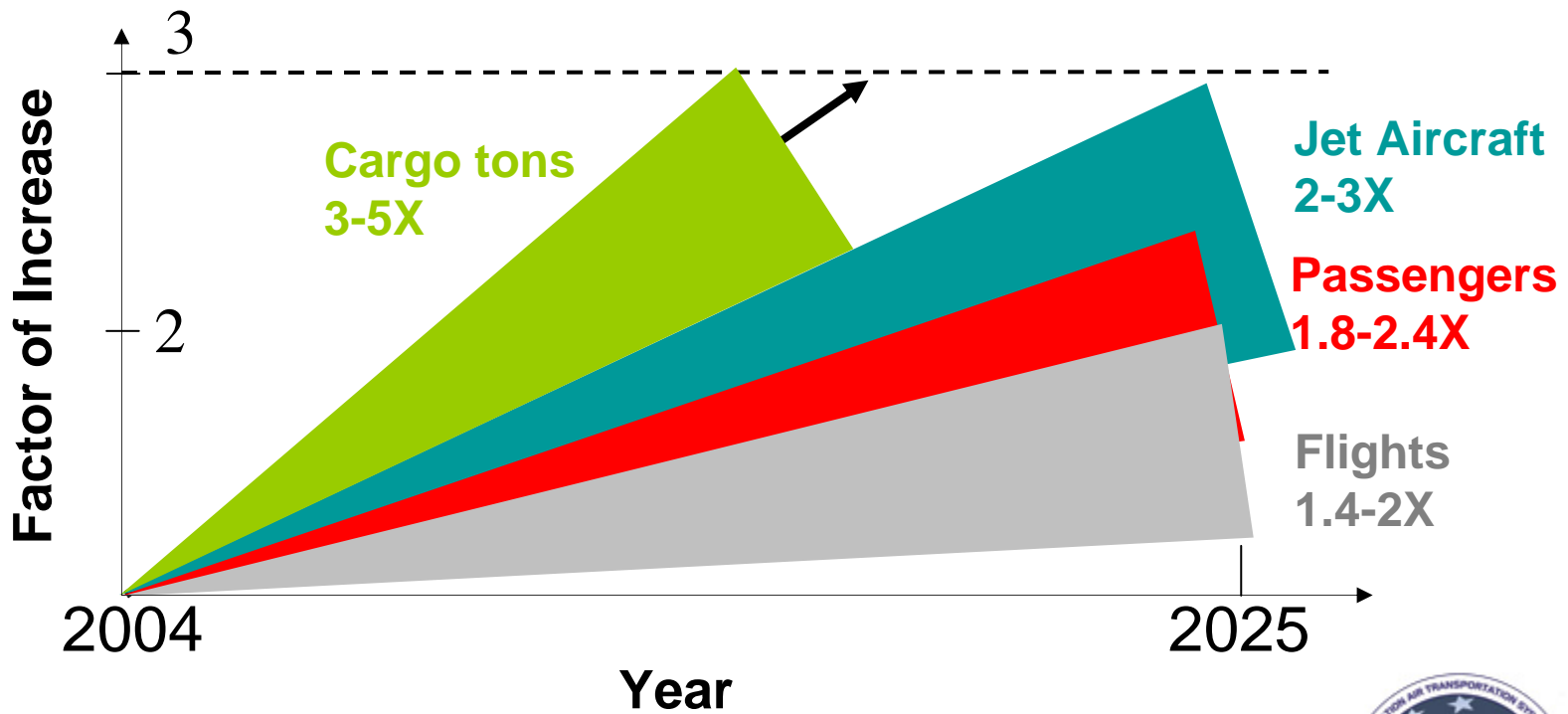# *Shared Situational Awareness -*
A Vital Element to Next Generation Aviation Security

C. Vanessa Fong

Counterterrorism For Transportation Conference

The Coordination and Integration of Human, Technical and Machines Intelligence for

Air, Land, and Sea

2nd March, 2007

# Walker Commission on the Future of the U.S. Aerospace Industry, 2002

- **Transform the U.S. air transportation system to meet civil aviation, national defense, and homeland security needs … a national priority.**

- **The Administration should establish a Next Generation Air Transportation System Office that brings together the FAA, NASA, DoD, DHS, NOAA and others.**

- **Within a year, present a plan to the Administration and the Congress outlining the overall strategy, schedule, and resources needed to deploy the NGATS.**

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Joint Planning and Development Office (JPDO)

