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

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Air Transportation System Forecast Demand

- Flights: 1.4-2X
- Passengers: 1.8-2.4X
- Cargo tons: 3-5X
- Jet Aircraft: 2-3X
- Year 2025

Factor of Increase

2004

2025
• 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.
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 Safety
- Protect the Environment
- Ensure our National Defense
- Secure the Nation
- Retain U.S. Leadership in Global Aviation
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.
NextGen (NGATS) Layered, Adaptive Security

Net-Enabled Operations With Shared Situational Awareness
Transforming Aviation Security Through Network-Enabled Operations

Information & Connectivity
- Robustly Networked Mission Partners
- Information Sharing
- Quality of Information

Cognitive Evolution
- Shared Situational Awareness
- Knowledge, Decision and Operational Synchronization
- Collaboration
- New Policies and Processes

End State Operations
- Unified Network-Enabled Operations

-- 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
A Notional Layered Data Framework To Support Shared Situational Awareness

Flight 1  Flight 2  Flight 3  Flight 4  Flight 5

- LEO information
- Crew Information
- Passenger and Baggage Information
- Aircraft information
- Flight Plan and Associated Information
- Cargo Information
- Airport Information
A Notional Example of Risk Profile vs. Airspace Access Strategy

Management Strategy

- 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
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?
Unified Approach to Transform Aviation Security

POLICY

INTEGRATION

Investments/Funding
Architecture
Research

Capabilities

People
Information and Systems
Processes

OPERATIONS

Government
Airports
Flight Operators
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.
Where Are We?

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

Cross Domain Information Sharing to Enable Net-Centric Operations

Government Agencies With Independent Information Architecture Strategies
Aviation Security Can be Transformed with Shared Situational Awareness.

Thank You!

Vanessa Fong, cvfong@mitre.org
Backup Slides
JPDO Process for Achieving NextGen (NGATS)

Define and Implement Incremental Solutions via Segments

- Define the “What”
- Architect & Analyze
- Define Solutions
- Execute & Measure

Determine Program and Research Needs

Determine Post-Implementation Performance, Service, and Cost of Segment

Baseline and Assess Today’s Performance

Identify Future Capabilities and Outcomes; Define Concept of Operations;

Develop Enterprise Architecture; Analyze Alternative Solutions and Assess Tradeoffs

Policy, Portfolio, Roadmaps, and Business Cases

Note: Segments are defined by their operational date

Specific start dates and implementation timelines vary by IPT and solution element