REDAC / NAS Ops

Operations Concept Development & Infrastructure (ATDP)

BLI Number: 1A01C

Maureen Keegan, AJV-73
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Why is this program necessary?

- The FAA is proceeding with NAS modernization for the National Airspace System. Concept development and validation is necessary to investigate specific concept elements underpinning these artifacts, and to drive out operational and technical requirements and implications for human factors, training and procedures. Without this, uncertain, unreliable, and potentially non-viable and non-beneficial changes to the NAS could occur. Ultimately, this program ensures that enhancements to the NAS are operationally sound and that sufficient risk mitigation activities for new concepts are completed. This program contributes to the FAA’s support for RTCA, a non-profit association that develops standards based on manufacturers, government, and aviation operator inputs. RTCA also recommends operational improvements to increase the efficiency of air transportation. The development of standards and global harmonization activities across the ATM community is essential to successful concepts and requirements development. This program contributes to the FAA’s support for RTCA, a non-profit association that develops standards based on manufacturers, government, and aviation operator inputs. RTCA also recommends operational improvements to increase the efficiency of air transportation.

- ATDP also;
  - Investigates specific concept elements
  - Drives out operational and technical requirements and implications for human factors, training and procedures
  - Assesses the interaction of changing roles and responsibilities of NAS service providers and pilots, airspace changes, procedural changes and new mechanized systems for distributing weather, traffic and other flight related information
  - Tests the assumptions behind common situational awareness and distributed information processing
What are the benefits to the FAA
The activity supports the FAA’s Strategic Initiatives by delivering benefits through technology and infrastructure; Concept validation supports development, analysis, and simulation of new concepts to assess requirements and to evaluate the impact of the concept on system capacity, efficiency, safety and human performance. Evaluation criteria include the following:

- Impact/Improvement to Air Traffic Service Providers, airspace users, and automation that could increase capacity,
- Impact/Improvement on airspace structure which may increase productivity and hence capacity,
- Impact/Improvement on communication, navigation, and surveillance (CNS) requirements to support the FAA's efforts to reducing cost, increasing capacity and efficiency and;
- Impact/Improvement on automation, display, and facility configuration elements to increase productivity and hence capacity.

What determines program success
Success is measured by the completion of the goals identified in multi-year plans developed for each activity. Initiatives that successfully complete all the project goals identified are then presented as candidates for acquisition.
Operations Concept Development & Infrastructure – ATDP / BLI Number: 1A01C Overview Capabilities

People:
- Program Manager: Maureen Keegan
- Subject Matter Experts: Traffic Managers, ATC, Discipline Experts, Airspace User Community
- Research Partners: ANG, NASA, Mitre, Lincoln Labs, Volpe, Academia

Laboratories:
- MITRE
- Tech Center
- DAB Test Bed
- NASA
- Volpe
Focus Area

• Improved TBFM/TFMS Data Integration
  - Objective: Explore the use of the TFMS toolset to strategically pre-condition demand into TBFM
  - Leverages on-going research by NASA
Focus Area

• Improved TBFM/TFMS Data Integration
• Status:
  ✦ Development of Use Cases for a near-term capability is on-going. Final delivery planned for this summer.
  ✦ Developing plan for the execution of a near-term capability.
Initial TBO Gap Analysis

• TBO Vision ➔ Time-Based Management (TBM) + PBN
  “TBO is an ATM method for strategically planning, managing, and optimizing flights throughout the operation by using TBM, information exchange between air and ground systems, and the aircraft’s ability to fly precise paths in time and space.” - FAA Vision for TBO

• Focus on delivery of capabilities for approximately next 5 years (~2022)
  • Accounts for budgeted implementation waterfalls of key capabilities
  • Initial set of capabilities enable the first comprehensive TBM environment phase
  • Interdependencies among initial set of capabilities are strongly coupled
TBFM - Airborne Metering

STARS

TBFM - Departure Scheduling

TBFM - IDAC

TBFM - EDC

TFMS – Improved Demand Predictions (IDP)

TBO Capabilities Sequencing by Domain

Operational Context

PERTI Processes and Procedures

Departure

En Route

Arrival

Approach

TFMS - TBFM/ERAM - GIM - S Extended Metering/Coupled Scheduling

TFMS - TBFM/ERAM - Path Stretch

TFMS - TBFM-RTA/TOAC

TFMS - TSAS Tools

PBN SIDS

STARS

PBN STARS

TFMS - GDP/AFP/CTOP

TFMS - GDP/CTOP

TFMS - PDRR

TFMS - IDRP

TFMS - Surface

TFMS - Situational Awareness (Surface Viewer)

