

NextGen Trajectory Based Operations TBO Solution Set



Federal Aviation
Administration

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Presented by:

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Solution Set Coordinator



Agenda

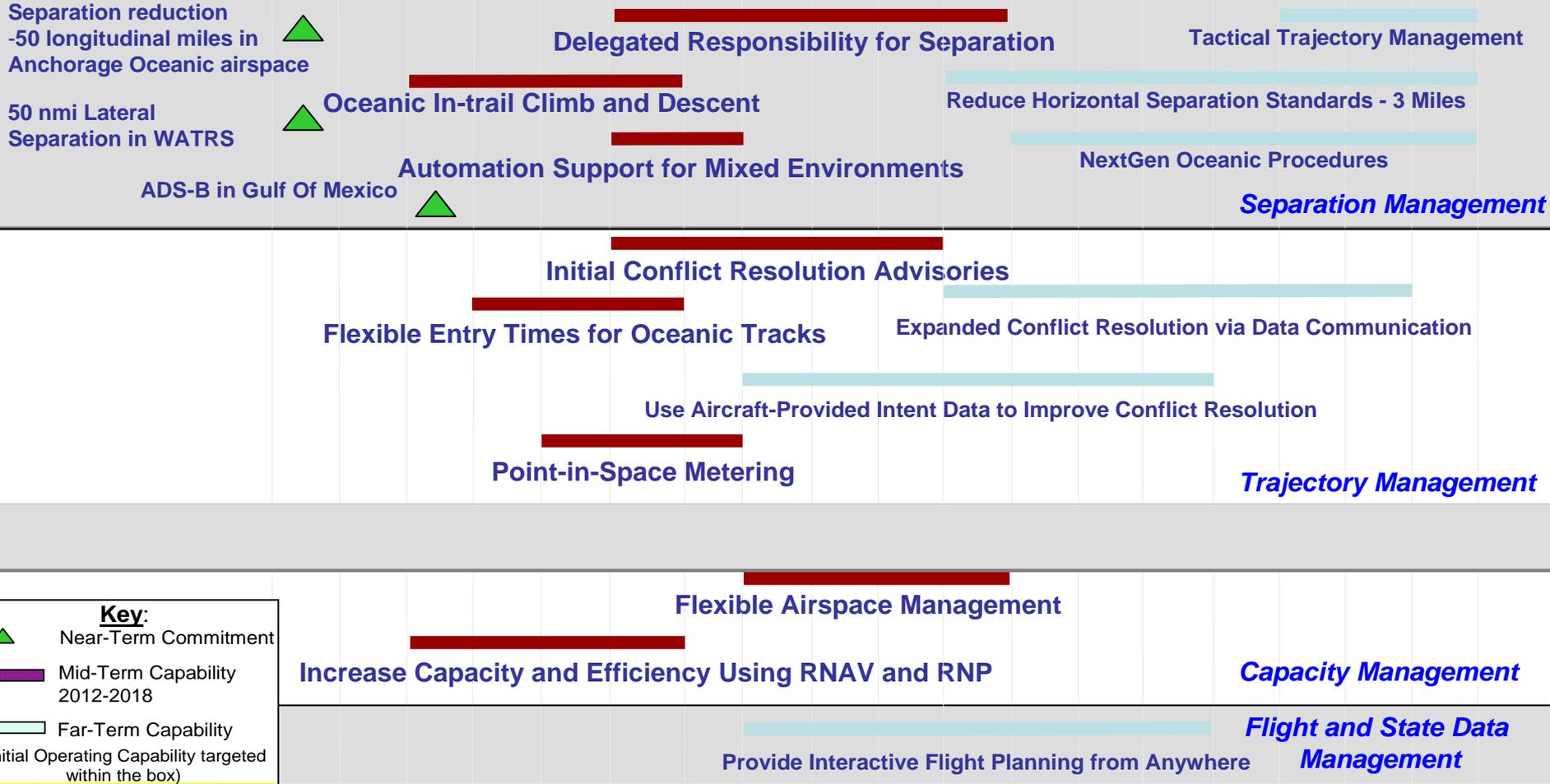
- Trajectory Base Operations
- Operational Improvements
- FY09 Budget TBO context chart
- Summary of TBO Projects for FY09
- Linkage between Capabilities and Systems

