



NASA SBIR 2019 Phase I Solicitation

A3.02 Increasing Autonomy in the National Airspace System (NAS)

Lead Center: ARC

Participating Center(s): LaRC

Technology Area: TA15 Aeronautics

NASA's future concepts for air transportation (2025+) will significantly expand the capabilities of airspace and vehicle management and are anticipated to increasingly rely on autonomy and/or artificial intelligence to ensure safe and equitable operations. Such future concepts propose a seamless, integrated, flexible and robust set of systems that are anticipated to include all vehicle types (traditional as well as novel vehicles); all airspace domains; all mission types; and accommodate changes to a diverse range of environmental and operational conditions while maintaining expected safety levels.

NASA's work in this area related to either transition or end-state autonomous airspace include:

- Data mining, application of machine learning and data science to air transportation data and problems
- Transition of largely human-centric systems to human-autonomy teaming systems
- Autonomy/autonomous technologies and concepts for trajectory management and efficient/safe traffic flows
- Weather and environment-integrated flight planning, rerouting, and execution
- Fleet, crew, and operator management to reduce the total cost of operations
- Graceful, manageable degradation in off-nominal conditions

This subtopic is seeking proposals to advance the future air transportation system (beyond 2025) that will apply novel and innovative techniques, methods, and approaches, to developing tools and/or technologies that will enable the successful transition to, or be an integral component of, the eventual realization of any autonomously operating airspace system in all airspace domains, from one in which human operators and decision-makers play a significant role.

This subtopic is also particularly interested in proposals focused on the application of advanced data science, and unconventional data or information sources, towards air traffic management (ATM) problems while incorporating meaningful ATM domain knowledge for more sophisticated results.

Relevance to NASA

Airspace Operations and Safety Program (AOSP) <https://www.nasa.gov/aeroresearch/programs/aosp>
Successful technologies in this subtopic have helped to advance the air traffic management/airspace operations objectives of the Program. The technologies also introduce new autonomy/artificial intelligence/data science methods and approaches to air transportation problems for current and near-future application.

