Joint Planning and Development Office (JPDO) Weather Integrated Product Team (IPT)

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What is this all about?

- An opportunity we can't afford to pass up
  - Perhaps the first time since FAA stood up to totally resynchronize aviation weather services (government and industry)
  - Buy-in from senior leadership across both government and industry
- Making tough decisions
  - Transformation, not evolution
    - Human versus automation
    - Government and industry roles/costs
  - Eliminate the "not invented here" philosophy
    - Shared input/consensus where possible
  - 2025 system--yes
    - But begin to impact FY06 activities

Weather IPT History

- Started September 2003
- Membership primarily government, but expected to change
- Work to date has been taken “out of hide”
- **Recognition for team members**

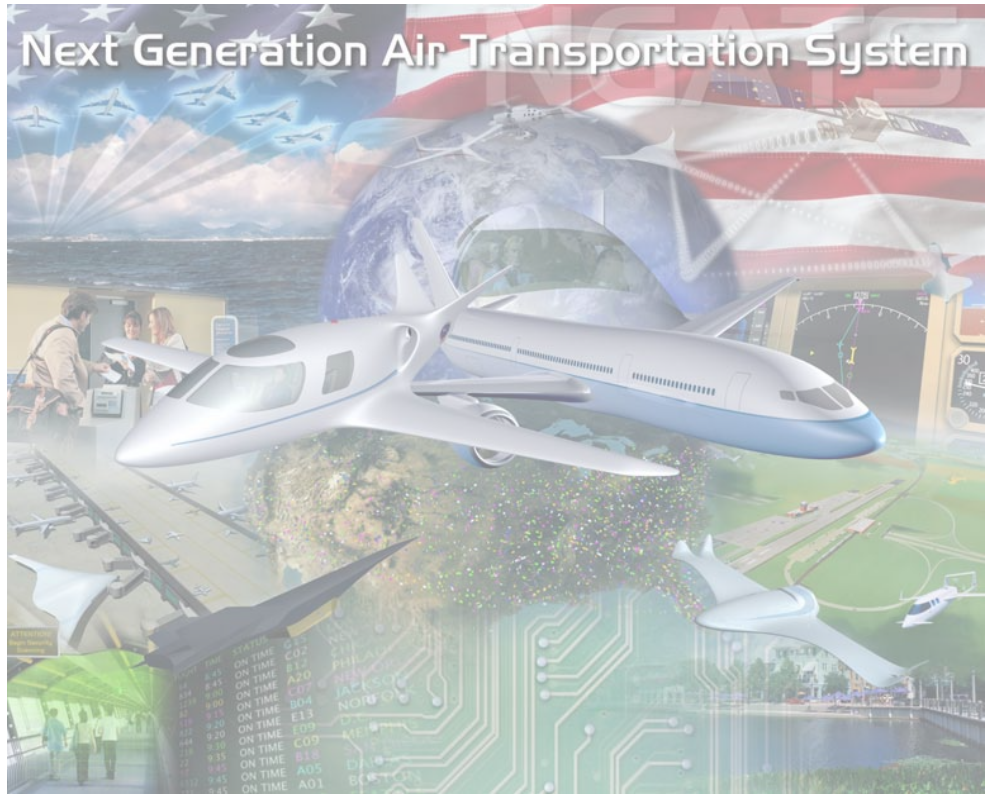
2025 NGATS Concept

Operating Principles

- "It's about the users…"
- System-wide transformation
- Prognostic approach to safety assessment
- Globally harmonized
- Environmentally compatible to foster continued growth

Key Capabilities

- Net-Enabled Information Access
- Performance-Based Services
- Weather-Assimilated Decision Making
- Layered, Adaptive Security
- Broad-Area Precision Navigation
- Trajectory-Based Aircraft Operations
- "Equivalent Visual" Operations
- "Super Density" Operations



"It's about the Users"