Public Law 108 - 176
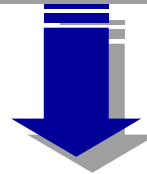
Develop and Guide the Collaborative Planning Efforts of DOT, DOD, DOT/FAA, DOC, DHS, NASA, and White House OST to Develop the Next Generation Air Transportation System NextGen (aka NGATS)
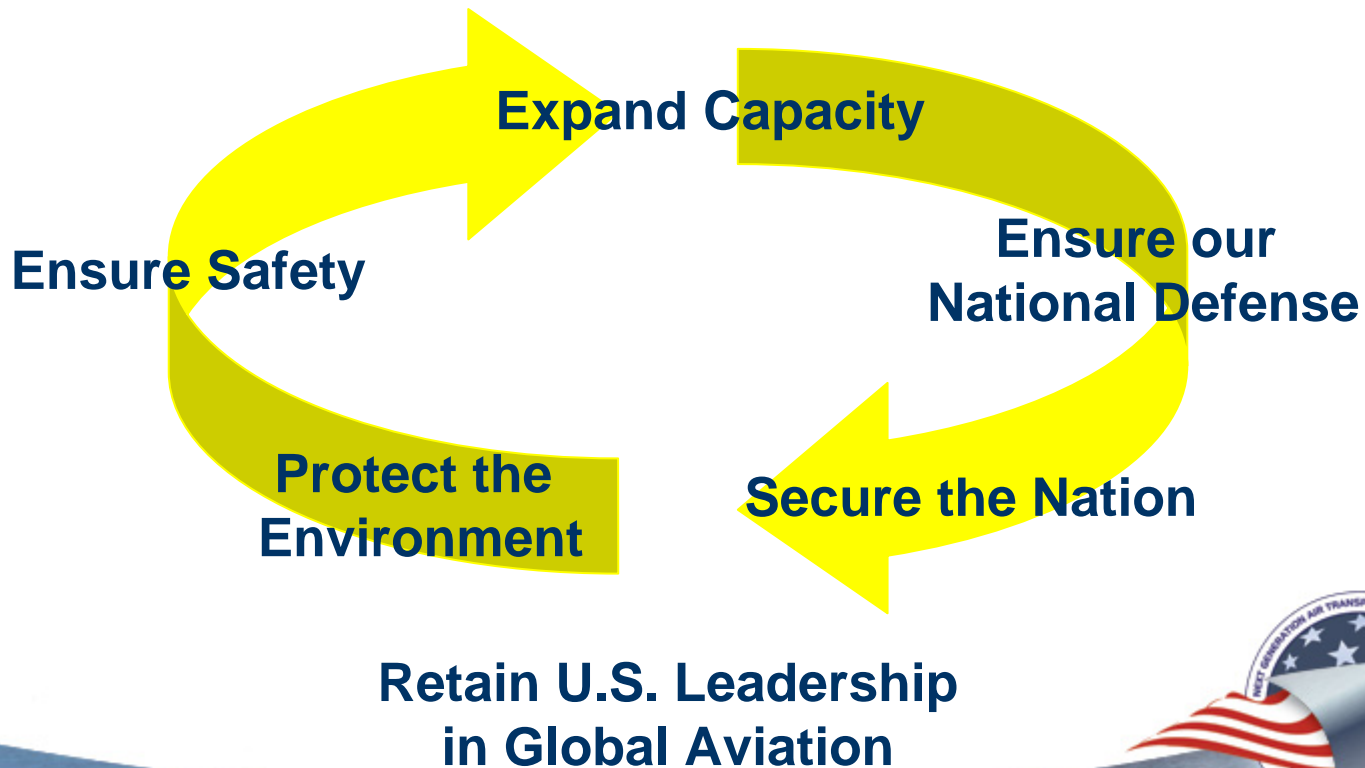
  - *Current* *organization: 8 Integrated Product Teams (IPTs),*
    responsible for key NextGen Capabilities

    - Security IPT (DHS Leads)
      - *Layered, Adaptive Security*
    - Shared Situational IPT (DOD Leads)
      - *Network-Enabled Information Sharing*

NextGen(NGATS) Vision & Goals

A transformed air transportation system that provides services tailored to individual customer needs, allows all communities to participate in the global economy, and seamlessly integrates civil and security operations.

Expand Capacity

Ensure our National Defense

Ensure Safety

Protect the Environment

Secure the Nation

Retain U.S. Leadership in Global Aviation

NextGen (NGATS) Layered, Adaptive Security

Move people & goods expeditiously from "curb-to-curb" while ensuring protection from foreign & domestic threats

