# **REDAC / NAS Ops**

## Review of FY 2022 Proposed Portfolio

Enterprise Concept Development

**BLI Number: 1A11A** 

Steve Bradford, ANG-3

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Federal Aviation Administration

## **Enterprise Concept Development**

### What are the benefits to the FAA

- 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.



## **FY19 Accomplishments**

Projects in FY19 under Enterprise Concept Portfolio construct:

- •NOTAM Gap Analysis and Modernization ConOps
- •ETM Concept Development
- •ETM, UTM, & ATM Cross Dependencies Analysis
- •VCV Departure Concept Validation Report
- •VCV Preliminary Gap Analysis
- •UAM Intended Use Evaluation and Analysis of Traffic Management Environments



## Notice to Airmen (NOTAM) Modernization

The objective of NOTAM Modernization is to provide flight critical information on a timely basis that is more current than other regularly scheduled publications can provide. NOTAM information may inform NAS users about a wide range of changing operational environmental factors including time critical delays, corrections or changes to previously published data concerning navigational aids, Airport Traffic Control Towers (ATCT) hours of service changes, surface or airspace changes in hours of operations, Remote Communications Outlet (RCO) status, weather reporting station availability, public airport openings and closings, Aircraft Rescue and Firefighting (ARFF) capability and restrictions, changes in runway characteristics or conditions, NAS lighting systems changes.

#### **Planned Research Activities**

• Activities concluding in FY19

#### **Expected Research Products**

- NOTAM Gap Analysis
- NextGen Modernization ConOps



## Class E Upper Airspace Management (ETM) Concept Development

The objective of the ETM project is to conduct research, analyze and develop concepts for future operations above FL600. While current Class E (upper airspace) regulations are predicated on traditional airspace usage, increasing commercial interests and the advent of new technologies present new challenges for the diversified operations within this airspace. ETM is an airspace management concept that describes a vision for future Class E (upper airspace) operations, encompassing a wide range of operational mission characteristics in this airspace; including geostationary, extreme velocity and long duration operations.

#### **Planned Research Activities**

• Activities concluding in FY19

#### **Expected Research Products**

ETM Concept of Operations



## **Vertical Conformance Verification (VCV)**

The objective for this capability is to leverage the use of automation to explore how the availability of vertical rate information will improve controllers' ability to monitor aircraft conformance to increase efficiency and capacity in transition airspace. The VCV concept is expected to increase safety and NAS efficiency.

#### **Planned Research Activities**

Activities concluding in FY19

#### **Expected Research Products**

VCV Departure Concept Validation Report



## **Urban Air Mobility (UAM) Concept Development**

The objective of the UAM project is to develop a concept for immediate and flexible air transportation within a metropolitan area consisting of passenger-carrying operations. UAM enables unmanned vehicles with passengers to travel within an urban and metropolis environment at lower altitudes. UAM vehicles are assumed to require various degrees of autonomous operations to reach their full potential as the concepts are implemented and the market develops. The outcomes of this project will support the initial engineering and system prototype development effort for UAM, leading to future demonstrations to support concept maturity.

#### **Planned Research Activities**

Initial Stakeholder Needs & Intended Use Analysis

#### **Expected Research Products**

- UAM, UTM and ATM Interaction Analysis
- Initial Concept of Operations



## **Anticipated Research in FY20 and FY21**

### **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), General Aviation (GA) (i.e. flight following), and NOTAMs.

#### **Planned Research Activities**

• Planned start in FY21

### **Trajectory Based Operations (TBO)**

The objective of the TBO work under Enterprise Concepts is to explore concepts for the Dynamic TBO timeframe, define concepts of user and/or operations for these elements of Dynamic TBO, and to develop operational scenarios associated with Dynamic TBO.

#### **Planned Research Activities**

Planned start in FY20



### **Emerging FY22 Focal Areas**

- Initial operational scenarios for Dynamic TBO and modeling
- Dynamic TBO Integrated Concept
- AI for the NAS Scenarios, Use Cases, and Concept of Operations



# **Backup Slides**



### 1A11A – G05A.02-10 - Enterprise Concept Development – F&E

#### **Research Requirement**

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.

#### **Outputs/Outcomes**

•UAM Concept of Operations

•Evaluation of AI applications to support ATM and NAS operations

•TBO Concept of Use for mobile

•TBO Concept of Operations for capabilities associated with incorporation operator and pilot preferences

•Development of operational scenarios for Dynamic TBO

#### FY 2022 Planned Research

- Planned research activities for Artificial Intelligence for the NAS
- Planned research activities for Urban Air Mobility (UAM) Concept Development
- Planned Concept work for Dynamic TBO

#### **Out Year Funding Requirements**

FY19	FY20	FY21	FY22	FY23
\$1.5M	\$1.5M	\$1.5M	\$1.5M	\$1.5M