A major shift in the information paradigm…

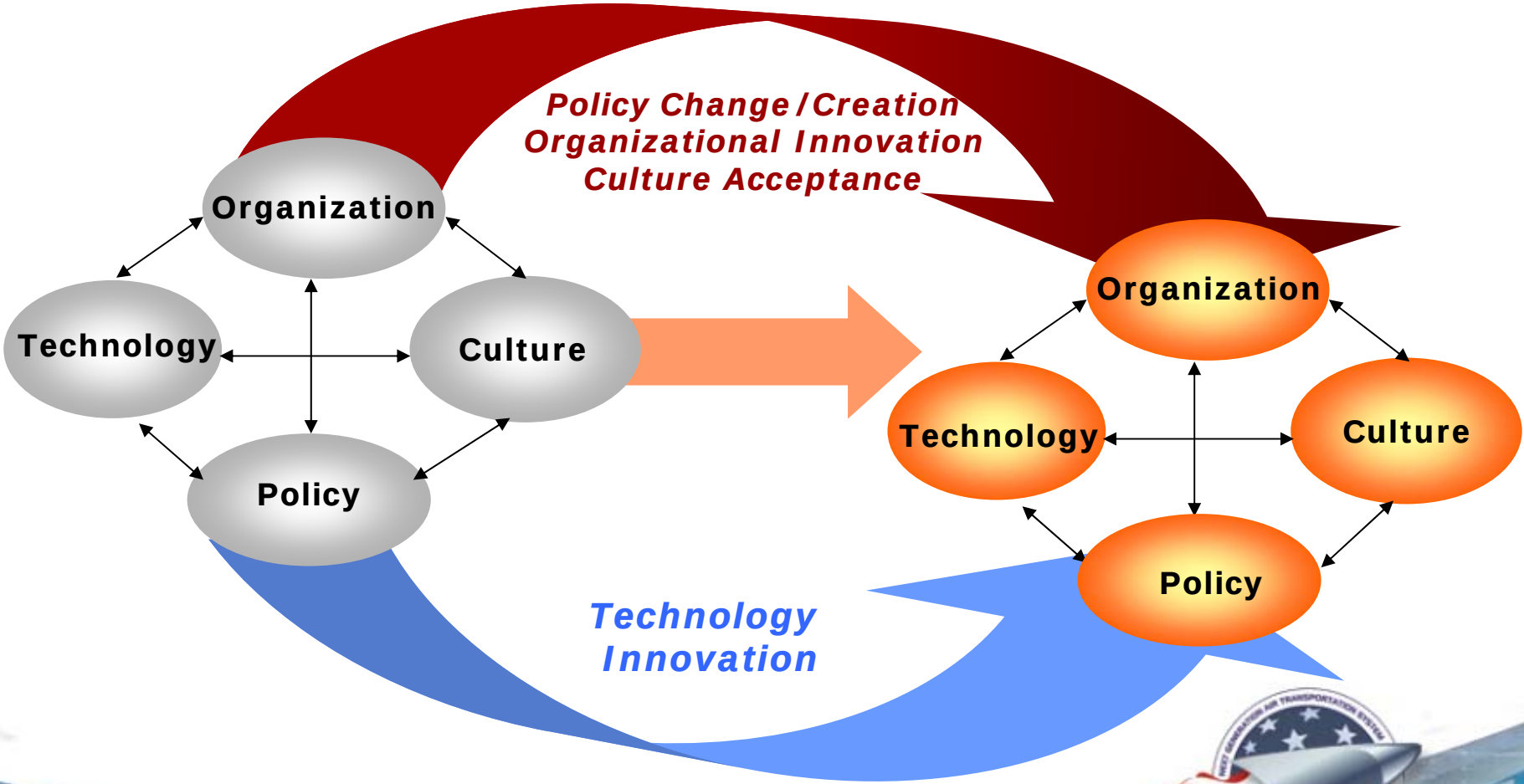
From	***To***
• Supplier dominated	• User (consumer) dominated
• Owner pushes controlled info	• Owner posts info for appropriate classes of users
• Sequential info flow	• Parallel information flow
Gather, Process, Use, Disseminate	Gather, Post, Process, Use

