceptability and ASTM approval.

Other Advanced Aviation Alternative Fuels

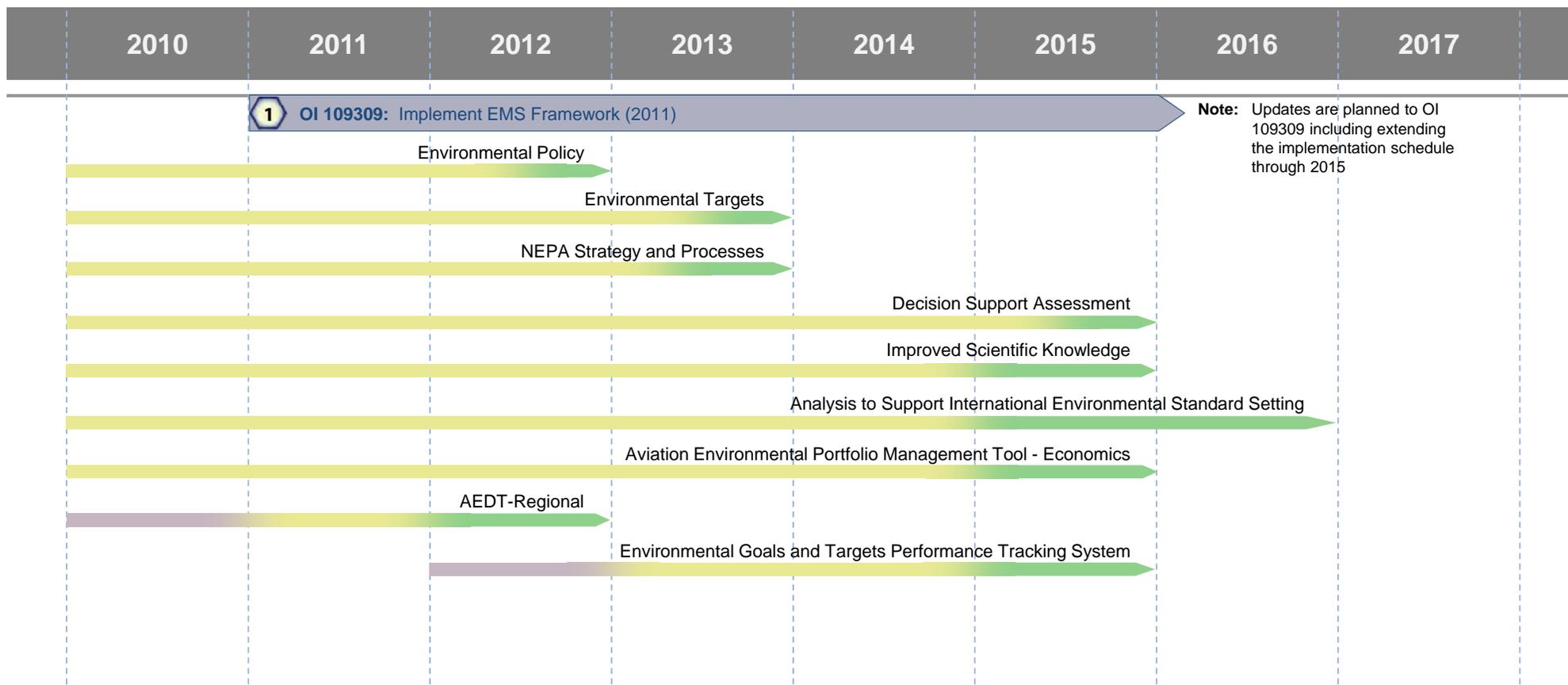
This increment will explore and qualify additional classes of sustainable aviation alternative fuels blends that use novel feedstocks and conversion processes (e.g., advanced fermentation, alcohol oligomerization, pyrolysis, etc.). Efforts include environmental and performance feasibility through air quality and life-cycle emissions analyses, fuel properties analysis, engine performance evaluation, and ground tests and flight demonstrations by 2015. These efforts will advance deployment of these sustainable alternative fuels, including environmental acceptability and ASTM approval.

4 OI 109311: Environmentally and Energy Favorable En Route Operations

This will optimize en route operations to reduce emissions, fuel burn and noise. New operational capabilities will be applied, such as advanced aircraft technologies, including capabilities for FMS and avionics to achieve more efficient en route operations. Improved efficiency in operations will provide system-wide benefits, including benefits to sensitive areas (e.g., national parks).

5 OI 109313: Environmentally and Energy Favorable Terminal Operations

Optimize aircraft arrival, departure and surface operations to reduce emissions, fuel burn and noise through the use of environmentally friendly procedures. Develop Standard Terminal Arrival Route (STAR) procedures that permit use of the Optimized Profile Descent (OPD) technique (also known as Continuous Descent Arrival). Develop Area Navigation (RNAV) Standard Instrument Departure (SID) procedures that minimize level segments on climb-out. Develop enhanced surface operation mechanisms and procedures to maximize airport throughput while further reducing aircraft fuel burn and emissions.



NextGen EMS Frameworks and Stakeholder Collaboration

AEDT-Airport

2 OI 109315: Implement NextGen Environmental Engine and Aircraft Technologies (2010-2015)

Open Rotor

Twin Annular Premixing Swirler II Lean Combustor

Adaptive Trailing Edges

Ceramic Matrix Composite Turbine Blade Tracks

Ceramic Matrix Composite Acoustic Nozzle

Engine Weight Reduction and High-Temperature Impeller

Dual-Wall Turbine Blade

FMS – ATM Integration

Ultra High-Bypass Ratio Geared Turbo Fan

3 OI 09316: Increased Use of Alternative Aviation Fuels (2011-2015)

Drop-In HRJ Blend Fuels

Other Advanced Aviation Alternative Fuels

4 OI 109311: Environmentally and Energy Favorable En Route Operations (2015)

5 OI 109313: Environmentally and Energy Favorable Terminal Operations (2015)

Note: Increments associated with OI 109311 and OI 109313 are addressed through other portfolios that affect operational efficiency, capacity and/or flexibility