Trajectory Based Operations

- Air Traffic Control transitions to *traffic management by trajectory*.
- Aircraft will fly negotiated trajectories and air traffic control moves to trajectory management. The roles of pilots/controllers will evolve to support the requirements.
- System enhancements support traffic management *improvements in airspace with mixed equipage aircraft operations*.
- The focus of TBO Solution Set is primarily en route cruise.
- Goals:
 - Gate to Gate
 - Safe and Efficient Separation Management
 - Management of Trajectories

Trajectory Based Operations Operational Improvements

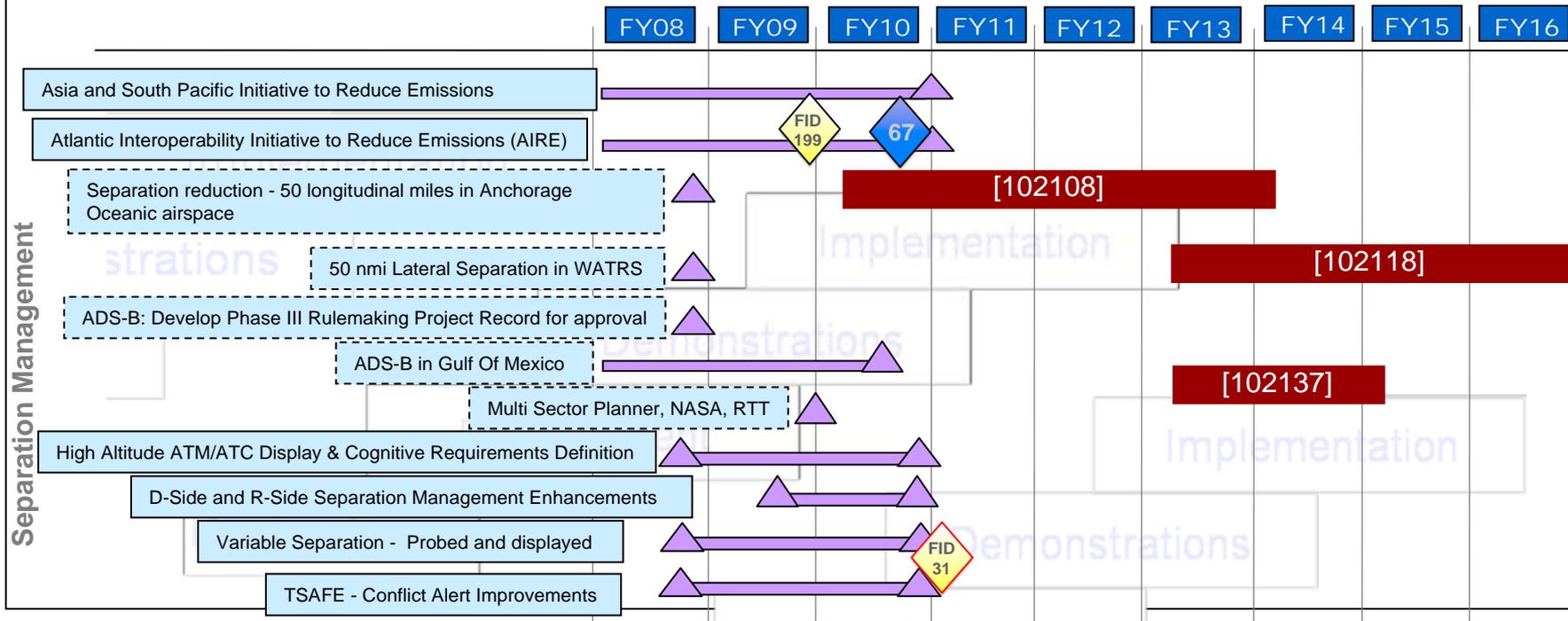
FY 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2025



Key:

- Near-Term Commitment
- Mid-Term Capability 2012-2018
- Far-Term Capability (Initial Operating Capability targeted within the box)