Payoffs

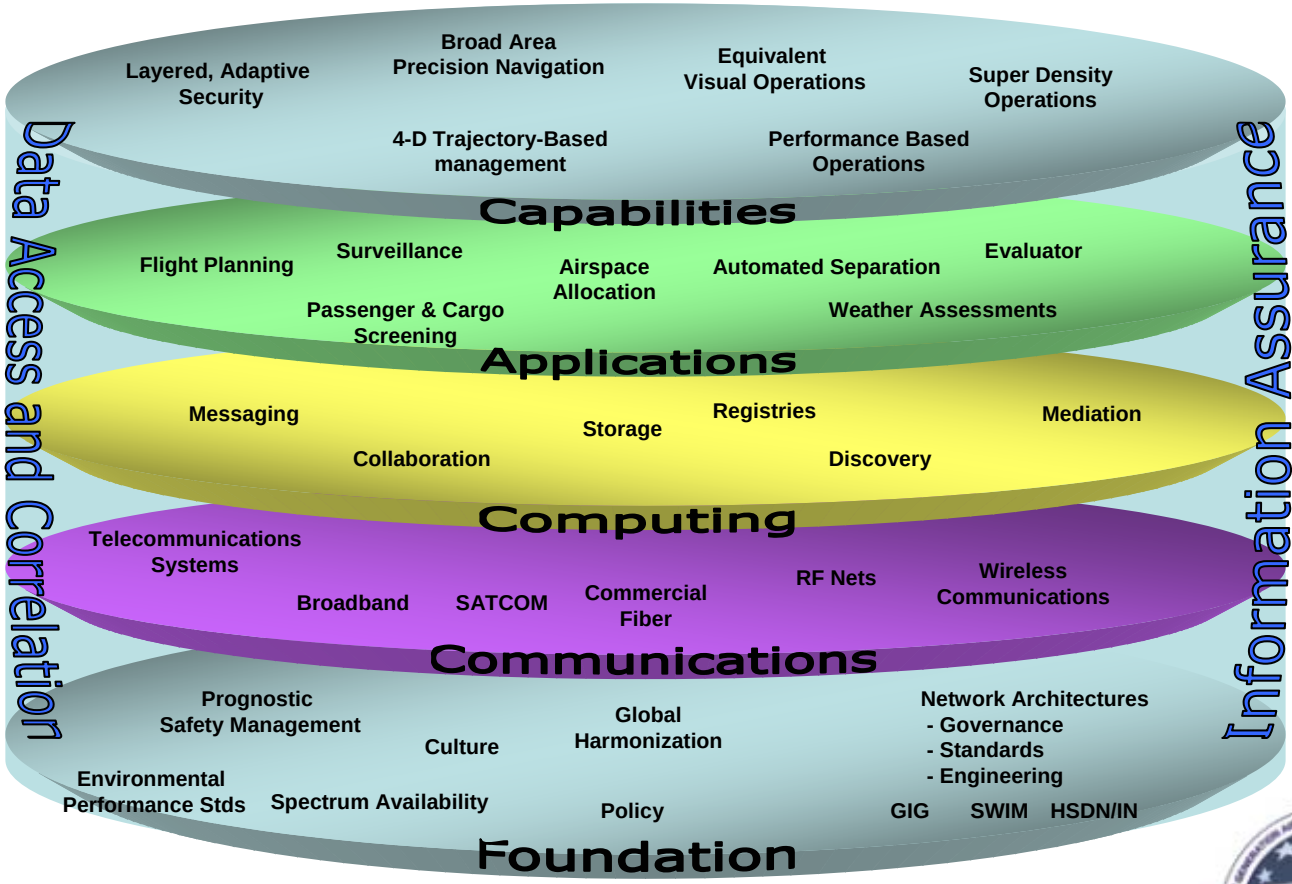
- *Better, Faster Decision Making (due to greater information base)*
- *Increased Collaboration, Reliability & Accuracy*
- *Greater Security*

