

Overview of JPDO and the Weather IPT



Mark Andrews
Weather IPT Lead
Mark.Andrews@faa.gov

July 13th, 2006



Welcome!

- Overview of Weather Integrated Product Team (IPT)
 - Where are we at?
 - What are the plans for the future?
 - What are the IPT's deliverables?
- Relationship to NGATS Concept of Operations
- More time spent today on discussion instead of briefings



Aviation Weather History and Current State

- Safety – has been the driving force behind aviation weather
- 80's and 90's were renaissance era for advancing the state of the art in aviation weather from safety perspective
 - Dramatic decline in weather related aviation fatalities have resulted from
 - Improved detection and forecast of hazardous weather
 - Real-time broadcast of local conditions
 - Exploitation of satellite and NEXRAD imagery
 - Deployment of warning systems like LLWAS, TDWR
 - Better understanding of in-flight icing, how to predict it, and how to detect it
- 80's and 90's also saw dramatic increases in summertime delays due to weather as air traffic levels rose pointing to deficiencies in the FAA's aviation weather R&D and F&E portfolios and management structure
- An independent study in 1995 by the National Research Council principally concluded:
 - Weather in FAA is fragmented and is in need of a focal point
- Despite creation of a weather focal point in former Air Traffic Organization, today the aviation weather remains fragmented in the FAA
- **Bottom line: The NAS as a result of past aviation weather research and system development has become much safer, however there has not been a noticeable improvement in weather impacted capacity**



Weather IPT Background

- JPDO Weather Group – started in 2003
 - Core group of 20+ experts from Government and industry worked on the early NGATS weather vision
- In 2005 the early group formed the Weather IPT bolstered by 130+ more sub-team participants on a part-time and voluntary basis
- Rationale for Weather IPT is two-fold
 - Create a true multi-agency national plan for aviation weather – mitigate the fragmentation and “stove-piping” of aviation weather programs across federal agencies
 - Develop, promote, and implement NGATS weather vision

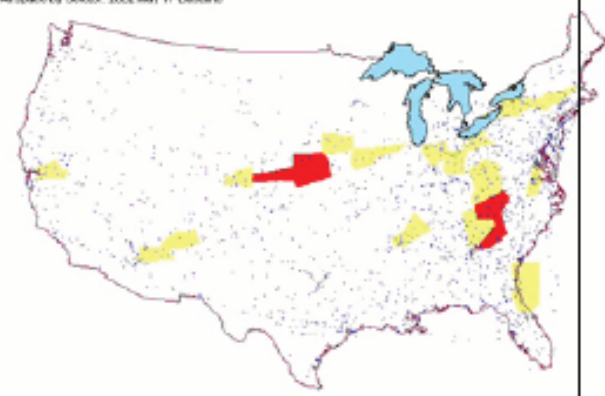


Airspace Loading: Mid-Day EST Demand for Airspace

Snapshot at ~1pm EDT

Baseline Demand (2002)

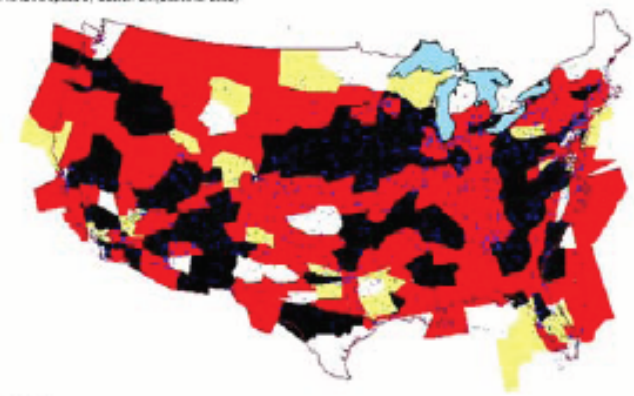
Demand for NAS Airspace by Sector: 2002 May 17 Baseline



10-01
 Active Flights : 2289

Future 2X Demand

Demand for NAS Airspace by Sector: 2X (Baseline: 2002)



10-01
 Active Flights : 5034

Sector Color Loading index:

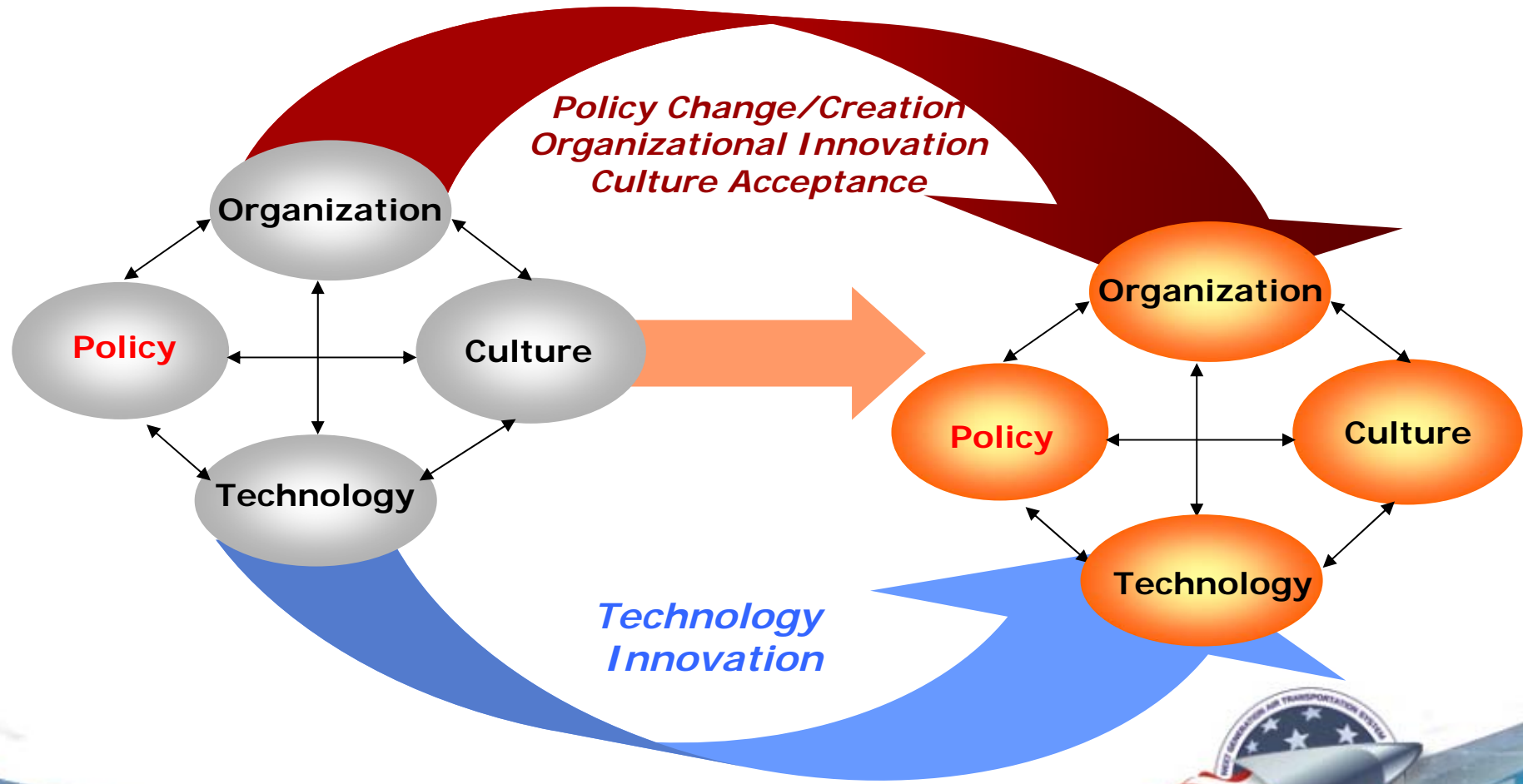
VAMS ACES Simulation B 2.0.3
 Unconstrained Airports & Airspace
 250 Airports, 24 hour simulation
 Future growth based on Terminal Area
 Forecast (TAF)

 2002: ~27K flights total
 Future 2X: ~54K flights total



Yellow: 80 – 125% of sector capacity
Red: 125 - 200% of sector capacity
Black: > 200% of sector capacity

System-Wide Transformation Requires Innovation Across All Lines of Development



Integrated National Plan



- Established National Goals
- Set context for Transformation
- Set direction for Transformation (8 Transformational Strategies)
- Created governance model for multi-agency cooperation
- Delivered to Congress in December, 2004



Key FY06 JPDO Products

("Expert" and Architecture Based)

- NGATS Vision (2025 Concept)
- Capabilities and Outcomes

- | | |
|--|---|
| <ul style="list-style-type: none">• Early opportunities (FY07*)• Agency guidance (FY08*): implementation & research• Segment portfolio (FY08-12*) with consolidated business case• 2025 benefits assessment*• Demonstrations (e.g. NEO*) | <ul style="list-style-type: none">• Concepts of Use• Concept of Operations• Enterprise Architecture<ul style="list-style-type: none">– 2025 and intermediate architecture versions– "Executable architecture" (models and simulations) for evaluation and analysis |
|--|---|

- Policy formulation and advocacy
- Progress tracked towards NGATS goals and objectives
- Progress report to Congress

* Denotes "Expert" Based



NGATS Weather Vision

- NGATS considerations:
 - Migration to a highly automated environment (M2M)
 - NGATS “evaluator”
- Common Weather Situational Awareness
 - Capitalize on Network Enabled Operations concept
 - “Single authoritative” source for NGATS decisions
- Make weather “transparent”
 - Information becomes the “product”
 - No stand alone weather systems
 - Weather is fully integrated into decision cycles