- **Adaptive Security for People, Cargo, Airports and Aircraft**

- **Risk Assessment-Driven Evaluation and Response**

- **Positive Identification for People and Cargo**

- **Preventive Threat Detection and Mitigation**

NextGen (NGATS) Security Performance Targets

- **Provide aviation security for 3 times current capacity**

- **Reduce aviation security costs 25%.**

- **Reduce curb-to-curb transit time 30%.**

- **Maintain airport process time under 30 minutes.**

- **Exceed 95% on-time arrivals and departures.**

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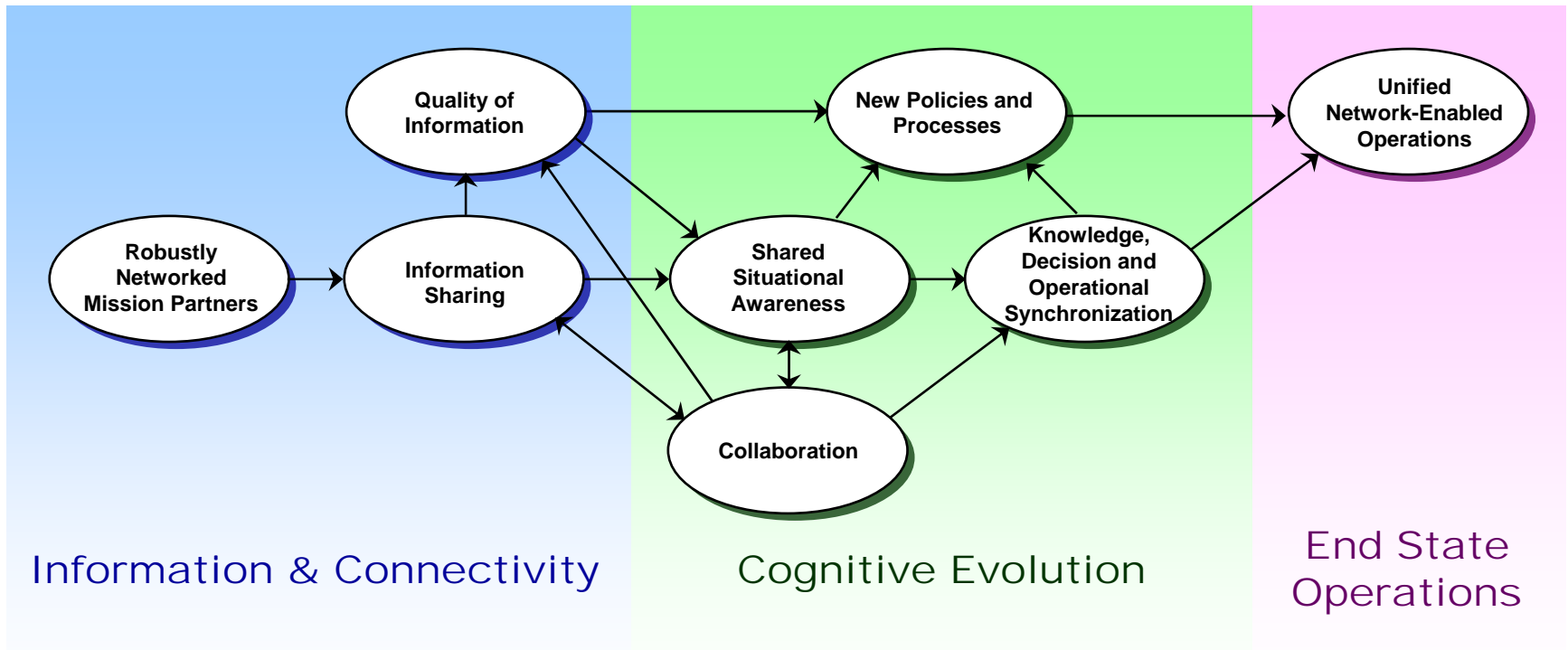# NextGen (NGATS) Layered, Adaptive Security

THREAT

Integrated Risk Management
Secure Airports
Secure People
Secure Checked Baggage
Secure Cargo/Mail
Secure Airspace
Secure Aircraft

Net-Enabled Operations With Shared Situational Awareness

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Transforming Aviation Security Through Network-Enabled Operations

Information & Connectivity

Cognitive Evolution

End State Operations

Robustly Networked Mission Partners → Information Sharing → Quality of Information → New Policies and Processes → Unified Network-Enabled Operations

Shared Situational Awareness

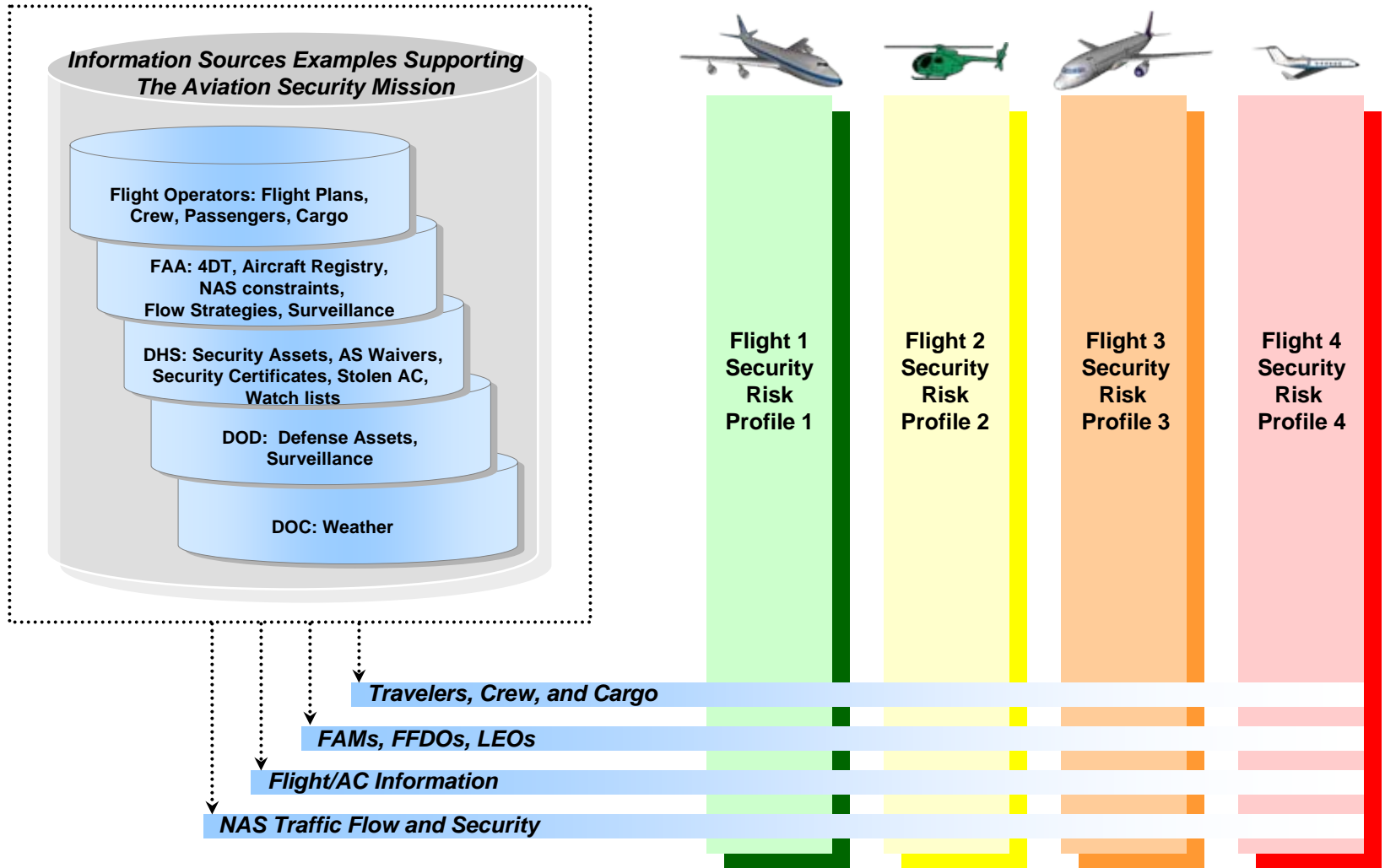Knowledge, Decision and Operational Synchronization

