

# FY09 NextGen Portfolio



Federal Aviation  
Administration

## *Oceanic Tactical Trajectory Management (OTTM)*

*Date:* December 2008

# Overview

## Oceanic Tactical Trajectory Management (OTTM)

- **Project Capability**
- **Project Smart Sheet**
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  - Problem/Performance Gap/Mission Shortfall Description
  - Project Objectives/Description of Solution
  - Support to Goals
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    - NextGen Implementation Plan
  - Interdependencies
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    - Projects/Demonstrations/Programs
- **Project Schedule – include deliverables and links to EA & Goals**
- **Project Risk Identification and Mitigation Strategy**
- **Project Details**
- **Supporting Activities – Policy, International efforts, Working Groups, etc.**
- **Key Personnel**



# Project Capability

- **System Capacity Efficiency Improvements**
  - Improved handling of diverse traffic via information sharing
  - Improved traffic routing and more efficient separation standards via better situational awareness and more accurate position prediction
  - Better use of oceanic system capacity via improved traffic routing and more efficient separation standards
  - More accepted pilot requests via more accurate situational awareness and position prediction
- **Operational Efficiency Improvements**
  - Reduced controller work load via automation
  - Reduced airlines schedule disruptions
  - Improved fuel efficiency
- **Global Harmonization**
  - Improved global harmonization via improved information sharing among air navigation service providers and the airlines
- **Flight Safety**
  - Improved situational awareness via better prediction capability
  - Improved safety via improved situational awareness and better conflict resolution

# Project Smartsheet - Description

## Oceanic Tactical Trajectory Management (OTTM)

- **The NextGen Concept of Operations and an Enterprise Architecture have been developed to establish a framework for the future by defining two major concepts:**
  - Four Dimension Trajectory Based Operations — The goal is allow flights to find their best route, rather than restrict them to controllable paths.
  - Air Traffic Management — The goal is to transition the FAA to a more collaborative environment to tailor aircraft profiles for optimum efficiency and safety.
- **Oceanic Tactical Trajectory Management (OTTM) is a critical NextGen capability that addresses current flight limitations and performance gaps in the NAS, particularly in the areas of capacity, productivity, efficiency, and safety in the oceanic environment.**



# Project Smartsheet – Problem/Performance Gaps

## Oceanic Tactical Trajectory Management (OTTM)

- **Flight profiles do not efficiently take advantage of airspace potential**
  - ATC has the big picture, but lacks tools to identify optimal flight profiles
  - Operators have tools to optimize individual flight profiles, but lack the big picture
- **Fuel efficiency is greatly reduced due to the uncertainty of altitude availability prior to departure**
- **Control strategies do not exist to resolve blocking conditions that create inefficiencies**
- **The net result of these factors may result in:**
  - Inefficient use of oceanic capacity
  - Excessive fuel usage
  - Fewer accepted pilot requests
  - Airline schedule disruptions

