A3.01 Advanced Air Traffic Management System Concepts

Lead Center: ARC

Participating Center(s): LaRC

Technology Area: TA15 Aeronautics

Scope Description

This subtopic addresses contributions towards Air Traffic Management (ATM) systems and concepts with potential application in the near-future National Airspace System (2025-2030). The subtopic seeks proposals that can apply novel and innovative technologies and concepts towards addressing established ATM challenges of improving efficiency, capacity, and throughput while minimizing negative environmental impact, and maintaining or improving safety and/or which can accelerate the implementation of NASA technologies in the current and future National Airspace System (NAS).

The NASA technologies that are being researched and developed for the future NAS include, but are not limited to; Integrated Arrival, Departure, and Surface (IADS) capabilities, routing and rerouting around weather from ground-based and cockpit-based systems, tools enabling Trajectory-Based Operations (TBO), and capabilities that can be integrated with a fully-realized Unmanned Aircraft Systems Traffic Management (UTM) system for a wide range of commercial and public use.

Technologies, concepts, models, algorithms, architectures and tools are sought in this solicitation to bridge the gap from NASA's Research and Development (R&D) to operational implementation, and should address such nearer-term ATM challenges as:

- Safe, end-to-end TBO
- Enabling and integrating existing independent systems and domains, and increasingly diverse and unconventional operations (gradually enabling the future integration of large unmanned vehicles, unconventional commercial airline business models, space traffic management, subsonic and supersonic vehicles)
- Applying elements of the service-based architecture concept being pioneered in the UTM domain

References

https://www.nasa.gov/aeroresearch/programs/aosp

Expected TRL or TRL range at completion of the project: 1 to 4

Desired Deliverables of Phase II
Desired Deliverables Description

Technologies that can advance safe and efficient growth in global operations (ARMD Thrust 1 Goal) which can be incorporated into existing and future NASA concepts.

State of the Art and Critical Gaps

State of the Art: NASA has been researching advanced air transportation concepts and technologies to improve commercial operations in the National Airspace System.

Critical Gaps: Significant challenges remain in integrating air transportation technologies across different domains and operators (e.g., airport surface and terminal area; airport authority and air navigation service providers; etc.) providing comprehensive, strategic scheduling and traffic management technologies, enabling concepts that will allow for increased demand and complexity of operations.

Relevance / Science Traceability

Airspace Operations and Safety Program (AOSP) within Aeronautics Research Mission Directorate (ARMD).

Successful technologies in this subtopic have helped to advance the air traffic management/airspace operations objectives of the Program, and enable successful technology transfer to external stakeholders (including the Federal Aviation Administration and the air transportation industry).