Collaboration

Based on: Col Gary Agron and Col Chuck Pattillo "Network Centric Operations, The Power of Information Age Concepts and Technologies", Office of Force Transformation, www.oft.osd.mil
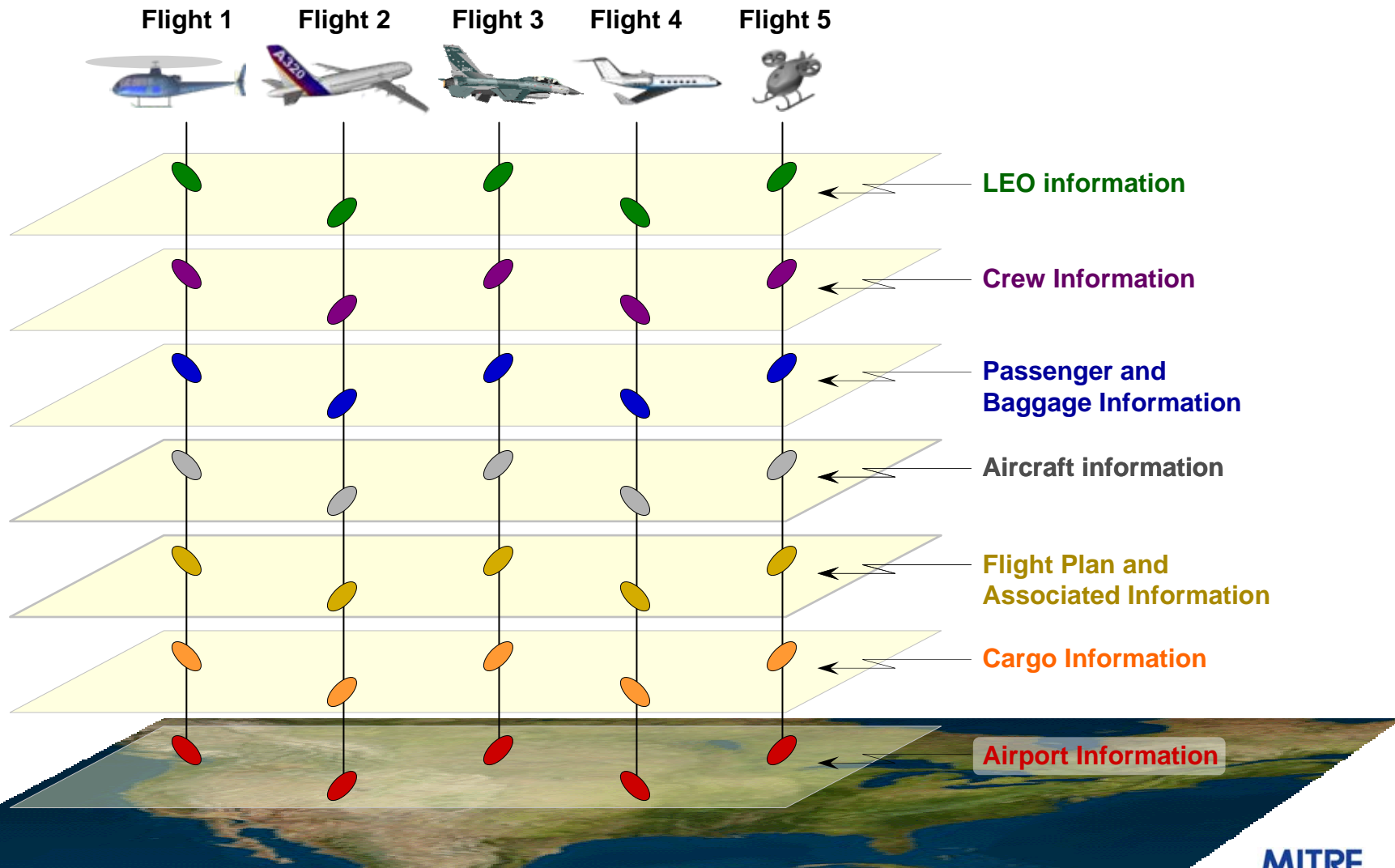
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-- A Notional Example --
A Flight: Enterprise View of Information Sharing in A Network Enabled Aviation Security Environment