Selected Work Activities

Budget Line	Task Force	Activity	Description	OIs	FY 2010	FY 2011	FY 2012 – Mid-term
System Development		Environment and Energy-EMS and Advanced Noise and Emission Reduction	Manages environmental impacts of NextGen through EMS based on development and demonstration of solutions to mitigate noise and emissions as well as increasing fuel burn efficiency. Research, development, demonstration and testing help support operation implementation by 2015.	109309 109310 109311 109313 109315 109316	✓ Developed report on EMS framework development; activities of CLEEN Consortium; metrics for carbon dioxide emissions standard; and opportunities for operational procedures	<ul style="list-style-type: none"> • Conduct EMS refinement and pilot studies • Test, demonstrate and evaluate NAS-wide environmental benefits of CLEEN aircraft and fuel technologies 	<ul style="list-style-type: none"> • Research potential policies and procedures to reduce environmental impacts beyond current set of operational procedures • Finalize NextGen EMS implementation in initial FAA organizations • Assess the impacts on NAS-wide operations (including environmental performance) of aircraft standards for noise and emissions • Assess the NAS-wide benefits of CLEEN aircraft technologies and alternative fuels • Identify opportunities for environmental gains for taxi/ramp, terminal • Demonstrate environmental control algorithms used in taxi/ramp, terminal, and en route procedures • Perform analysis for EMS environmental impacts and metrics • Analyze NEPA compliance within the EMS framework

Common Services and Infrastructure



Surveillance Common Service

New surveillance infrastructure, technologies and applications will be deployed to improve situational awareness.

New Services: Surface Surveillance, Surface Sensors and Indicators, Surface Traffic Broadcast, Surface Automation Decision-Support Tools, Surface External Data Exchange Service, Surface Broadcast Flight and NAS Status Information to Pilots, Oceanic Automation Support for Separation Management

Task Force: *NAS Access*

Communications Common Service

New International Civil Aviation Organization (ICAO)-compliant digital communications infrastructure and technologies will provide a supplemental means for two-way exchange between controllers and flight crews for air traffic control (ATC) clearances, instructions, advisories, flight crew requests and reports.

New Services: Tower Data Communications for Revised Departure Clearances, Oceanic Data Communications

Task Force: *Cross-Cutting*

Aeronautical Common Service

New Aeronautical Information Management automation infrastructure will be acquired and implemented in a standardized enterprise-compliant fashion, providing a single authoritative source for aeronautical data management.

New Services: Airspace Configuration, Status Information, and Route/Procedures Data, Static Airport Data Management, Digital Notices to Airmen (NOTAMs)

Task Force: *Surface and Cruise*

Flight Common Service

New Flight Information Management automation infrastructure will be acquired and implemented in a standardized enterprise-compliant fashion, providing a common interface among National Airspace System (NAS) automation systems, service providers and users.

New Services: Terminal Data Distribution, Flight Data Publication, Reroute Data Exchange, Flow Information Publication, Track Information Service

Task Force: *Cross-Cutting*

Weather Common Service

New weather infrastructure will provide improved weather information in a standard enterprise-compliant fashion.

New Services: Common Weather Picture, Net-centric Dissemination, Proactive Notification of Significant Weather Changes, Enhanced Forecasts for Aviation, Winds and Temperatures for Trajectory Modeling, Tailored Volumetric Retrievals of Forecast and Observation Information, Characterizations of Potential Weather-Constrained Airspace

Common Services and Infrastructure (cont'd)

Selected Work Activities

Budget Line	Task Force	Activity	Description	FY 2010	FY 2011	FY 2012 – Mid-term
ADS-B	28	Automatic Dependent Surveillance-Broadcast (ADS-B) NAS-wide Implementation	Provides highly accurate and more comprehensive surveillance information via a broadcast communication link. ADS-B receives flight data from aircraft, via a data link, derived from on-board position-fixing and navigational systems. Aircraft position (longitude, latitude, altitude and time) is determined using GPS, an internal inertial navigational reference system, or other navigation aids.	<ul style="list-style-type: none"> ✓ Completed In-Service Decision for Critical Services ✓ Continued to deploy ADS-B ground infrastructure ✓ Provided Initial Operating Capability: <ul style="list-style-type: none"> o Philadelphia o Juneau ✓ Published final ADS-B Out rule in Federal Register ✓ Completed Phase 1 of the Colorado Wide Area Multilateration System covering the En Route Services supporting Yampa Valley, Craig-Moffat, Steamboat Springs and Garfield County Regional airports 	<ul style="list-style-type: none"> • Continue to deploy ADS-B ground infrastructure • Pursue ADS-B program expansion to provide surveillance services in non-radar airspace 	<ul style="list-style-type: none"> • Complete NAS-wide deployment of ADS-B, Traffic Information Services-Broadcast (TIS-B) and Flight Information Services-Broadcast (FIS-B) • Provide Initial Operating Capability for Surface Alerting
Data Comm	16 17 39 44 42	Data Communications (Data Comm)	Implements Data Comm capabilities that provide new methods for delivery of departure clearances, revisions and taxi instructions in the terminal environment, specifically in the tower. In the en route environment, Segment 1 will provide the basic capabilities for controllers and flight crews to transfer ATC clearances, requests, instructions, notifications, voice frequency communications transfers and flight crew reports as a supplement to voice.		<ul style="list-style-type: none"> • Release solicitation for Data Comm Network Service Provider • Initiate development of revised departure clearance capability in tower 	<ul style="list-style-type: none"> • Deliver a final investment decision on Data Comm Segment 1 • Initiate development of en route automation enhancements • Enable revised departure clearance capability in the tower environment via VHF Data Link (VDL) mode 2 for aircraft equipped with Future Air Navigation System (FANS) 1/A+