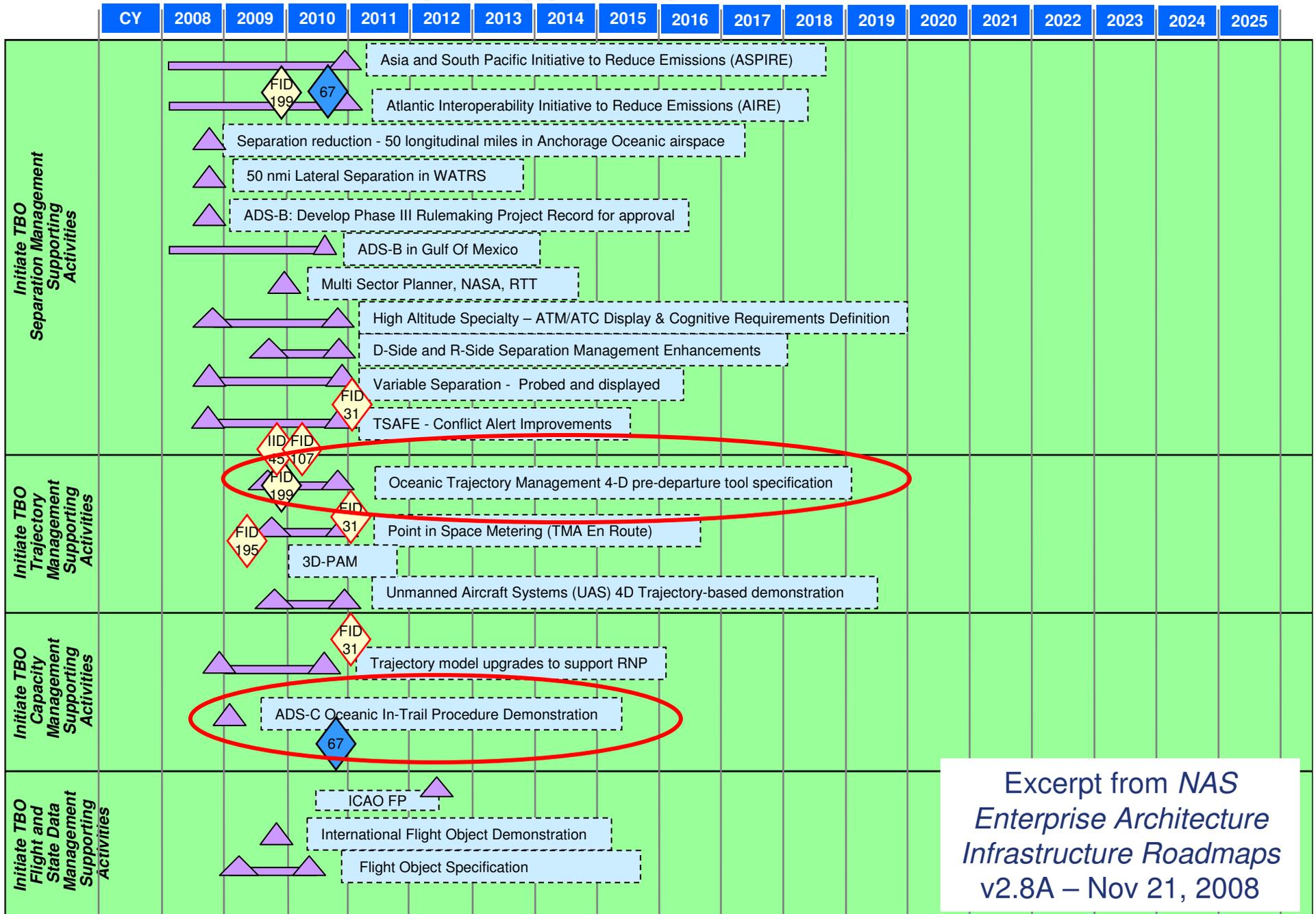


# Project Smartsheet – Solution

- **OTTM represents a shift from clearance-based control to trajectory-based management**
  - Via new decision support capabilities and integrated traffic flow management, aircraft will transmit and receive precise data including aircraft routes and key crossing points in the airspace
  - Via Data Communications, this precise information will also be available to pilots and controllers on the ground
- **FY 2009, \$5.6M is requested to address three activities:**
  - Automatic Dependent Surveillance - Contract (ADS-C) In-Trail Procedures (ITP)
    - Provides reduced separation standards for climb-through and descend-through
  - Web-enabled Collaborative Trajectory Planning (CTP)
    - Provides an information sharing capability for planning oceanic entry and optimized trajectories
  - Oceanic Trajectory Management-4D (OTM-4D)
    - Provides operators with an increased likelihood of more efficient step-climb profiles
    - Enables operators to fly closer to their optimal/requested trajectories by using optimization tools to identify beneficial profile changes



# Automation Roadmap: Supporting Activities—Initiate TBO (3 of 7)



Excerpt from NAS  
Enterprise Architecture  
Infrastructure Roadmaps  
v2.8A – Nov 21, 2008

# Project Smartsheet – Support to Goals

## Oceanic Tactical Trajectory Management (OTTM)

### Flight Plan Goal:

Greater Capacity: Work with local governments and airspace users to provide increased capacity in the United States airspace system that reduces congestion and meets projected demand in an environmentally sound manner

- **Objective:** Increase capacity to meet projected demand and reduce congestion
  - **Target:** Achieve an average daily airport capacity for the 35 OEP airports of 104,338 arrivals and departures per day by FY 2011 and maintain through FY 2012.

### SMP Goal:

#### Pathway 4 - Ensure Viable Future:

- **Objective 4.1:** Assure a sustainable and affordable Air Transportation System for the future
- This program supports the NextGen objective of increasing capacity through implementation of 4-D TBO and performance-based air traffic operations and services.