Information Sources Examples Supporting The Aviation Security Mission

- Flight Operators: Flight Plans, Crew, Passengers, Cargo
- FAA: 4DT, Aircraft Registry, NAS constraints, Flow Strategies, Surveillance
- DHS: Security Assets, AS Waivers, Security Certificates, Stolen AC, Watch lists
- DOD: Defense Assets, Surveillance
- DOC: Weather

Flight 1 Security Risk Profile 1

Flight 2 Security Risk Profile 2

Flight 3 Security Risk Profile 3

Flight 4 Security Risk Profile 4

Travelers, Crew, and Cargo

FAMs, FFDOs, LEOs

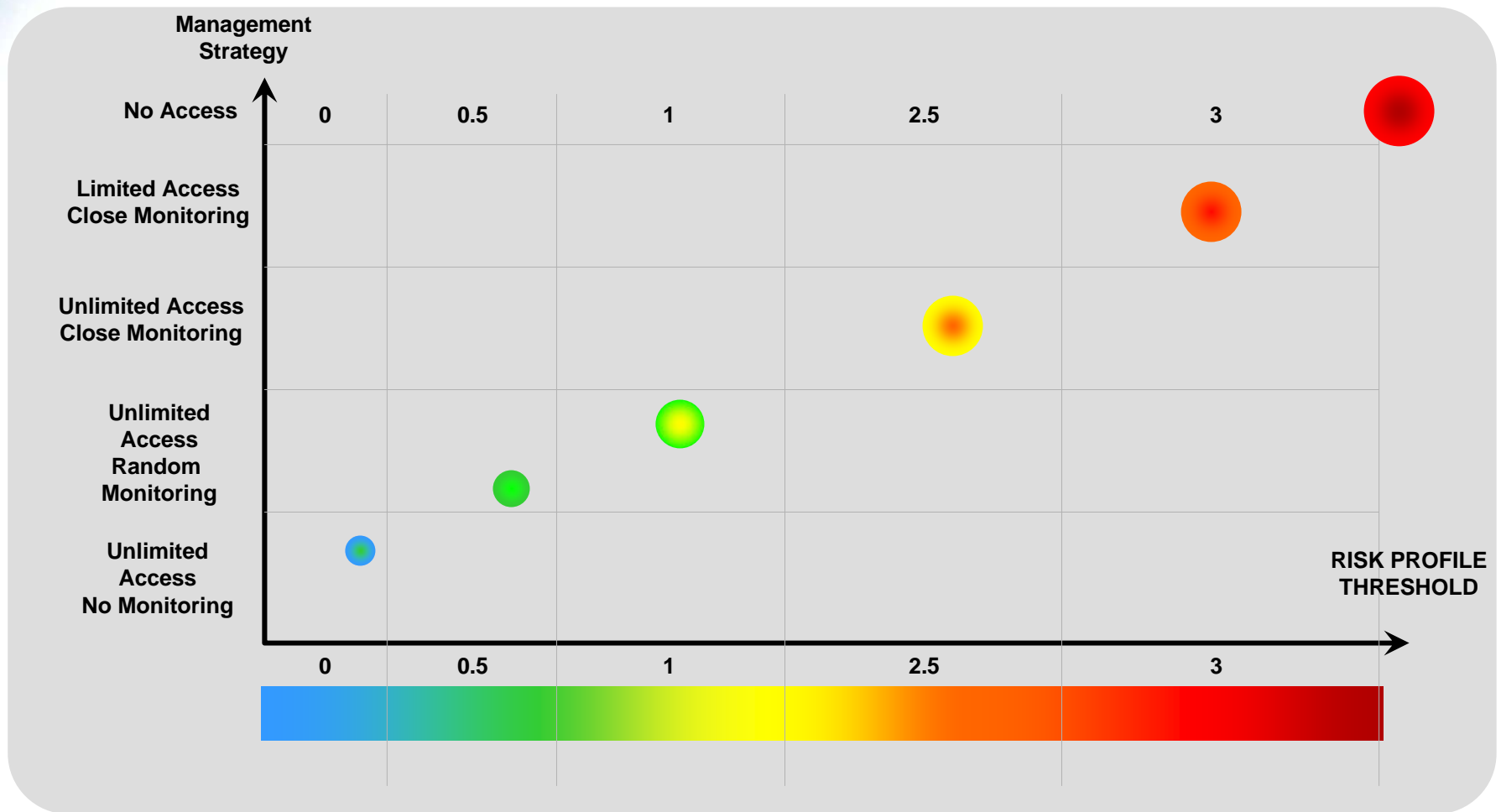*Flight/AC Information*

NAS Traffic Flow and Security

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A Notional Layered Data Framework To Support Shared Situational Awareness

A Notional Example of Risk Profile vs. Airspace Access Strategy

Management Strategy

	0	0.5	1	2.5	3

- No Access
- Limited Access Close Monitoring
- Unlimited Access Close Monitoring
- Unlimited Access Random Monitoring
- Unlimited Access No Monitoring