Budget Line	Task Force	Activity	Description	FY 2010	FY 2011	FY 2012 – Mid-term
NVS		NAS Voice System (NVS)	Provides the connectivity for efficient communications among air traffic controllers, pilots and ground personnel. It connects incoming and outgoing communication lines via a switching matrix to the controller's workstation.	<ul style="list-style-type: none"> ✓ Completed cost analysis for business case analysis report ✓ Completed required sections of implementation strategy and planning document ✓ Completed business cost analysis report 	<ul style="list-style-type: none"> • Initiate preliminary development of documentation for JRC decisions 	<ul style="list-style-type: none"> • Achieve final JRC decision to proceed with program • Award production contract • Install at key site • Achieve Initial Operating Capability of systems
SWIM	40 35	System Wide Information Management (SWIM)	Provides policies and standards to support data management, secure its integrity, and control its access and use.	<ul style="list-style-type: none"> ✓ Developed and tested the Aeronautical Information Management (AIM) portion of the Special Use Airspace (SUA) 	<ul style="list-style-type: none"> ✓ Provided Corridor Integrated Weather System publication • Provide reroute data exchange capability • Provide flight data publication initial flight data services • Provide Integrated Terminal Weather System publication 	<ul style="list-style-type: none"> • Publish data for the following: <ul style="list-style-type: none"> ○ Pilot Weather Report ○ TFM ○ Flight Data ○ Runway Visual Range • Provide Terminal Data Distribution Capability • Provide Flight Data Services with Publish/Subscribe • Provide Flight Data Publication Host Air Traffic Management Data Distribution System/Flight Data Input/Output and AIM SUA Client
CATMT	47	Collaborative Air Traffic Management Technologies (CATMT)	Identifies cognitive support and displays change requirements necessary for a transition to a high-altitude specialty that addresses the FAA's Flight Plan goals for capacity and organization excellence.	<ul style="list-style-type: none"> ✓ Completed CATMT Work Package 1 with the development of the Impact Assessment and Resolution capability ✓ Initiated the analysis necessary to develop the requirements needed to implement proven decision-support tools and data-sharing capabilities 	<ul style="list-style-type: none"> • Continue CATMT Work Package 3 concept engineering and planning to support the following capabilities: <ul style="list-style-type: none"> ○ Modernization of the decision-support tool suite ○ Collaborative information exchange • Continue the analysis necessary to develop the requirements needed to implement proven decision-support tools and data-sharing capabilities 	<ul style="list-style-type: none"> • Deploy CATMT Work Package 2 capabilities to include: <ul style="list-style-type: none"> ○ Arrival uncertainty management ○ Weather integration ○ Collaborative airspace constraint resolution ○ Airborne reroute execution • Upgrade the existing Traffic Flow Management System to include an initial electronic negotiation capability for more efficient flight planning
NNEW		NextGen Network Enabled Weather (NNEW)	Provides common, universal access to aviation weather data.	<ul style="list-style-type: none"> ✓ Conducted demonstration to validate interoperability data standards and Web services with the development of the interagency 4D weather data cube ✓ Completed weather data and design standards 	<ul style="list-style-type: none"> • Perform functional analysis • Develop alternative analysis report 	<ul style="list-style-type: none"> • Initial Investment Decision for NNEW Segment 1

Common Services and Infrastructure (cont'd)

Selected Work Activities

Budget Line	Task Force	Activity	Description	FY 2010	FY 2011	FY 2012 – Mid-term
Demonstrations	28	Colorado Wide Area Multilateration Phase 2	Supports the Denver Air Route Traffic Control Center's ability to provide en route air traffic separation services to the following Colorado airports: Durango, Gunnison, Montrose, Telluride.		<ul style="list-style-type: none"> Approval of design covering critical and multilateration Services for Colorado Phase 2 Service Volumes 	
Networked Facilities		Integration, Development, and Operations Analysis Capability	Continues to enhance, operate and maintain the operations analysis capability to support the development of iterative designs to evaluate concepts and alternatives. This will provide for an integrated environment ranging from low- to high-fidelity capabilities to support NextGen concept validation and requirements, which are required to facilitate the transition of NextGen technologies in the NAS.	<ul style="list-style-type: none"> Completed support to the Unmanned Aircraft System (UAS) initial NAS Integration and Staffed NextGen Tower studies 	<ul style="list-style-type: none"> Enhance and sustain the NextGen Integration and Evaluation Capability (NIEC) at the Technical Center Focus on integrating new technologies into existing NIEC capabilities that will enable the customer to: <ul style="list-style-type: none"> Iteratively evaluate design concepts and alternatives Determine quantitative metrics to define and validate human performance, usability, workload and safety indicators Design and conduct experiments to assess software, hardware and prototypes for research, system analyses and/or definition and refinement of requirements Provide interfacility capabilities Enhance NIEC data collection capabilities 	<ul style="list-style-type: none"> Complete full initial capability of the NIEC Integrate cockpit simulator into the NIEC Continue to integrate additional capabilities into the NIEC display area
Networked Facilities		NextGen Test Bed/ Demonstration Sites	Continues to expand the NextGen Test Bed capabilities in Daytona Beach, Fla., and initiate planning activities in Texas. This program will continue integration activities between the NextGen Test Beds, increase system capabilities and improve operational fidelity of the environment. The NextGen Test Bed is a multi-domain demonstration and testing facility that integrates individual airspace domains and allows for end-to-end demonstrations, evaluations and testing at one or more physical sites in line with the NextGen gate-to-gate concept.	<ul style="list-style-type: none"> Supported Transform Facilities Solution Set Completed Florida Test Bed Segment 1 Implementation Plan, site engineering/ design package, system delivery and system capability briefing package 	<ul style="list-style-type: none"> Complete Florida Test Bed Segment 2 System Requirements Document 	<ul style="list-style-type: none"> Continue to expand NextGen Test Bed capabilities in Florida to support future demonstrations Establish information exchange capabilities with other NextGen Test Bed and stakeholder sites Initiate NextGen interactivity between Florida and NASA North Texas Research Station for enhanced terminal and surface capabilities Expand telecommunication infrastructure to allow improved live data capabilities Expand site integration capabilities among all three sites Establish telecommunication circuits for initial live data capability Support standards and alternatives development

