FAA Office of NextGen (ANG)

REDAC / NAS Ops

Review of FY2022 – 2024 Proposed Portfolio

Enterprise Concept Development

BLI Number: 1A11A

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What are the benefits to the FAA

- The Enterprise Concept Development program is used to identify and assess early NextGen concepts and conduct validation activities (i.e., modeling and real-time simulations) that will transform the National Airspace System (NAS) into the Next Generation of the NAS. Areas of interest include, but are not limited to, trajectory-based coordination, the use of artificial intelligence in the NAS and the potential of unmanned aircraft systems for urban transportation. When appropriate, concept activities will be considered from a global perspective including International Civil Aviation Organization (ICAO) requirements for global aircraft tracking and network communication.

- Validated operational concepts and feedback from stakeholders have led to advancements in research and pre-implementation work to determine the feasibility of advanced concepts and maximize benefits and flexibility for NAS users.

- This program executes research, engineering analysis, demonstrations and evaluations in support of service analysis and strategic planning.

What determines program success

- This program is necessary to assess the feasibility of proposed NextGen capabilities during the early phases of the Acquisition Management Systems lifecycle. The program develops and conducts studies that prove out NAS concepts to ensure feasibility and viability within the NAS.
Extensible Traffic Management (xTM) Framework Analysis

This project will investigate and analyze future Extensible Traffic Management (xTM) services that allow for new entrant operations and technologies to co-exist with conventional Air Traffic Services (ATS), by the sharing of fully integrated and interoperable digital information. It will address the operations of select new entrants within dynamically segregated airspace. The project's operational analysis and engineering activities will focus on the initial development of an xTM framework that will extend traffic management services to new entrants (1) beyond those currently provided by Air Traffic Control & Traffic Flow Management (2) that leverage Internet and wireless technologies to provide full connectivity; and (3) that are scalable and can be offered to new emerging markets.

Planned Research Activities
• xTM Analysis & Framework Development
• Perform validation exercises with xTM Subject Matter Experts

Expected Research Products
• Initial xTM Framework Analysis Document
• xTM Framework Document
• xTM Framework Analysis will continue into FY23
Artificial Intelligence (AI) for the NAS

The objective of the AI for the NAS project is to evaluate how various artificial intelligence methods can be leveraged to improve the management of the NAS. Potential applications in the aviation industry include leveraging artificial intelligence to support Air Traffic Control (ATC), Flow Management General Aviation (GA) (i.e. flight following).

Planned Research Activities

- Planned start in FY23
- Preliminary AI for the NAS Scenarios, Use Cases, and Concept of Operations

Expected Research Products

- Draft scenarios and use cases for AI for the NAS
- Develop AI for the NAS Concept of Operations
Trajectory Based Operations (TBO) Concept

The program plans to develop operational scenarios and vignettes that help put the 2035 Vision for Air Traffic Management Services in an operational context and use these to develop a Level I concept of operations that corresponds to the 2035 Vision.

Planned Research Activities

- Planned activities will conclude in FY22 Q2
- Concept of Operations for ATM Services in 2035
- Complete development of initial requirements document for trajectory collaboration and NAS application

Expected Research Products

- Initial Concept of Operations
- No planned activities past FY22
Current FY22 Accomplishments

• Preliminary Draft CONOPs for NAS 2035
• xTM Operational View Document
• xTM Framework Document
• xTM Concept – Development Support Package
Anticipated Research in FY23

**Planned Research Activities**

- Develop detail operational scenarios for the seamless integration of xTM in the 2030-2035 timeframe
- Planned Research activities will be in support of Extensible Traffic Management (xTM) Engineering Efforts
- Develop a draft functional analysis for Artificial Intelligence (AI) for the NAS and complete an update of AI for the NAS Concept of Operations

**Expected Research Products**

- Functional Analysis Document for AI for the NAS
- AI for the NAS CONOPs
- xTM Operational Scenarios Document
Emerging FY24 Focal Areas

• Continued Planned research activities for Artificial Intelligence for the NAS
• Evaluation of AI applications to support ATM and NAS operations
• Continued Planned Concept work for Dynamic TBO
• Development of a Concept of Operations for Smart Airports
Research Requirements
This program will validate new concepts and generate information supporting the validity of identified capability shortfalls, future service needs, and capability requirements that will foster increased system capacity, efficiency, and throughput. Validated operational concepts will identify technical and operational requirements (including airspace procedures) and automation requirements needed to realize the capacity gains.

FY 2024 Planned Research
- Continued planned research activities for Artificial Intelligence for the NAS
- Evaluation of AI applications to support ATM and NAS operations
- Continued planned Concept work for Dynamic TBO
- Develop a Smart Airports Concept of Operations

Outputs/Outcomes
- TBO Concept of Operations for capabilities associated with incorporation of operator and pilot preferences
- xTM Analysis and Framework Development

Out Year Funding Requirements

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