Trajectory Based Operations - Mid Term Automation Roadmap to Improvements

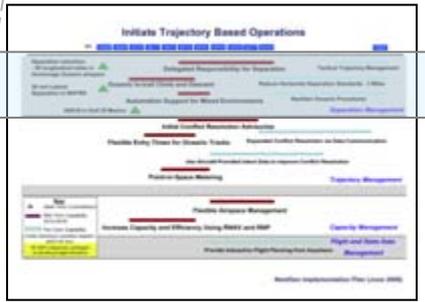


Capability Description

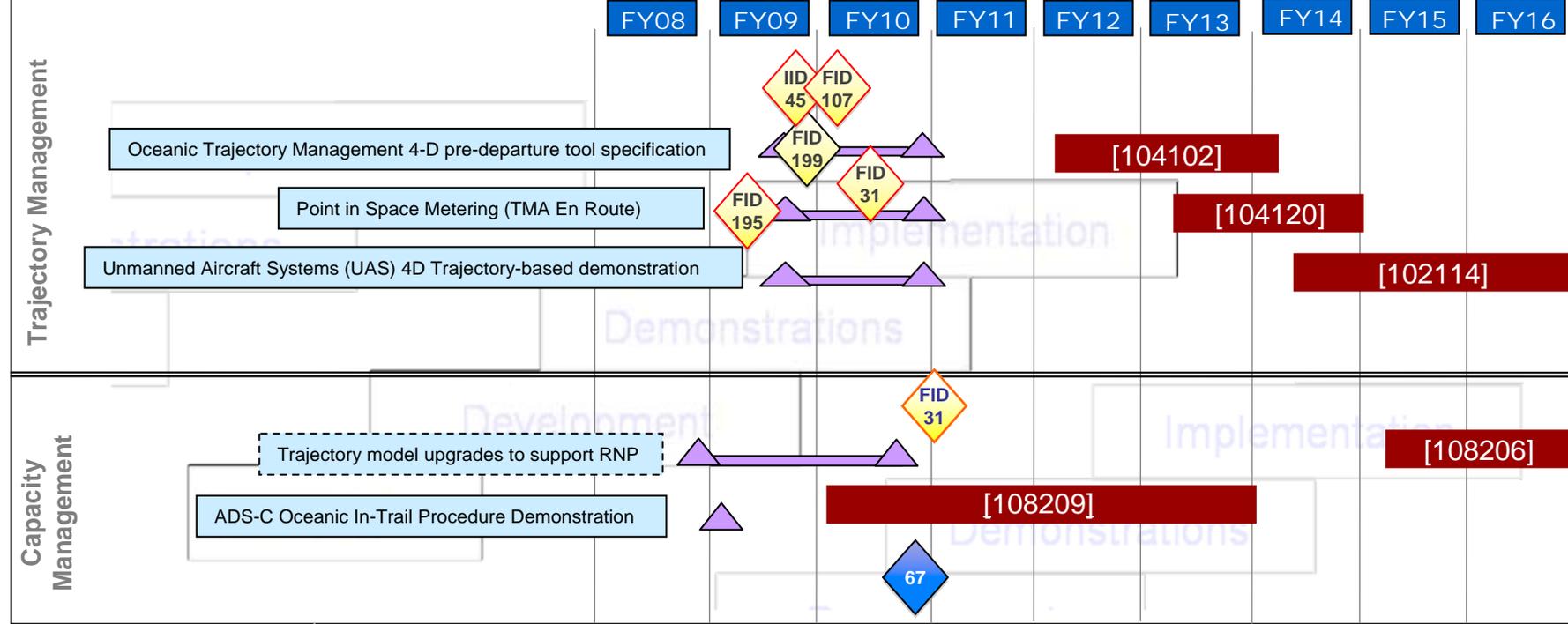
102108 - Oceanic In-trail Climb and Descent – ANSP automation enhancements will take advantage of improved communication, navigation, and surveillance coverage in the oceanic domain. When authorized by the controller, pilots of equipped aircraft use established procedures for climbs and descents.

102118 – Delegated Responsibility for 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 situation awareness to the flight deck. When authorized by the controller, pilots will implement delegated separation between equipment aircraft using established procedures.