Budget Line	Task Force	Activity	Description	FY 2010	FY 2011	FY 2012 – Mid-term
Networked Facilities		Future Facilities Investment Planning	Supports optimization of FAA's air traffic service provider resources. Considers infrastructure alternatives and associated benefits which include improved work environment, reduced time and cost to train controllers, seamless information exchange, and reduced overall air traffic service provider costs while still increasing the level of service.		<ul style="list-style-type: none"> • Prepare initial business case for segment 1 	
Airport Improvement Program*		Airfield Development	Continues the development of new runways and extensions to increase capacity and efficiency.	<ul style="list-style-type: none"> ✓ Conducted Future Airport Capacity Task 2 (FACT2) next steps, including coordination of airport action plans ✓ Completed Charlotte-Douglas International runway 18R/36L ✓ Completed reconstruction of New York JFK runway 13R/31L and associated taxiway improvements 	<ul style="list-style-type: none"> ✓ Completed Portland International runway 10L/28R Extension ✓ Completed Philadelphia International Environmental Impact Statement and signed a Record of Decision • Begin FACT3 to identify capacity-constrained airports in 2020 and 2030 • Complete Anchorage International runway 7R/25L extension • Continue New York JFK taxiway improvements • Complete Phase II of the San Francisco Bay Area Regional Airport Plan • Complete Phase II of the Atlanta Metropolitan Aviation Capacity Study • Continue surveys to support development of Wide Area Augmentation System (WAAS)/Localizer Performance with Vertical Guidance (LPV) approach procedures to increase access to airports. Consider obstruction removal needs so that airports with LPV approach procedures can achieve lower minimums • Fund metro area airport infrastructure improvements at other than OEP airports 	<ul style="list-style-type: none"> • Complete Atlanta Hartsfield-Jackson International runway 9L/27R extension • Complete FACT3 and identify follow-on strategic planning initiatives • Continue planning and environmental projects • Complete San Antonio International runway 3/21 extension • Complete Port Columbus International Airport runway 10R/28L relocation • Complete Chicago O'Hare runway 10C/28C • Complete Fort Lauderdale/Hollywood International Airport runway 9R/27L
*Not considered NextGen funding						

NextGen Concept Maturity and System Development



1 OI 102114: Initial Conflict Resolution Advisories

Automation enables the Air Navigation Service Provider (ANSP) to better accommodate pilot requests for trajectory changes by providing conflict detection, flight planning, and development and rank-ordering of resolutions taking into account aircraft capabilities and pilot and ANSP preferences.

2 OI 102118: Delegated Responsibility for In-Trail Separation

Enhanced surveillance and new procedures enable the ANSP to delegate aircraft-to-aircraft separation. Improved display avionics and broadcast positional data provide detailed traffic situational awareness to the flight deck. When authorized by the controller, pilots will implement delegated separation between equipped aircraft using established procedures.

3 OI 102123: Automatic Dependent Surveillance-Broadcast (ADS-B) Separation

ANSP automation uses ADS-B in non-radar airspace to provide reduced separation and flight following. Improved surveillance enables ANSP to use radar-like separation standards and services.

Task Force: NAS Access

4 OI 102144: Wake Turbulence Mitigation for Arrivals: Closely Spaced Parallel Runways (CSPRs)

Changes to wake separation minima are implemented based on measured and predicted airport area winds. Supporting procedures, developed at applicable locations based on analysis of wake measurements and safety, allow more closely spaced arrival operations increasing airport/runway capacity in Instrument Meteorological Conditions.

Task Force: Runway Access

5 OI 102406: Provide Full Surface Situation Information

Surface Situation Information will complement visual observation of the airport surface. Decision support system algorithms will use enhanced target data to support identification and alerting of those aircraft at risk of runway incursion.

Task Force: Surface

6 OI 103104: Deploy Flight Information Services-Broadcast (FIS-B) Nationally

FIS-B weather processors generate graphical and textual products for broadcast to equipped aircraft in coverage areas. FIS-B products include precipitation, convective activity, in-flight icing, low-ceiling/visibility maps, turbulence information and site-specific weather reports and forecasts.

7 OI 103116: Initial Improved Weather Information from Non-Ground-Based Sensors

Additions to the sensor network from non-ground-based sensors (e.g., satellite and aircraft) provide operators and the ANSP with enhanced weather information to improve flight and clearance planning, trajectory-based operations and flow management.

8 OI 103119: Initial Integration of Weather Information into National Airspace System (NAS) Automation and Decision Making

Advances in weather information content and dissemination provide users and/or their decision support with the ability to identify specific weather impacts on operations (e.g., trajectory management and impacts on specific airframes, arrival/departure planning) to ensure continued safe and efficient flight.

9 OI 103206: Expanded Traffic Advisory Services Using Digital Traffic Data

Equipped aircraft receive broadcasts and display traffic data to the flight crew. Ground-based systems receive surveillance broadcast reports and provide them to the surveillance data network for distribution.

10 OI 104122: Integrated Arrival/Departure Airspace Management

New airspace design takes advantage of expanded use of terminal procedures and separation standards. This capability expands the use of terminal separation standards and procedures (e.g., 3 nm, degrees divergence) within the newly defined transition airspace. It extends further into current en route airspace (horizontally and vertically).

Task Force: Integrated ATM

11 OI 104128: Time-Based Metering in the Terminal Environment

Aircraft are time-based metered inside the terminal environment, enhancing efficiency through the optimal use of terminal airspace and surface capacity. This extends current metering capabilities into the terminal environment and furthers the pursuit of end-to-end metering and trajectory-based operations.

Task Force: Integrated ATM

12 OI 106202: Enhance Emergency Alerting

Controllers and search and rescue support, using ADS-B to provide location information and discrete aircraft identification, are able to quickly locate distressed or downed aircraft without resorting to 1,200 beacon tracks and support from Civil Air Patrol search flights.

13 OI 107116: Low-Visibility/Ceiling Departure Operations

Leverages augmented Global Navigation Satellite System capabilities to allow appropriately equipped aircraft to depart in low-visibility conditions. Due to onboard avionics the aircraft will be able to depart in low-visibility conditions using Area Navigation (RNAV)/Required Navigation Performance (RNP) Standard Instrument Departures, Electronic Flight Vision System, Synthetic Vision System, or advanced vision systems.

14 OI 107202: Low-Visibility Surface Operations

Aircraft and ground vehicle movement on airports in low-visibility conditions is guided by accurate location information and moving map displays.

Task Force: Surface

15 OI 108206: Flexible Airspace Management

ANSP automation supports reallocation of trajectory information, surveillance, communications, and display information to different positions or different facilities.