# Project Smartsheet – Interdependencies

## Oceanic Tactical Trajectory Management (OTTM)

- **ADS-C ITP Activity:**
  - Advanced Technologies and Oceanic Procedures (ATOP)
- **Web-enabled CTP Activity:**
  - Dynamic Ocean Track System Plus (DOTS+)
- **OTM-4D Activity:**
  - Advanced Technologies and Oceanic Procedures (ATOP)



# Project Schedule (FY 09)

## Oceanic Tactical Trajectory Management (OTTM)

FY09 Milestones and Deliverables	S	O	N	D	J	F	M	A	M	J	J	A	S
<b>Activity 1: ADS-C In Trail Procedures (ITP)</b>													
Milestone 1.1: ADS-C ITP Safety Analysis for Ops Trials					△								
Milestone 1.2: ADS-C ITP ICAO Petition Package for Ops Trials								△					
<b>Activity 2: Web-Enabled CTP</b>													
Milestone 2.1: Web-Enabled CTP Concept of Operations document										△			
<b>Activity 3: OTM-4D</b>													
Milestone 3.1: Pre-departure Concept of Operations document								△					
Milestone 3.2: Traffic Distribution Analysis													△



# Project Schedule (FY 10)

## Oceanic Tactical Trajectory Management

FY10 Milestones and Deliverables	S	O	N	D	J	F	M	A	M	J	J	A	S
<b>Activity 1: ADS-C In Trail Procedures (ITP)</b>													
Milestone 1.3: Initiate ADS-C ITP Ops Trials	△												△
Milestone 1.4: Collect and Analyze Ops Trials Data									△				
Milestone 1.5: Refined ADS-C ITP Benefit Analysis													△
<b>Activity 2: Web-Enabled CTP</b>													
Milestone 2.2: Initiate Web-Enabled CTP Ops Trial	△												△
Milestone 2.3: Collect and Analyze Ops Trials Data									△				
Milestone 2.4: Initial Web-Enabled CTP Benefits Analysis												△	
<b>Activity 3: OTM-4D</b>													
Milestone 3.3: OTM-4D Requirements Analysis						△							△
Milestone 3.4: OTM-4D Track Advisory Logic Development												△	
<b>Activity 4: Oceanic Airspace Management (OAM)</b>													
Milestone 4.1: Initial OAM Concept of Operations									△				



# Project Details – ADS-C ITP

- **Develop ADS-C In-Trail Procedures (ITP) for Operational Trials with existing FANS ADS technology**
  - Climb/descent to a requested Flight Level through one intermediate Flight Level occupied by a blocking aircraft
  - Based on existing ADS-C equipment and technology coupled with new ATC procedures
- **ADS-C ITP will have smaller longitudinal separation minima (e.g. 10-15 nm) than standard separation (e.g., 30 nm, 50 nm) with aircraft at intermediate flight levels**
- **ADS-C ITP is a controller initiated procedure implemented after a pilot request**



# Project Details – ADS-C ITP (cont'd)

- **Related Program/Integration/System Dependencies:**
  - Advanced Technologies and Oceanic Procedures (ATOP)
- **System Requirements:**
  - ADS-C ITP acceptance will generate new ATOP/Ocean 21 requirements
- **Other activities necessary to implement:**
  - Procedure Approval
  - Procedure Automation in ATOP/Ocean 21



# Project Details – Web-Enabled CTP

## Oceanic Tactical Trajectory Management (OTTM)

- **Leverage existing tools, or provide systems alternatives in the development of an online collaborative planning capability**
  - Dynamic Ocean Track System (DOTS) Plus
    - DOTS Plus provides wind optimized tracks and traffic planning
    - DOTS Plus Online (DPO) provides a web interface for airlines to DOTS Plus.
  - Develop a service for Web-enabled CTP
    - Provide DOTS Plus data to the end user
    - Provide capability to collect and utilize data from airlines
    - Allow flexible manipulation of the gateway reservation list
    - Allow for collaborative trajectory planning
- **Currently in the requirements definition phase for Web-Enabled CTP**
  - Requirements will become more refined as airlines gain experience with DOTS Plus Online and provide feedback



## Project Details – Web-Enabled CTP (cont'd)

- **Related Program/Integration/System Dependencies:**
  - Dynamic Ocean Track System Plus (DOTS+)
- **System Requirements:**
  - DOTS+ Online evaluation may generate new Web-Enabled CTP requirements
- **Other activities necessary to implement:**
  - Web-Enabled CTP requirements will need to be addressed in the Web-Enabled CTP tool
  - Successful Web-Enabled CTP Operational Trial

# Project Details – OTM-4D

## Oceanic Tactical Trajectory Management (OTTM)

- **Pre-Departure OTM-4D**

- Enhance flight profile by optimizing oceanic entry while considering planned step climbs beyond the oceanic entry point
- Currently developing initial Concept of Operations
- Perform Traffic Distribution Analysis to initiate prototype requirements development

- **In-Flight OTM-4D**

- Identify beneficial profile changes for individual aircraft pairs and traffic flows through optimization analysis tools
- Currently performing data analysis and applying lessons learned from AIRE-Oceanic demonstrations
- Perform Traffic Distribution Analysis to initiate prototype requirements development
- Develop metrics baseline