102137 – Automation Support for Mixed Environments – The ANSP automation provides the controller with tools to manage aircraft in a mixed navigation and wake performance environment.



Trajectory Based Operations - Mid Term Automation Roadmap to Improvements



Capability Description

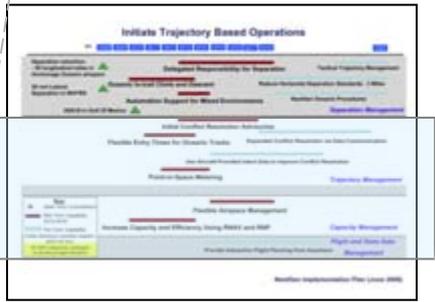
104102 - Flexible Entry Times for Oceanic Tracks – Flexible entry times into oceanic tracks or flows will allow greater use of user-preferred trajectories.

104120 – Point in Space Metering – ANSP uses scheduling tools and trajectory-based operations to assure a smooth flow of traffic and increase the efficient use of airspace.

102114 – Initial Conflict Resolution Advisories – The ANSP conflict probe is enhanced to not only recognize conflicts but to provide rank-ordered resolution advisories to the provider, who may select one of the resolutions to issue to the aircraft. Automation enables ANSP to better accommodate pilot requests for trajectory changes by providing conflict detection, trial flight planning, and development of resolutions and an optimal ranking of resolutions.

108206 - Flexible Airspace Management – ANSP automation supports reallocation of trajectory information, surveillance, communications, and display information to different positions or different facilities.

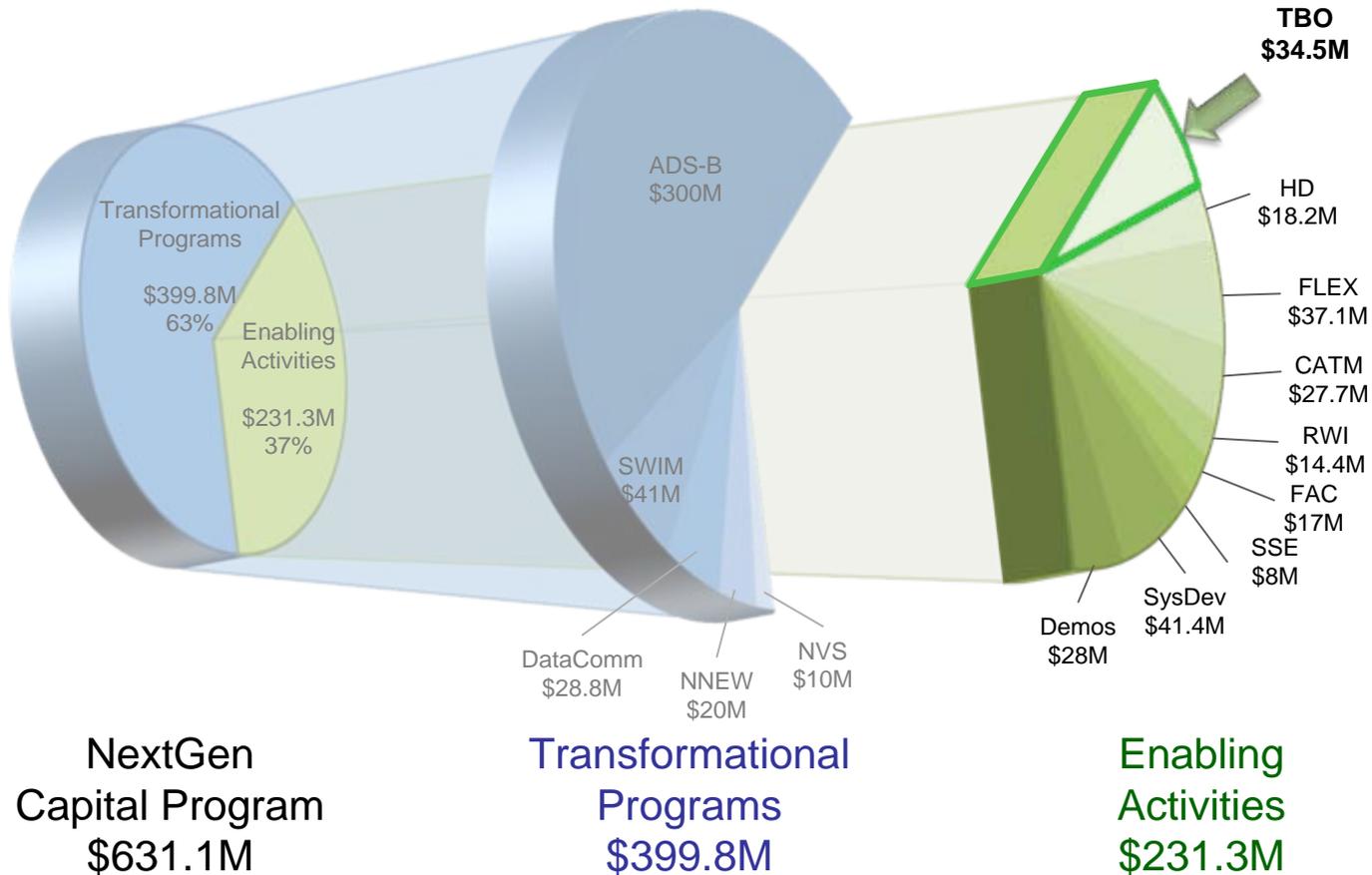
108209 – Increase Capacity and Efficiency Using RNAV and RNP - Both Area Navigation (RNAV) and Required Navigational Performance (RNP) enable more efficient aircraft trajectories. RNAV and RNP combined with airspace changes, increase airspace efficiency and capacity.