16 OI 109302: Security – Operational Capability for Threat Detection and Tracking, NAS Impact Analysis and Risk-Based Assessment

The Operational Security Personnel of the ANSP address NAS security threats by more effective and efficient prevention, protection, response and recovery based on net-enabled shared situational awareness and a risk-informed decision-making capability. Flight risk profiles are derived from trajectory-based risk assessment provided by the ANSP and risk levels provided by the Security Service Provider.

17 OI 109304: Enhanced Aviation Safety Information and Analysis and Sharing (ASIAS)

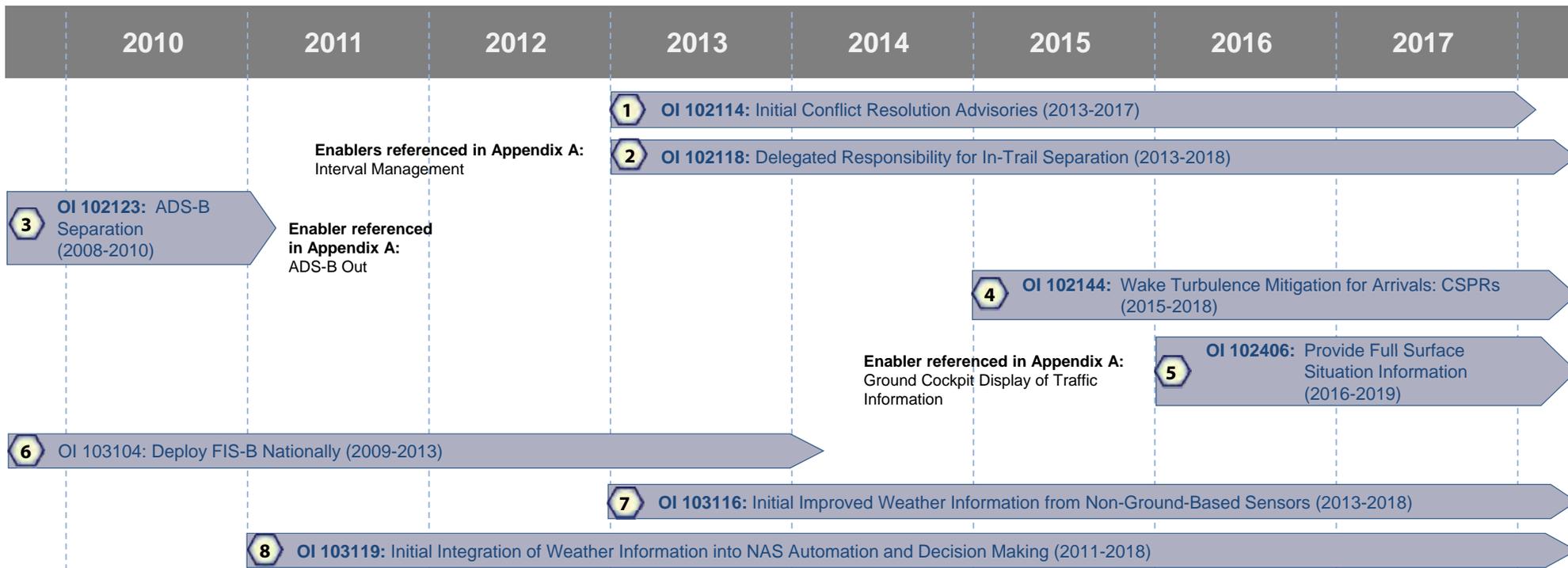
ASIAS will improve system-wide risk identification, integrated risk analysis and modeling, and implementation of emergent risk management.

18 OI 109305: Improved Safety for NextGen Evolution

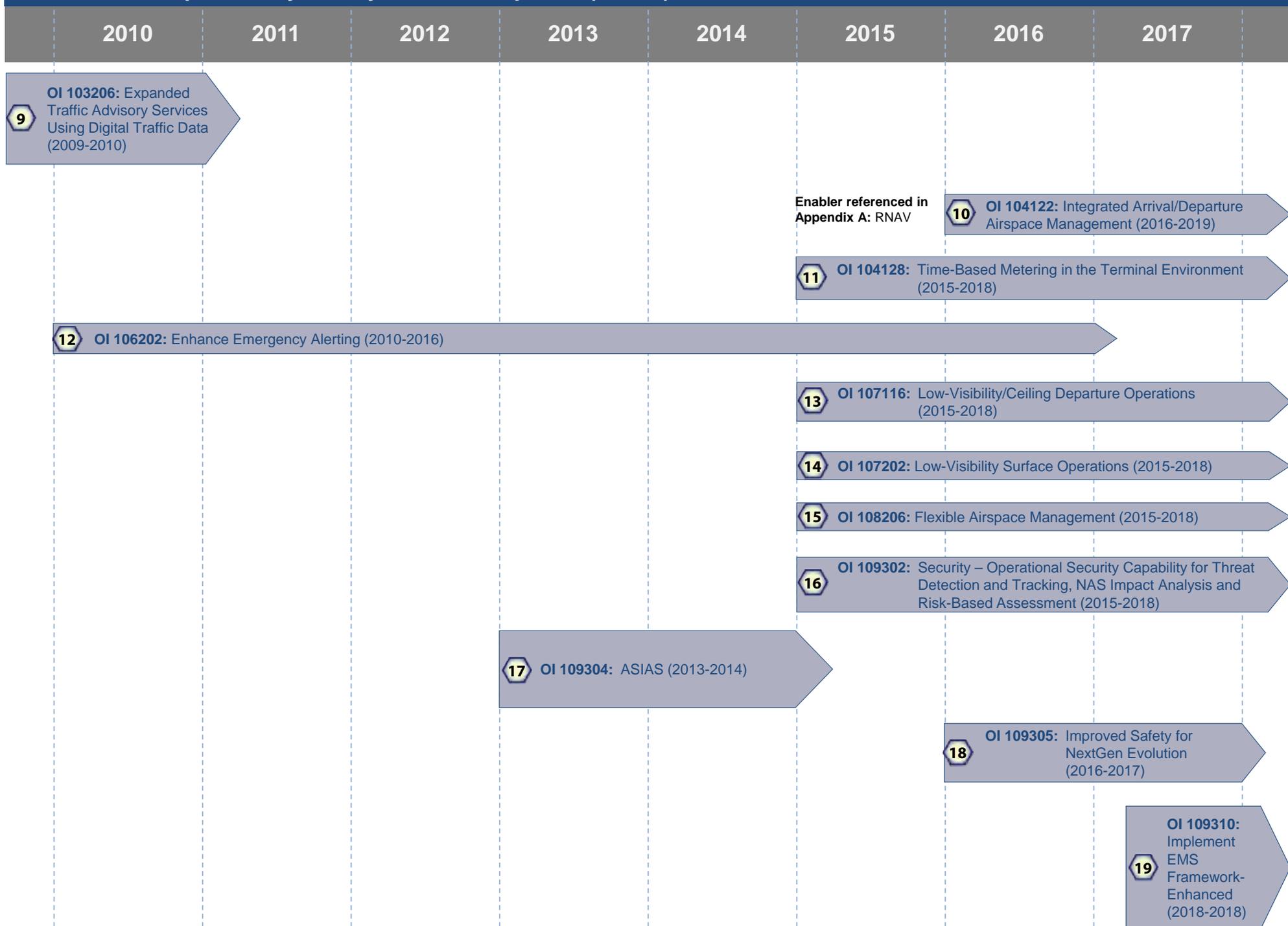
This OI mitigates safety risk associated with the evolution of NextGen by providing enhanced safety methods that support making changes to the air transportation system, including: advanced capabilities for integrated, predictive safety assessment; improved validation and verification processes supporting certification; an enhanced focus on safe operational procedures; and enhanced training concepts for safe system operation.