RISK PROFILE THRESHOLD

0	0.5	1	2.5	3

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Information Sharing Challenges in Network-Enabled Aviation Security
- Example Issues -

- **Policy**
  - **Who can see what information under what condition?**
    - **Privacy**
    - **Clearances**
  - **Roles and Responsibilities**
    - **What is ATM's role in security event management?**
    - **Who pays for what?**
    - **Who makes what decisions when?**

- **Strategy**
  - **What are the visions and goals?**
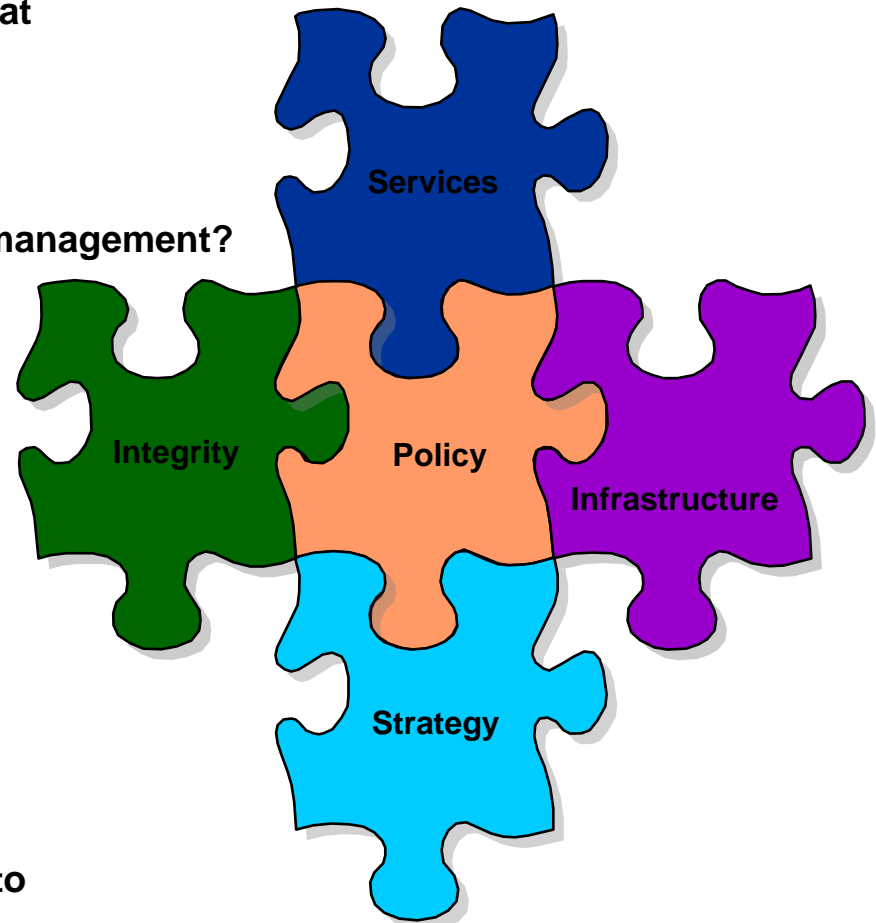 - **Do we strive for unified standards?**

- **Infrastructure**
  - **How do we connect?**
  - **Do we have enough bandwidth?**

- **Integrity**
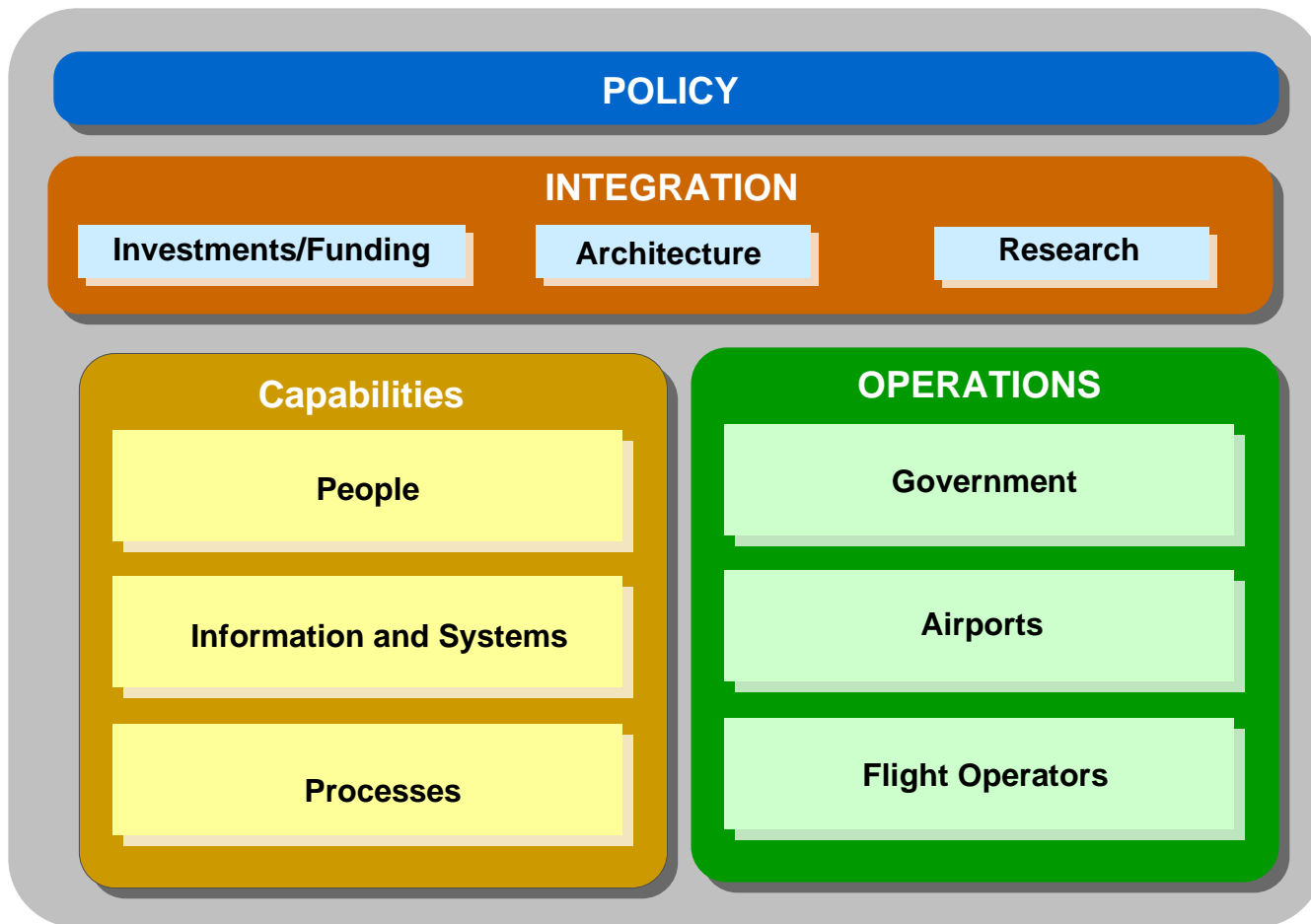 - **Is the information of high quality for decision making?**