TFDM

TFDM

TFDM

TFDM

TFDM

Existing Capability

In-Process Deployment

2019+ Deployment

Weather Information – NextGen Weather Processor (NWP) /Common Support Services-Weather (CSS-Wx)

Data Communications

TFMS - Runway Sequence and Assignment

TFMS - STARS-Runway Sequence and Assignment

TFMS - STARS-Speed Advisories

TFMS - STARS-Slot Markers

RNP-RF

ATPA

EoR

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**Space Integration Enhancements**

- **Goal:** Leverage work to date to develop ATO capabilities, services, systems and procedures to integrate space operations into the NAS
  - Support the acquisition process by addressing shortfalls from preliminary Shortfall Analysis Report (pSAR) 2015 and Validation
  - Phased investment approach integrating various stakeholders, current capability efforts, and future identified capabilities
  - Leverage extensive efforts/research conducted by NextGen (ANG), System Operations (AJR) and the Office of Commercial Space Transportation (AST)
  - Prioritize operational capabilities for Space Integration Enhancements Work Packages
Strategy

New Capabilities
- Pre-Capability
- Space Data Integrator
- Other Prototype Capabilities
- Aircraft Hazard Area Generator (RRAT)
- Hazard Risk Assessment & Management

Core Infrastructure
- Traffic Flow Management/Collaborative Air Traffic Management Technologies
- ERAM Enhancements and Tech Refresh
- Terminal Systems Enhancements

Policy & Procedures
- Work Group for Development of Policy/Procedure Items

Diagram timeline from CY2017 to 2026 with milestones such as IARD, IID, FID, and Space Integration Enhancements WP1.
Space Integration Enhancements Next Steps (from last report out out)

**Program Activities**
- Complete conceptual solutions/capability identification effort
- Prioritize with stakeholders conceptual solutions/capabilities
  - AJM, AJR, AJT, AJV, ANG, AST, NATCA, others
- Initiate CONOPs development/validation
  - leveraging ANG Space Vehicle Operations concept work
- Update Enterprise Architecture artifacts

**Collaboration/Outreach Activities**
- Finalize resource needs and source(s)
- Continue stakeholder engagement
Objective: Develop a prioritized list of conceptual solutions in preparation for the Space Integration Enhancements Investment Analysis

- Utilizing SME input, provide an independent, cross domain perspective for the relative priority of the operational needs.
- Analyze SME input and apply weighting schema to determine the prioritized list of conceptual solutions.
## Operational Focus Group

<table>
<thead>
<tr>
<th>Facility</th>
<th>Participants</th>
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</thead>
<tbody>
<tr>
<td>NATCA National Office</td>
<td>1</td>
</tr>
<tr>
<td>ZMA Miami Center</td>
<td>3</td>
</tr>
<tr>
<td>SCT Southern California TRACON</td>
<td>1</td>
</tr>
<tr>
<td>ZLA Los Angeles Center</td>
<td>2</td>
</tr>
<tr>
<td>ZDC Washington Center</td>
<td>3</td>
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<td>ZOA Oakland Center</td>
<td>2</td>
</tr>
<tr>
<td>F11 Central Florida TRACON</td>
<td>2</td>
</tr>
<tr>
<td>ATCSCC Command Center</td>
<td>3</td>
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<tr>
<td>AJV-7</td>
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## HQ Stakeholder Focus Group

<table>
<thead>
<tr>
<th>Office</th>
<th>Participants</th>
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<tr>
<td>NextGen (ANG-B, ANG-C)</td>
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<tr>
<td>Program Management Office</td>
<td>1</td>
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<tr>
<td>ATCSCC Command Center (AJR-1100)</td>
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<tr>
<td>Office of Commercial Space</td>
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<tr>
<td>Office of Safety</td>
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<td>Airports</td>
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<td>Air Traffic Operations</td>
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<td>Office of Procedures (AJV-8)</td>
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<tr>
<td>Office of ATO Space Integration (AJV-0)</td>
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</tbody>
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Prioritization Results

Solution Ranking

Score (0-1)

Rank

Stakeholder Score
Field Score
Differences in Field and HQ Inputs

- Perspective of the Field personnel is largely “day of operation”
- Perspective of Headquarters is primarily “planning, approval, and strategy” of operations
- There are 13 Conceptual Solutions that are shared in the Top 15 priority of the two groups, these are recommended for WP1
Questions?