# Project Details – OTM-4D (cont'd)

## Oceanic Tactical Trajectory Management (OTTM)

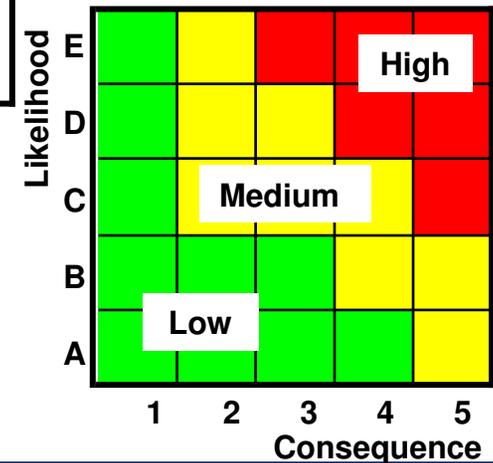
- **Related Program/Integration/System Dependencies:**
  - Advanced Technologies and Oceanic Procedures (ATOP)
- **System Requirements:**
  - OTM-4D development will generate new ATOP/Ocean 21 system requirements
- **Other activities necessary to implement:**
  - OTM-4D Automation in ATOP/Ocean 21



# Project Risks

## Oceanic Tactical Trajectory Management (OTTM)

Risk Level (T,S,C)	Description	Impacts	Mitigation Strategy
S- B3	ADS-C ITP Air Traffic Controller (ATC) acceptance	Delays ADS-C Ops Trials	Timely coordination with ATC and ATO-E SOS on procedures and potential benefits
S- C2	Delayed DOTS+ Online system deployment	Delays Web-Enabled CTP initiative	Collaboration with DOTS+ Program Office
T- B3	Obtain operational data for concept and requirement development	Delay in OTM-4D concept validation and requirement development	Collaborate with AIRE Program and airlines to define proper demo data set



# Resources

- **FAA Personnel**
  - FAA ATO-P Advanced Technology Development and Prototyping (ATD&P) Group
  - FAA ATO-P Concept Development Group
  - FAA ATO-E
    - Oceanic and Offshore Operations
    - Advanced Technologies and Oceanic Procedures (ATOP)
    - Dynamic Ocean Track System Plus (DOTS+)
  - FAA International Office
  - FAA Environmental Office
  - William J. Hughes Technical Center (WJHTC)
- **Other Government Personnel**
  - None
- **Contract Personnel**
  - MITRE/CAASD
  - The Boeing Corporation
  - CSSI
  - Veracity Engineering
  - MCR
- **Challenges**
  - None



# Acquisition Status / Requirements

## Oceanic Tactical Trajectory Management (OTTM)

- **Existing Contracts/Agreements**
  - **Global Air Traffic Interoperability (GATI) Agreement**
    - Support Contractor: Boeing
    - Contracting Officer: Dennis Scanlon; COTR: James McDaniel
    - Period of Performance: 6/30/2010
  - **CAASD Industrial Work Contract**
    - Support Contractor: MITRE/CAASD
    - Contracting Officer: Barbara Kates; COTR: Bob Bostiga
    - Period of Performance:
  - **REAPS Technical Directive Memorandum**
    - Support Contractor: CSSI
    - Contracting Officer: Barbara Kates; COTR: Debbie Frye
    - Period of Performance:
  - **Future Surveillance Development (FSD) Contract**
    - Support Contractor: Veracity Engineering
    - Contracting Officer: Stephen Bobby; COTR: Neil Suchy
    - Period of Performance: 9/19/2011
  - **Financial Support (MCR) Contract**
    - Support Contractor: MCR
    - Contracting Officer: Stephen Bobby; COTR: Robert Smith
    - Period of Performance: Jan 2012
- **No New Contract Requirements (use existing contracts/agreements for FY09)**
  - GATI Agreement
  - CAASD Industrial Work Contract
  - REAPS Technical Directive Memorandum
  - Future Surveillance Development (FSD) Contract
  - Financial Support (MCR) Contract
  - WJHTC Technical Center
- **Other Agreements – N/A**



# FY '09 NextGen Implementation Plan Commitments (PLA Milestones)

## Oceanic Tactical Trajectory Management (OTTM)

- **FY '09 Major Milestones to be reported in the NextGen Implementation Plan**
  - Develop Initial Mid-Term In-Flight OTM-4D Research and Development Roadmap for NextGen Capabilities
- **FY '09 NASEA Decisions supported**
  - TBO – Oceanic Tactical Trajectory Management is part of the NAS Enterprise Architecture (See Automation Roadmap on pg. 7)
- **FY '09 Deliverables/Products**
  - ADS-C ITP ICAO Petition Package for Operational Trials
  - Web-Enabled CTP Concept of Operations document
  - Pre-departure OTM-4D Concept of Operations document

*NextGen... Integrating Ideas, Systems and Solutions*