19 OI 109310: Implement Enhanced EMS Framework

Further enable the use of the Environmental Management System (EMS) framework for subsequent applications, including refined environmental goals and decision support tools, to address, plan and mitigate environmental issues through implementation of ongoing EMS improvements and availability of enhanced environmental information.



NextGen Concept Maturity and System Development (cont'd)



Selected Work Activities

Budget Line	Task Force	Activity	Description	OIs	FY 2010	FY 2011	FY 2012 – Mid-term
Collaborative Air Traffic Management		Capacity Management, Dynamic Airspace	Provides the tools to air traffic managers to reconfigure airspace to expand or contract control sectors to match the overall level of activity in the facility's airspace and to dynamically deactivate restrictions. The Airspace Resource Management System (ARMS) will provide the tools for controlling the reconfiguration of the NextGen networked communications infrastructure in response to an operational requirement for reconfigurable airspace.	108206	✓ Initiated multi-year program plan	<ul style="list-style-type: none"> Develop preliminary ARMS concept of operation document Deliver white paper on ARMS functional description 	<ul style="list-style-type: none"> Develop ARMS evaluation model Conduct demonstration of ARMS prototype
Collaborative Air Traffic Management		Flight and State Data Management, Concept Development for Integrated NAS Design and Procedure Planning	Develops a framework for integrated National Airspace Design and Procedures planning, enhancements to existing infrastructure to support impact assessments, and develop initial concept for best-equipped, best-served.	108209		<ul style="list-style-type: none"> Initiate analysis of equipage and avionics capabilities required through the mid-term to support best-equipped, best-served 	<ul style="list-style-type: none"> Adapt existing automation displays to provide airport surface surveillance Develop "blended airspace" procedures
Arrivals/ Departures at High Density Airports	4 21a 32b	Capacity Management - Integrated Arrival and Departure Operations (Big Airspace)	Provides an integrated approach to arrival and departure management throughout the major metropolitan airspace by incorporating terminal and transition airspace and procedures into one service volume.	104122	✓ Completed a preliminary operational safety assessment and an assessment of procedural changes needed to support this concept		<ul style="list-style-type: none"> Develop and mature initial automation, surveillance and flight data requirements Conduct technical transfer of automation, surveillance and flight data requirements Support airspace design/analysis, transition strategy plans and procedures development for initial selected locations
Arrivals/ Departures at High Density Airports		Capacity Management - Integrated Arrival and Departure Control Service	Provides an integrated approach to arrival and departure management throughout the major metropolitan airspace by incorporating terminal and transition airspace and procedures into one service volume.	104122	✓ Conducted pre-implementation analyses on flight data processing due to the large volume of airspace and the integration of terminal, transition and overflight environments		
Trajectory Based Operations		Separation Management, High Altitude	Identifies cognitive support and display change requirements necessary for a transition to a high-altitude specialty that addresses the FAA's Flight Plan goals for capacity and organization excellence.	108209	✓ Conducted Fast-Time Analyses for Trajectory Based Operations (TBO) in high-altitude airspace	<ul style="list-style-type: none"> Conduct integrated Human-in-the-Loop (HITL) simulation of high-altitude concept 	<ul style="list-style-type: none"> Conduct concept validation activities to support refinement of high-altitude concept elements such as generic airspace and flexible airspace Refine the High-Altitude Research Management Plan as required based on the findings of concept validation activities Update the high-altitude concept of operations to reflect results of completed high-altitude simulations, fast-time analyses and other research activities Develop recommendations on future program plans based on FY 2011-2012 findings

