



Federal Aviation
Administration

REDAC / NAS Ops

Review of FY 2021 Proposed Portfolio

*Operations Concept Development
and Infrastructure (ATDP)*

BLI Number: 1A01C

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Operations Concept Development and Infrastructure (ATDP) 1A01C

What are the benefits to the FAA

These activities support 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.

ATDP/ BLI# 1A01C

Overview Capabilities

People:

- Program Manager: James Wetherly
- 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

ATDP– Accomplishments in FY19

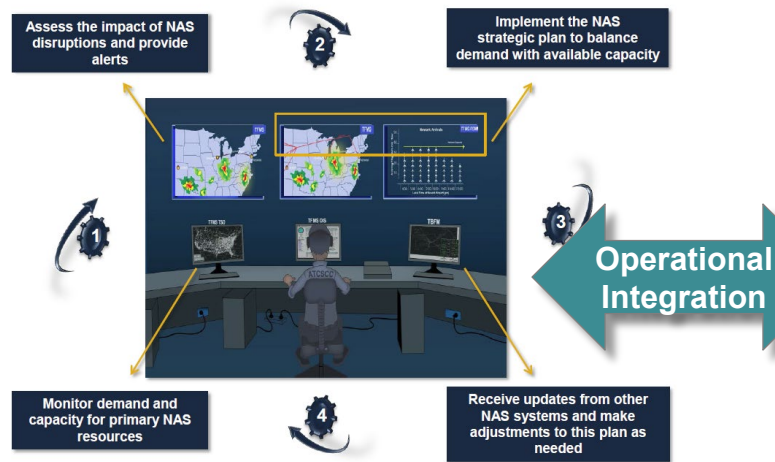
- **TBFM – TFMS Operational Integration**
 - Completed assessment of on-going NASA research for the use of the current TFMS toolset to precondition demand into TBFM
 - Developed recommendations for an operational assessment
- **Initial Trajectory Based Operations (iTBO) Operational Scenario Decomposition (OSD)**
 - Validated areas for further analysis and monitoring
- **Use of Required Time of Arrival (RTA)**
 - Explored the use of RTA for Time Based Management across multiple sectors within an ARTCC
 - Explored the effects of RTA on En Route Automation
- **Emerging Use of Dashboards for Operations**

TBFM-TFMS Operational Integration

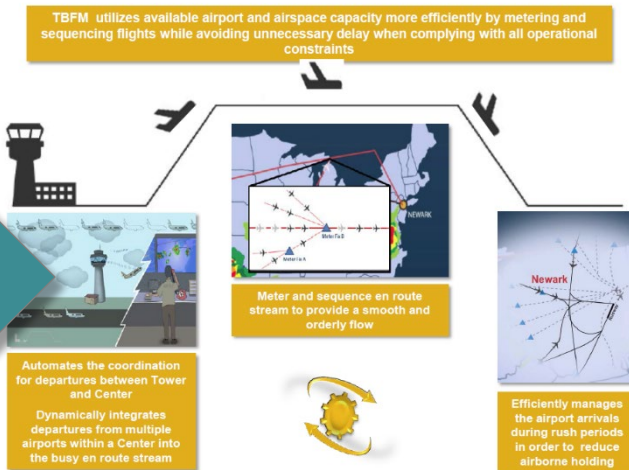
- **Description**

- Identify capabilities and/or data exchange between TBFM and TFMS to operationally integrate strategic and tactical flow management initiatives

TFMS: Focuses on efficiently improving the “greater NAS”



TBFM: Metering and Sequencing



Graphic source: FAA

Potential Benefits

- ✓ Reduced double delay experienced by operators
- ✓ Informs expectations for improved operator fleet management decision-making
- ✓ Reduced airborne delay

TBFM-TFMS Operational Integration

- **Status:**
 - Completed PHL's operational baseline view for nominal days,
 - Completed analysis of potential toolset for operational assessment.
- **Next Steps:**
 - Explore with FAA workforce and flight operators the implications of implementing this concept,
 - Coordinate field trial for PHL arrival metering,
 - Continue collaboration with NASA to identify needed technologies for consideration under future investments.

iTBO – Operational Scenario Decomposition

- **Description:**
 - Scenarios decomposed using System Interaction Diagrams, to inform system owners for analysis and adjudication, and identify areas of further research
- **Findings:**
 - Validated areas for further analysis or monitoring
 - Transitioned long term needs to ANG

Further Analysis	Monitoring
<ul style="list-style-type: none">• Effect of flights transitioning from oceanic/foreign airspace on metering operations• Terminology normalization across the TFM environment	<ul style="list-style-type: none">• Departure Route and Fix Management• Layered TMI Delays and Flight History

Use of Required Time of Arrival (RTA)

- **Description:**
 - Assess the use of RTA in the cruise phase of flight, for extended metering operations, before top of descend
- **Status:**
 - Results indicate that using RTA to manage extended metering operations in the cruise phase of flight is feasible (Leveraging the Flight Management System (FMS) RTA capabilities available today to meet a TBFM generated schedule)
- **Next Steps:**
 - Work complete. Requirements under consideration as part of the next TBFM enhancement investment.

Emerging Use of Dashboards for Operations

- **Description:**

- Analyze shortfalls within the context of situational awareness at the ATCSCC,
- Develop path forward to mitigate shortfalls and enhance situational awareness,
 - Includes NAS performance monitor and alert capabilities for Traffic Managers at the ATCSCC,
 - Provides a view of NAS status using a set of performance metrics and data sources with configurable alert thresholds,
- Leverages existing NAS Operations Dashboard (NOD) prototype, and the TBFM Dashboard concept.

- **Status:**

- New start

Anticipated Research in FY20

Planned Research Activities

- Operational Integration Analysis: Conduct analysis of possible operational integration issues as emerging concepts evolve,
- Advanced Rerouting and Time-Based Management (TBM) Operations: In collaboration with NASA, conduct concept validation activities, support technical transfer activities, and artifact development for the integration of advanced rerouting and TBM,
- Trajectory-Based Operations (TBO): Leveraging previous trajectory-related elements/activities (e.g., PBN, T/S/S Tools), and international activities, mature TBO concepts through scenario development and simulation activities.

Expected Research Products

- Identification of operational opportunities and challenges as emerging concepts evolve,
- Simulation activities, mature Concept of Operations, and risk mitigation recommendations,
- Tech transfer packages.

Emerging FY21 Focal Areas

- **Operational Integration Analysis as emerging concepts evolve,**
- **Enhanced synchronization of strategic and tactical capabilities to optimize Time-Based Management.**

Operations Concept Development and Infrastructure (ATDP)

Research Requirement

Enhanced synchronization of strategic and tactical capabilities to optimize Time-Based Management (TBM) operations

Other areas may surface as plans mature

Outputs/Outcomes

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 potentially leading to investment decision.

FY 2021 Planned Research

Analysis and refined concepts leading to enhanced synchronization of strategic and tactical capabilities to optimize TBM operations

Analysis and concept generation on operational issues as they arise

Out Year Funding Requirements

FY19	FY20	FY21	FY22	FY23
\$ 5M	\$ 5M	\$ 6M	\$ 6M	\$ 6M