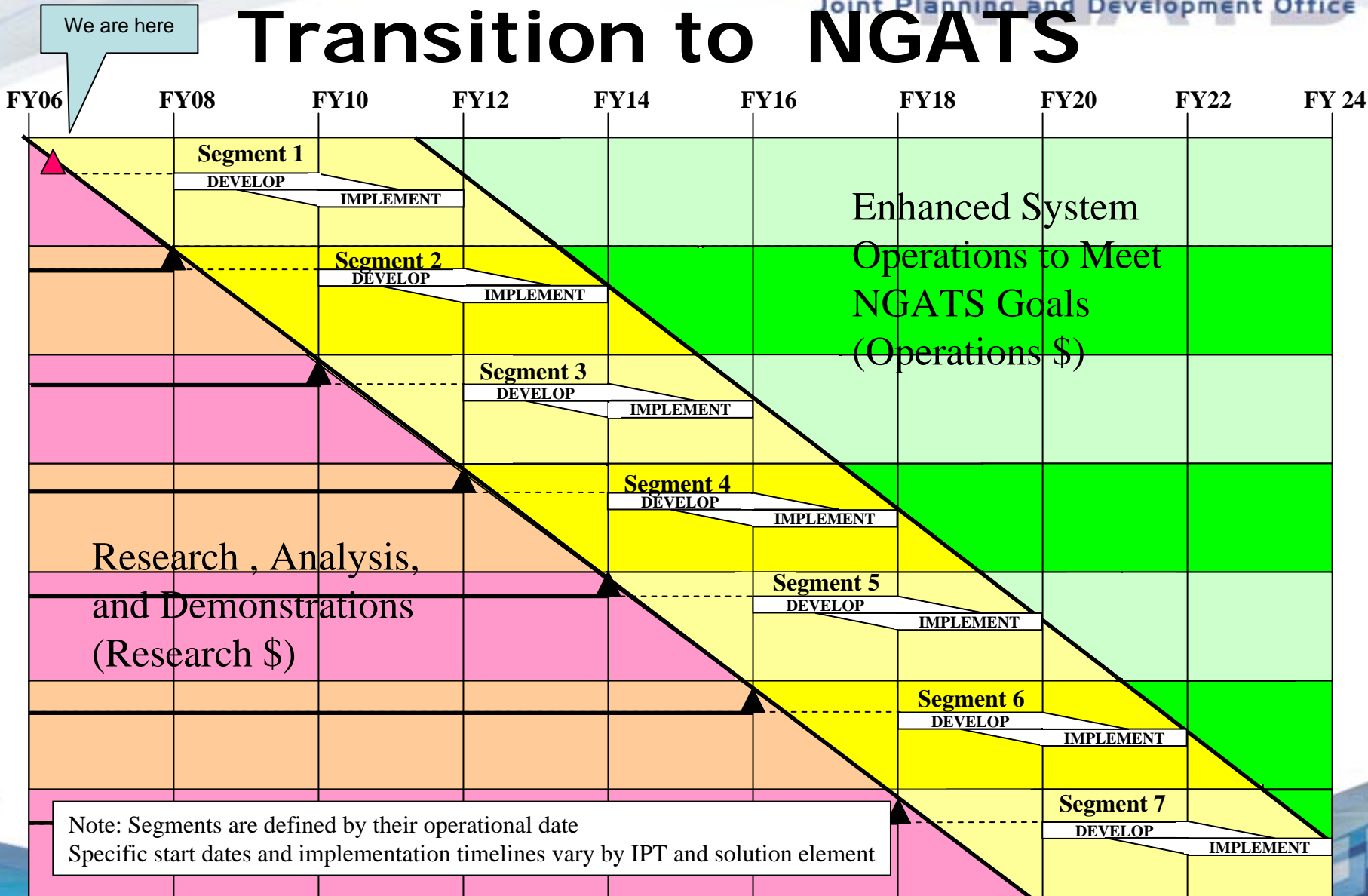
Pursuing Early Opportunities

- **JPDO identified five key areas for Early Opportunities for alignment**
 - Jump start ADS-B
 - Jump start net enabled information access
 - Synchronize weather research and accelerate development
 - Define Required Total System Performance (RTSP) levels of service
 - Initiate Aircraft Trajectory-Based Operations Research

- **In two key areas, we have achieved greater alignment than originally anticipated**
 - FAA – Alignment of architecture and roadmaps that drive capital investment (F&E)
 - NASA – Alignment of Aeronautics Research Program to NGATS research needs



Transition to NGATS



DRAFT FY08 Implementation Guidance

- Define NEO architecture, policies and requirements
- Deploy Automatic Dependant Surveillance–Broadcast (ADS-B)
- ATC data communication system engineering
- RNP/RNAV at all OEP airports
- Publish Performance-Based Rules
- Implement Passenger & employee pre-screening and credentialing
- Determine Secondary navigation system(s)
- 4D trajectory-based flight plan filing
- Non-visual operation procedures for CDTI
- Tools for safety information via NEO



DRAFT FY08 Research Guidance

- Network architecture alternatives
- RTSP levels of service
- Common Weather database and NEO dissemination
- Unobtrusive Security Screening
- Precision landing requirements
- 4D trajectory management methods
- “Equivalent–Visual” operations
- Real-time wake vortex detection
- Environmental technologies
- Humans and automation