Selected Work Activities

Budget Line	Task Force	Activity	Description	OIs	FY 2010	FY 2011	FY 2012 – Mid-term
Flexible Terminal Environment	25	Trajectory Management, Arrivals (RNAV/RNP) with 3D and Required Time of Arrival (RTA)	Evaluates the ability of aircraft to accurately meet vertical constraints and time of arrival. Evaluates the advantages and disadvantages with imposing vertical constraints and RTA in different congestion scenarios. Also evaluates Data Comm capabilities for aircraft messaging for RTA, and reroutes.		<ul style="list-style-type: none"> ✓ Performed initial 4D Flight Management System (FMS) TBO concept validation and analysis of performance capabilities and standards 	<ul style="list-style-type: none"> • Conduct RTA proof of concept demonstration 	<ul style="list-style-type: none"> • Perform initial 4D FMS TBO concept validation and analyses of performance capabilities and standards • Evaluate the ability of aircraft to accurately meet vertical constraints and required time of arrival • Evaluate the advantages and disadvantages associated with imposing vertical constraints and required time of arrival in different congestion scenarios from the aircraft operator and air traffic management (ATM) perspectives • Evaluate Data Comm for aircraft messaging for RTA, reroutes and waypoint verification data integrity • Evaluate ground merging and sequencing tools that will employ control by time of arrival (identify enabling requirements) • Conduct human factors analysis shifting to control by time of arrival through controller-in-the-loop simulations and field trials • Conduct analysis of human factors and flight deck automation requirements to minimize errors and provide integrity assurance
Demonstration		Unmanned Aircraft Systems (UAS) Demonstration	Proves the viability of UAS to operate safely in the NAS without undue risk.	102137	<ul style="list-style-type: none"> ✓ Conducted UAS demonstration incorporating two NextGen technologies, ADS-B and NAS Voice System (NVS), to mitigate operational issues: <ul style="list-style-type: none"> ○ Enhanced traffic situational awareness from a cockpit display of traffic information (CDTI) ○ Proof of concept for NVS 	<ul style="list-style-type: none"> • Initiate UAS demonstration that will explore NextGen 4D trajectory concepts 	<ul style="list-style-type: none"> • Demonstration 4: Conduct integrated operational UAS demonstration with 4DT FMS, ADS-B/Traffic Information Services-Broadcast (TIS-B)/FIS-B and NVS-prototype Voice over Internet Protocol
Reduce Weather Impact		Reduce Weather Impact (NextGen Weather Processor)	Provides improved weather observations and forecasts and tailors weather data for integration into decision support tools for collaborative and dynamic NAS decision making		<ul style="list-style-type: none"> ✓ Established NextGen Weather Processor test bed 	<ul style="list-style-type: none"> • Risk reduction activities • Market survey for NextGen Weather Processor capabilities 	<ul style="list-style-type: none"> • Initial investment analysis • Complete NextGen Weather Processor risk mitigation strategy Phase 2

Budget Line	Task Force	Activity	Description	OIs	FY 2010	FY 2011	FY 2012 – Mid-term
Safety, Security and Environmental Performance		Security Integrated Tool Set (SITS)	Finalizes the business case, safety management document, NAS enterprise architecture artifacts, and requirements documents.		<ul style="list-style-type: none"> ✓ Completed SITS concept exploration and business case methodology/ analysis 	<ul style="list-style-type: none"> • Develop an implementation strategy and planning document 	<ul style="list-style-type: none"> • Award contract for SITS development, and initiate development activities • Continue development of initial SITS capabilities • Transition to initial operational capability
System Development		Operational Assessments	Conducts integrated assessments to ensure that safety, environmental and system performance considerations are properly addressed throughout the integration and implementation of NextGen.		<ul style="list-style-type: none"> ✓ Developed and applied models to support the operational performance, safety and environmental integrated assessments of NextGen airspace/procedure and system changes 	<ul style="list-style-type: none"> • Assess and integrate the local, regional, NAS-wide analysis capability of Aviation Environmental Design Tool (AEDT) and develop plans for further enhancements • Assess and integrate the local, regional, NAS-wide analysis capability of Aviation Portfolio Management Tool (APMT) and develop plans for further enhancements • Develop options to integrate environmental assessment capability with NextGen NAS models • Develop NextGen NAS-wide environmental mitigation and cost-beneficial options for decision support • Enhance safety model to support NextGen operational assessments • Enhance operational performance model to support NextGen operational assessments 	<ul style="list-style-type: none"> • Develop, evaluate and implement further enhancements for the NextGen local, regional, NAS wide scale analysis capability in the AEDT • Develop, evaluate and implement further enhancements for the NextGen local, regional, NAS-wide scale analysis capability in the APMT • Perform NextGen environmental analyses for fleet and operations sequencing • Enhance safety model to support NextGen operational assessments • Enhance operational performance model to support NextGen operational assessments
System Development		Air Traffic Control (ATC)/Tech Ops Human Factors	Conducts system engineering and other technical support to fully integrate human factors considerations into the NextGen portfolio and conducts focused human factors studies in areas such as controller workload and work station interfaces.		<ul style="list-style-type: none"> ✓ Delivered initial NextGen common workstation requirements document ✓ Delivered initial human error safety analysis of mid-term operations ✓ Delivered initial tower workstation requirements 	<ul style="list-style-type: none"> • Develop common automation platform requirements development and simulation • Develop Traffic Flow Management human factors operational sequences • Develop air/ground integration HITL simulation plan 	<ul style="list-style-type: none"> • Complete a strategic job analysis of the new roles of air traffic service providers using a highly automated system, sharing separation responsibilities with pilots, and moving toward performance-based services • Demonstrate collaborative air traffic management efficiencies • Demonstrate integration of air and ground functional capabilities • Identify changes in controller procedures to support pilot separation responsibility when using cockpit display of traffic information • Demonstrate controller use of NextGen concepts, capabilities and procedures supporting transition of self separation responsibility to pilots

Selected Work Activities

Budget Line	Task Force	Activity	Description	OIs	FY 2010	FY 2011	FY 2012 – Mid-term
System Development		Systems Safety Management Transformation	<ul style="list-style-type: none"> Develops tools and supporting processes leading to a comprehensive and proactive approach to aviation safety in conjunction with implementation of NextGen capacity and efficiency capabilities. The implementation of these capabilities will require changes in the process of safety management, the definition and implementation of risk management systems, and management of the overall transformation process to ensure that safety is not only maintained but improved. Develops and implements the ASIAs system, which provides the capability to integrate data from public and non-public sources spanning commercial aviation, while maintaining data protection. This capability and the use of advanced data mining tools allow the early identification and mitigation of emerging risks to the aviation system. Creates system-wide risk baselines, and annual impact assessment of changes, including NextGen, on safety risk. Ensures highly capable and consistent risk assessment processes through Safety Risk Management (SRM) processes and taxonomy, analytical methods and integrated evaluation applications. Develops new methods to ensure continual surveillance of Design Approval Holder compliance with Safety Management System (SMS) requirements. 		<ul style="list-style-type: none"> ✓ Began implementing enhanced ASIAs, including the selected support architecture and requirements for information security, near real-time operations and new and expanded participants 	<p><u>ASIAs</u></p> <ul style="list-style-type: none"> Provide capability across all commercial aviation nodes to fuse data from public and non-public sources while maintaining data protection Evolve more sophisticated text mining capabilities across data sources, including flight operations, maintenance, dispatch, ATC operations and aviation safety reporting system Provide initial ability to automatically monitor for unknown risk based on complex text mining capabilities and seamless data sources Integrate data from at least one additional class of operations in the U.S. domestic airspace Conduct demonstration project with limited set of Joint Planning and Development Office participants for analysis of safety metrics and directed studies <p><u>System Safety Assessment (SSA)</u></p> <ul style="list-style-type: none"> Develop user and system requirements for system baseline risk estimation Develop standard user requirements for development and installation of a risk analysis function and application to NextGen concept in surface operations into the operational ASIAs platform <p><u>SMS</u></p> <ul style="list-style-type: none"> Develop a method that can be used for continual surveillance of Design Approval Holder compliance with SMS <p><u>SRM</u></p> <ul style="list-style-type: none"> Develop guidance on taxonomy, analytical methods and integrated evaluation applications that ensure that consistent risk assessment processes are employed throughout the FAA Office of Aviation Safety 	<ul style="list-style-type: none"> Create policy, process standards, risk assessment/management tools, analysis infrastructure and rudimentary safety assurance framework Demonstrate a national-level SSA working prototype that will proactively identify emerging risk across the NextGen Develop proof of concept for NextGen SMS including a prototype to implement on a trial basis with selected participants that involve a cross-section of air service providers