- **Services**
  - **What information services are available to the Aviation Security stakeholders?**

Services

Integrity

Policy

Infrastructure

Strategy

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Unified Approach to Transform Aviation Security

POLICY

INTEGRATION

Investments/Funding

Architecture

Research

Capabilities

People

Information and Systems

Processes

OPERATIONS

Government

Airports

Flight Operators

Net-Enabled Operations With Shared Situational Awareness

Integrated Risk Management
Secure Airports
Secure People
Secure Checked Baggage
Secure Cargo/Mail
Secure Airspace
Secure Aircraft
THREAT

Net-Enabled Operations With Shared Situation Awareness
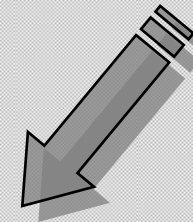
A fundamental shift in information management, communication, and assurance. The future aviation system will be network-centric. It provides authorized users with a seamless, secure, and interconnected information environment, during normal operations or system-wide crisis:

- **A operating picture with common information**

- **Ability to collaborate for decision-making.**

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Where Are We?

The Intelligence Reform and Terrorism Prevention Act of 2004, HSPD 7 & 16, and EO 13356 & 13388

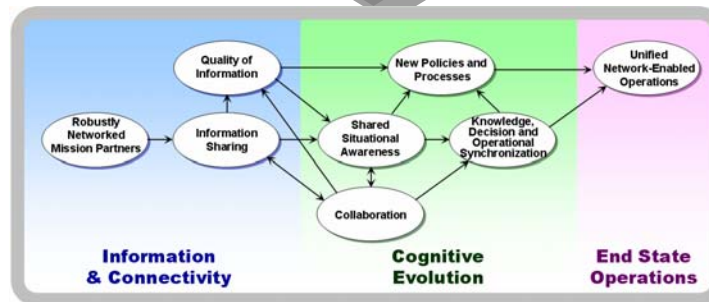Net-Enabled Operations With Shared Situational Awareness

Cross Domain Information Sharing to Enable Net-Centric Operations

NextGen Concept of Operations and Roadmap

Government Agencies With Independent Information Architecture Strategies

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Aviation Security Can be Transformed with Shared Situational Awareness.

Thank You!