NextGen Mid-Term

Trajectory Based Operations (TBO) Budget Context

NextGen Investment Portfolio Summary
FY09 Request



Summary of TBO Projects for FY09

FY09

Pre-Implementation

- Modern Procedures – Separation Automation Enhancement (D and R Sides) [1A09A]
Craig Marina ATO-E
- High Altitude Specialty [1A09B]
Michele Merkle ATO-P
- En Route Point-In-Space Metering [1A09C]
Midory Tanino ATO-R
- Oceanic [1A09D]
Thien Ngo ATO-P

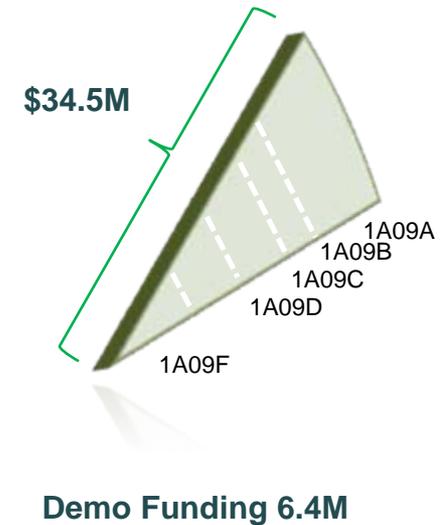
Implementation

- Modern Procedures – Separation Automation Enhancement (D and R Sides) [1A09A]
Craig Marina ATO-E
- NextGen Distance Measuring Equipment [1A09F]
Stephen Burnley ATO-W

Demo

- International Air Traffic Interoperability (Demo Funding) [1A07A]
Jim McDaniel ATO-P

FY09 Funding



NextGen Integration Matrix

Linkage between Capabilities and Systems

	ADS-B	DataComm	NNEW	NVS	SWIM	ERAM	TFMS	ASDE-X	LAAS	RNP	RNAV	AIM	TBFM	CATMT	Procedures
TRAJECTORY BASED OPS															
MID-TERM															
Delegated Responsibility for Separation	X					X									X
Oceanic In-Trail Climb and Descent		X								X	X				X
Automation Support for Mixed Environment						X									
Initial Conflict Resolution Advisories		X				X									
Flexible Entry Times for Oceanic tracks			X												
Point in Space Metering						X	X						X		
Flexible Airspace Management			X	X	X	X	X								X
Increase Capacity and Efficiency Using RNAV and RNP						X				X	X			X	X
Provide Interactive Flight Planning from Anywhere		X			X	X	X					X			