



NASA SBIR 2019 Phase I Solicitation

A3.04 Non-Traditional Airspace Operations

Lead Center: ARC

Participating Center(s): LaRC

Technology Area: TA15 Aeronautics

NASA is exploring airspace operations incorporating unmanned vehicles and novel operations occurring in all airspaces (controlled and uncontrolled), with a goal to safely and efficiently integrate with existing operations and mission types.

NASA's work in this area has already demonstrated the potential benefits and capabilities of a service-based architecture (such as developed for the Unmanned Aircraft Systems Traffic Management [UTM] R&D evaluations), and has led to new procedures, equipment and operating requirements, and policy recommendations, to enable widespread, harmonized, equitable execution of diverse unmanned missions.

This subtopic is seeking proposals continuing to support and develop the UTM concept, which seeks technologies to enable safe, heterogeneous (manned/unmanned) operations including, but not limited to, the following:

- To demonstrate the scalability of the UTM concept to potentially 10M+ users/operators
- To enable low size, weight, and power sense-and-avoid technologies
- The development of UTM-focused track and locate functions
- Autonomous and safe UAS operations for the last and first 50 feet, under diverse weather conditions.

This subtopic also seeks proposals supporting the Urban Air Mobility (UAM) concept, which seeks technologies including, but not limited to, the following:

- Service-based architecture designs that enable dense urban mobility operations and/or increasingly complex operations at ultra-high altitudes.
- Dynamic route planning that considers changing environmental conditions, vehicle performance and endurance, airspace congestion, and traffic avoidance.
- Dynamic scheduling for on-demand access to constrained resources and interaction between vehicles with starkly different performance and control characteristics.
- Integration of emergent users with legacy users, large commercial transport, including pass-through to and from ultra-high altitudes and interactions around major airports.
- Operational concepts for future vehicle and missions, including vehicle performance, vehicle fleet and network management, market need and growth potential, for future operations and airspace integration.
- Identification of potential certification approaches for new vehicles (such as electric vertical take-off-and landing-VTOL)

The expected TRL for this project is from 1 to 4.

References:

- <https://www.nasa.gov/aeroresearch/programs/aosp>
- <https://www.aviationsystemsdivision.arc.nasa.gov/publications/index.shtml>
- <https://www.aviationsystemsdivision.arc.nasa.gov/index.shtml>