Vanessa Fong, cvfong@mitre.org

Backup Slides

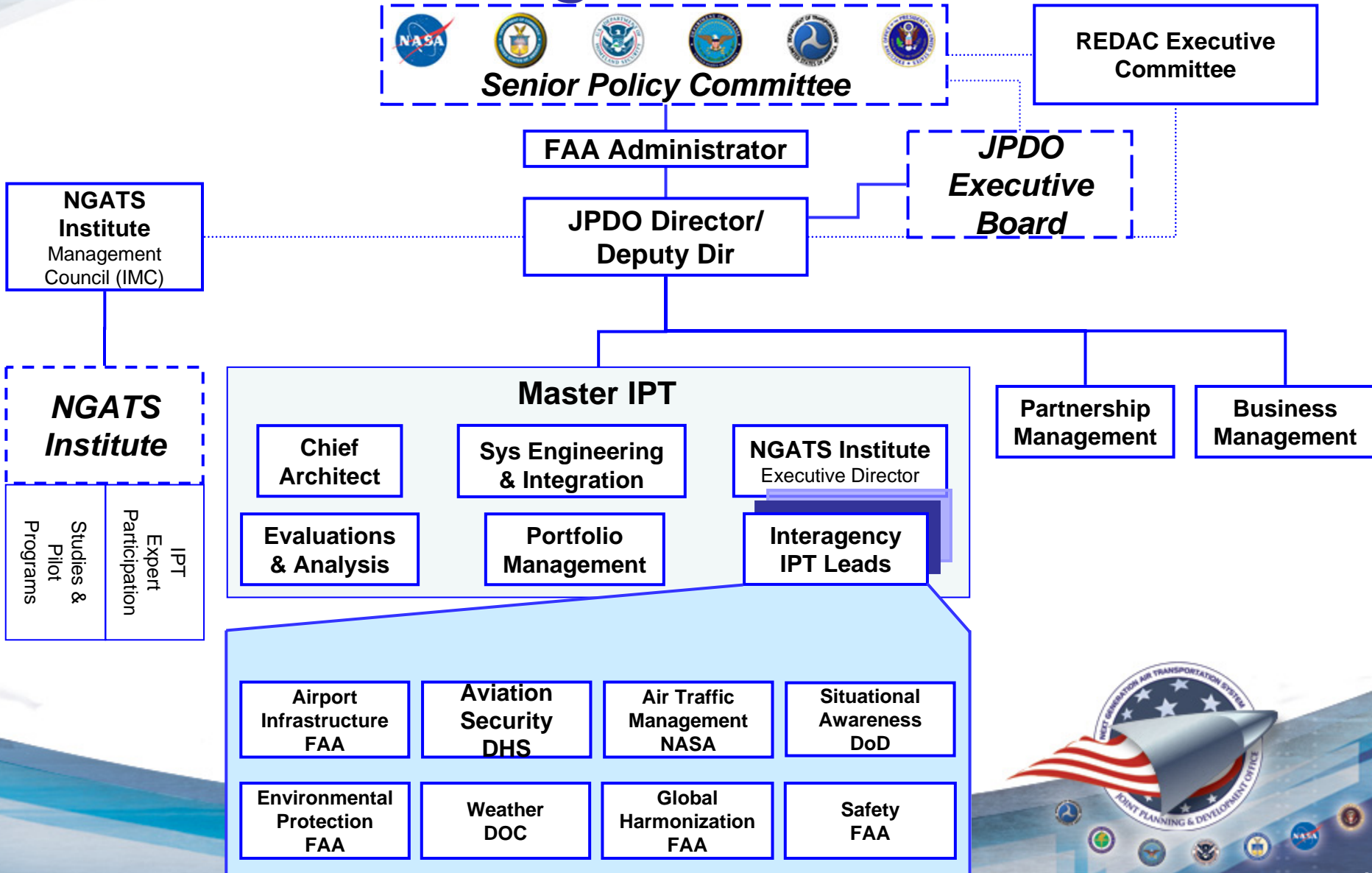# Current NextGen (NGATS) Organization

Senior Policy Committee

REDAC Executive Committee

FAA Administrator

JPDO Executive Board

JPDO Director/ Deputy Dir

NGATS Institute
Management Council (IMC)

NGATS Institute

IPT Expert Participation

Studies & Pilot Programs

Master IPT

Chief Architect

Sys Engineering & Integration

NGATS Institute
Executive Director

Evaluations & Analysis

Portfolio Management

Interagency IPT Leads

Partnership Management

Business Management

Airport Infrastructure FAA	Aviation Security DHS	Air Traffic Management NASA	Situational Awareness DoD
Environmental Protection FAA	Weather DOC	Global Harmonization FAA	Safety FAA

JPDO Process for Achieving NextGen (NGATS)

Baseline and Assess Today's Performance
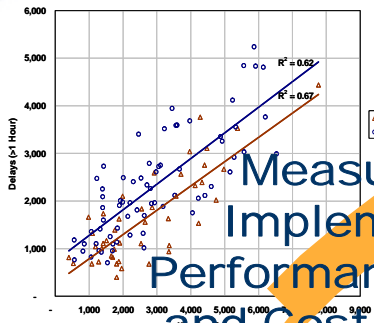
Measure Post-Implementation Performance, Service, and Cost of Segment
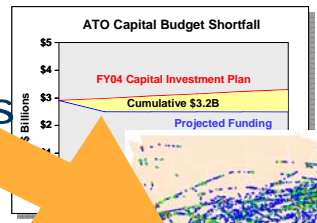
Identify Future Capabilities and Outcomes; Define Concept of Operations;

- **Define the "What"**
- **Architect & Analyze**
- **Define Solutions**
- **Execute & Measure**
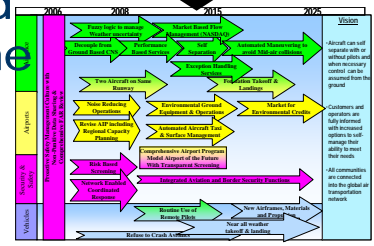
Define and Implement Incremental Solutions via Segments

Develop Enterprise Architecture; Analyze Alternative Solutions and Assess Tradeoffs

Policy, Portfolio, Roadmaps, and Business Cases
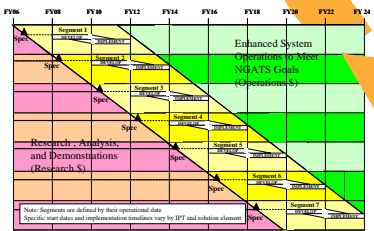
Determine Program and Research Needs