Budget Line	Task Force	Activity	Description	OIs	FY 2010	FY 2011	FY 2012 – Mid-term
System Development		New ATM Requirements	Conducts research across all solution sets, focused on maturing concepts and technologies targeting application toward the end of the NextGen mid-term.		<ul style="list-style-type: none"> ✓ Provided recommendations for an aeronautical mobile airport communications system standard ✓ Defined baseline Requirements for Future Traffic Alert and Collision Avoidance System ✓ Developed initial airborne SWIM concept of use 	<ul style="list-style-type: none"> • Conduct system design for future air-ground data communications requirements implementing flexible airspace management • Begin requirements definition for common trajectory implementation • Conduct initial analysis of common trajectory needs and develop initial implementation strategy • Conduct engineering trade study for weather radar replacement • Provide analysis, requirements, pseudo-code-supports for effective collision risk safety net in an environment of closely spaced parallel RNP route from top-of-descent to the runway 	<p><u>Terminal Collision Avoidance System</u></p> <ul style="list-style-type: none"> • Define baseline requirements for future Collision Avoidance Systems • Develop an integrated approach between separation assurance and collision avoidance with special attention to safety <p><u>Trajectory Modeling</u></p> <ul style="list-style-type: none"> • Determine conflict resolution approaches using aircraft intent data • Develop evaluation model to assess common trajectory • Develop NAS-wide trajectory prediction requirements in the mid-term • Develop common trajectory message format and standard • Develop safety assessments <p><u>Weather Radar Replacement</u></p> <ul style="list-style-type: none"> • Complete technology demonstration development and conduct evaluations • Prototype demonstration
System Development		Operations Concept Validation, Validation Modeling	Addresses developing and validating future end-to-end operational concepts with special emphasis on researching changes in roles and responsibilities between the FAA and airspace.	108206	<ul style="list-style-type: none"> ✓ Generated Time Based Flow Management (TBFM) transient analysis results on the effectiveness of various alternatives to mitigate the impact of transient events on TBFM 	<ul style="list-style-type: none"> • Develop draft 2nd level NextGen concept of operations for the NAS (2025) 	<ul style="list-style-type: none"> • Conduct HITL simulations of trajectory based operations for integrated TBFM • Validate concepts through detailed analyses including analytical modeling, fast-time simulations, and HITL simulations and demonstrations
System Development		Staffed NextGen Towers (SNT)	Demonstrates the concept of, and develops the necessary requirements, specifications and supporting documentation for, SNT. SNT may allow for the cost-effective expansion of services to a larger number of airports, and reduce tower construction costs.		<ul style="list-style-type: none"> ✓ Conducted demonstration activities ✓ Continued detailed engineering analysis and requirements validation activities 	<ul style="list-style-type: none"> • Develop performance standards and SNT alternatives • Develop initial investment decision documentation including business case analysis report, implementation strategy and planning, and basis of estimate • Update Enterprise Architecture products and amendments • Maintain SNT equipment at field site (Dallas/Fort Worth) 	<ul style="list-style-type: none"> • Continue development of standards and alternatives • Begin development of an implementation strategy for SNT • Conduct system design activities including electronic data distribution integration, Data Comm integration and sub-system engineering activities • Procure and install Decision Support Tools (DST) for conformance monitoring, including hardware and software • Continue procurement and installation of DST • Support the development of concept of operations for flexible SNT and validation of flexible SNT

Selected Work Activities

Budget Line	Task Force	Activity	Description	OIs	FY 2010	FY 2011	FY 2012 – Mid-term
System Development		Wake Turbulence Recategorization	Develops new sets of tailored "leader aircraft" and "follower aircraft" wake separation standards whose application would depend on flight conditions and aircraft performance to enable increased capacity of flights into and out of airports to accommodate future demands.		<ul style="list-style-type: none"> ✓ Developed recommendation for an alternative set of wake separation standards ✓ Provided recommendation to International Civil Aviation Organization (ICAO) for action 	<ul style="list-style-type: none"> • Determine optimal set of aircraft flight characteristics and weather parameters for use in setting wake separation minimums • Develop metrics for setting tailored leader/follower aircraft wake mitigation separation standards 	<ul style="list-style-type: none"> • Determine changes to FAA air traffic control systems that will be required in the ICAO implementation of the revised wake separation standards developed earlier by this program • Develop a sample set of leader/follower aircraft wake mitigation separation standards • Determine the changes to FAA air traffic control systems required to implement the leader/follower tailored aircraft wake separation standards • Complete development of the leader/follower tailored aircraft wake separation standards along with the planning for implementing the associated procedures and processes • Continue development of wake separation processes that account dynamically for the wake generated by the lead aircraft • Develop enhancements to modeling that will enable their use in evaluating the proposed dynamic wake mitigation separation processes • Perform simulations to validate the operational feasibility of dynamic wake separation processes and procedures