System-Wide Transformation

Innovation Across All Lines of Development

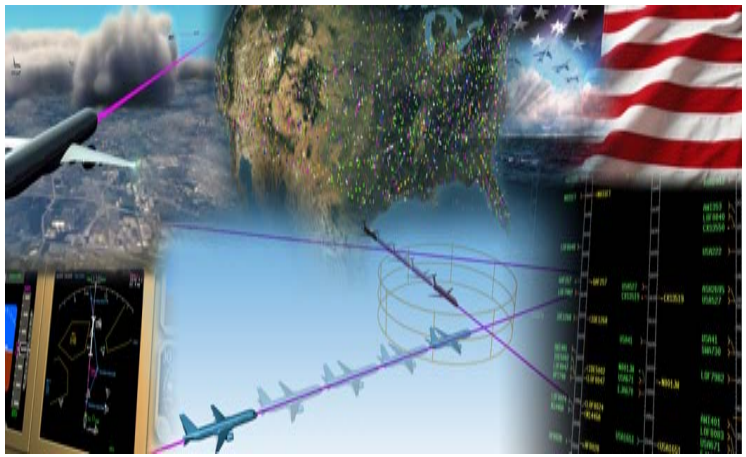


Information Sharing: Foundation to Capabilities



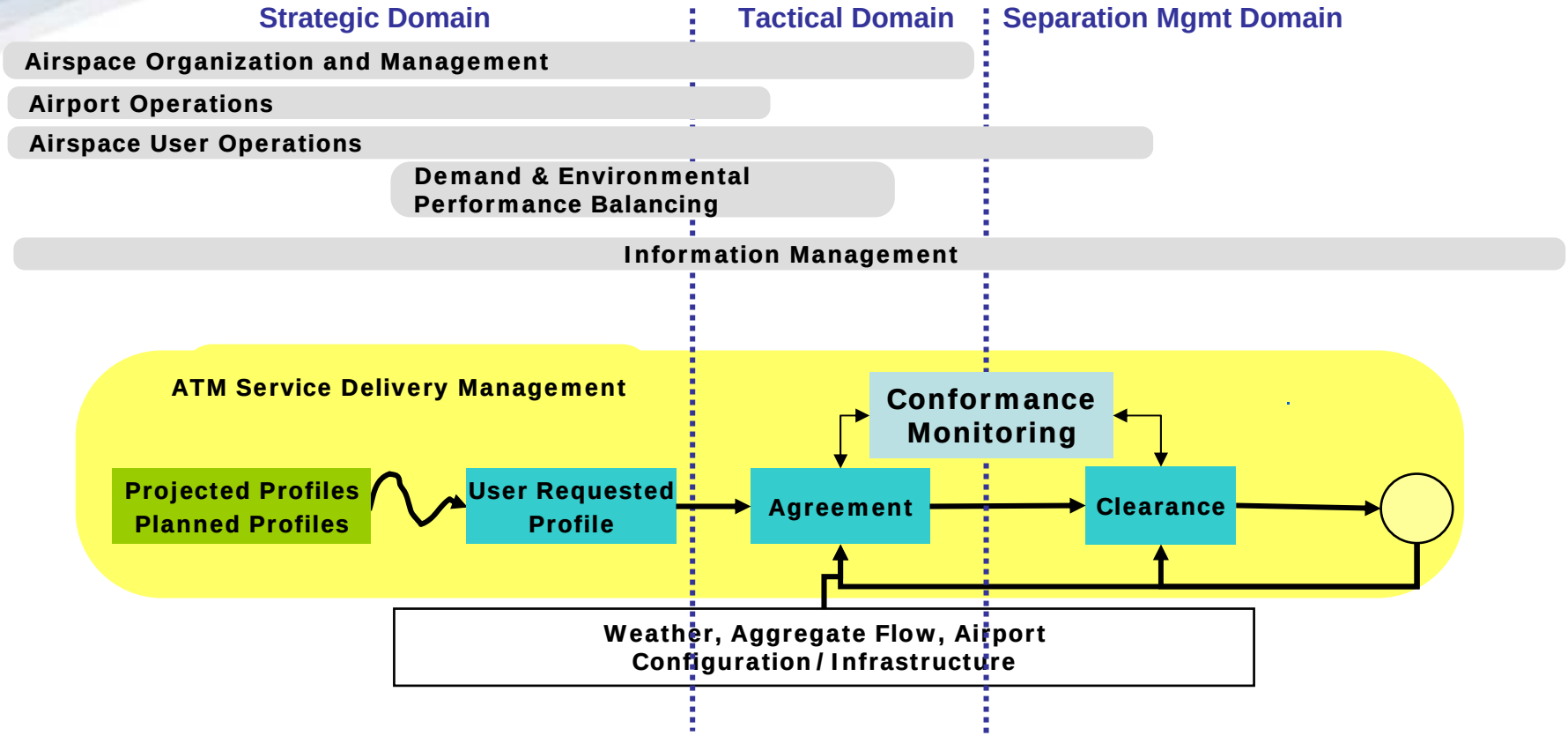
Aircraft Trajectory-Based Operations

Adjust airspace configuration to meet user needs



- 4D trajectories (including taxi and roll-out) are basis for planning and execution
- Machine-based trajectory analysis and separation assurance
- Includes environmental performance throughout all phases of aircraft operations
- Airspace configuration driven by: DoD/DHS requirements, domestic & international user needs, requirements for special-use airspace, safety, environment, overall efficiency
- Airspace reconfigurable during day of operations
- Users “contract” for airspace access and service

Aircraft Trajectory-Based Operations: *Management-by-Trajectory*



Key Issues are functional allocation between:

- Automation and humans
- Aircraft operators and service provider

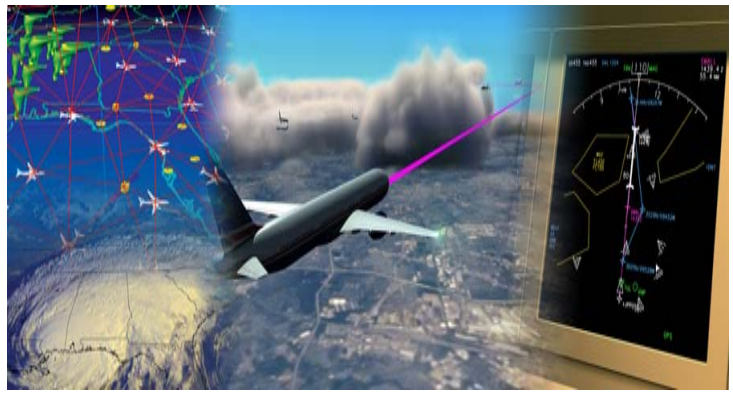
Aircraft Trajectory-Based Operations: *"Evaluator"*

- Integrates/communicates weather, security, defense, environmental, safety, international considerations, other information
- Users "post"/update desired 4D trajectories in common system that continuously evaluates mutual compatibility
- Predicts potential "over demand" situations, in multiple "capacity dimensions"—traffic density, environmental, security, etc.
- Works across all time horizons from days/weeks/months prior to flight up to separation management (20 minutes or less)
- Supports distributed decision-making environment where players have clear, agreed-upon roles and interactions

Weather Assimilated into Decisions

Common weather picture across NGATS

- **Fuse global weather observations and forecasts into single information system, dynamically update as needed**
  - **Tens of 1000's of sensors (airborne & ground) feed 100's of forecast models**
- **Learning automation accounts for weather and its uncertainties in managing aircraft trajectories**
- **Identify hazardous weather real-time**
- **Assimilated into NGATS "decision loops"**
  - **Total integration via machine-to-machine**
  - **Critical decision system time scales using both probabilistic and deterministic weather info**
  - **Optimized to maximize available weather-favorable airspace**
  - **Terminal weather impacts including ground/ramp ops and adaptability due to wind shift changes**



Conclusion

- JPDO weather IPT is badgeless (for now)
  - Not easy, but essential
- We're reinvigorating and updating an "old" concept of operations
  - Intend to see it through
- We're working closely with other IPTs to ensure weather does not again become a stovepipe
  - Likely to cause significant change to existing government weather programs
- Challenge the concepts you see today