Decision Making Planning Tool for Addressing Interaction of Urban Air Mobility and Smart City Technologies

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ABSTRACT

NASA, in collaboration with the industry and FAA, is conducting research on Urban Air Mobility (UAM). UAM introduces unique and evolving operational characteristics unaccounted for within current transportation planning tools. This evolving modality requires a unique and comprehensive tool that integrates new and existing planning methodologies to provide a holistic solution for decision makers.

NASA has identified a number of barriers and research areas related to aircraft, airspace, and communities as well as infrastructure requirements. The research will identify requirements related to urban capable aircraft and airspace technologies. While civil aviation authorities are responsible for safety and structure of operations through the air, the local and regional authorities are responsible for decisions related to location of vertiports, helipads, and airports.

The implementation of UAM vertiports will consider diverse regional system categories such as weather, airspace restrictions, noise acceptability, surface traffic, availability of power, vertipad locations, routes, impact on surface traffic, safety and risks, economic impact, ingress/egress for electric/hybrid VTOL aircraft, applicable fire codes, evacuation strategy, zoning requirements, emergency preparedness, interactions with surface traffic, and community acceptance. Therefore, regional implementation bodies need a decision making tool to assess systemic dependencies in preparation for UAM impact on the region. We are developing a simulation and modeling tool that allows regional authorities to consider many factors while deciding the location of vertiport and UAM operations.

The objective of this paper is to present the conceptual design of a comprehensive decision making tool to assist planning bodies in developing UAM infrastructure. Specifically, the UAM planning tool

will simultaneously consider all relevant local/regional considerations to identify for vertiport locations and UAM operations for a region.