

AIRSPACE PRIORITIES FOR NOVEL AIRCRAFT CERTIFICATION

Opinion Paper by the AIAA AAM and Certification Task Forces
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For a truly functional aerospace industry of the future, national air traffic control operations should anticipate an increase of the vehicle population up to 10 times what is currently present.¹ The successful integration of novel aircraft requires future-proofing laws regarding use of the national airspace for the advanced air mobility (AAM) ecosystem to function. Given the expected and significant increase in air traffic density, the need will arise for the FAA to consider a broader approach to incremental changes to the air traffic management system.

For the past two years, the American Institute of Aeronautics and Astronautics (AIAA) commissioned AAM and Certification Task Forces, cohorts of aerospace experts involved in public and private enterprise. Their objective was to propose an actionable plan drawing upon *Advancing Aerial Mobility: A National Blueprint*,² a report published in 2020 by the National Academies of Sciences, Engineering, and Medicine. The following recommendations lay the groundwork for future advances in the AAM ecosystem, focusing jointly on requirements for safe air traffic control and standards for type certification of AAM aircraft, as well as avionics and mechanical systems.³

Priority 1:

Expand the collection and dissemination of experimental data demonstrating the inclusion of novel aircraft in air traffic management (ATM) operations.

Rationale: The AAM ecosystem consists of a complex interplay of aircraft requiring operation outside of standard take-off and landing environments, requiring the necessity of flexibly and safely accommodating a new microset of vehicles.

Actions:

- › Enable innovation by introducing standards that align with rigorous safety assessments as a means of compliance.⁴
- › Model the future system by cataloging and addressing the needs of the future users, as well as the estimated economic impact of each class of vehicle. The future ATM system will need to accommodate a mix of large passenger carrying airliners, crewed conventional and EV air taxi airplanes and helicopters, and drone delivery systems of several sizes. Assess each of the ATM needs and how an integrated system could optimize the airspace system as a utility (similar to FCC frequency allocation).⁵
- › Evaluate current air lane structure and explore development of a universal networked avionic solution with autonomous features that accept disparate air vehicles and ensures safe navigation.

[1] Department of Transportation, Federal Aviation Administration, 2024. *FAA Aerospace Forecast FY 2024–2044*. <https://www.faa.gov/dataresearch/aviation/aerospaceforecasts/faa-aerospace-forecasts.pdf>.

[2] National Academies of Sciences, Engineering, and Medicine, 2020. *Advancing Aerial Mobility: A National Blueprint*. Washington, DC: The National Academies Press. <https://doi.org/10.17226/25646>.

[3] American Institute of Aeronautics and Astronautics, 2025. *Challenges to the Commercialization of Advanced Air Mobility*. <https://www.aiaa.org/resources/challenges-to-the-commercialization-of-advanced-air-mobility>

[4] Department of Transportation, Federal Aviation Administration, 2009. 14 CFR Parts 1, 21, 43, and 45 [Docket No. FAA-2006-25877; Amendment Nos. 1-64, 21-92, 43-43, and 45-26] RIN 2120-AJ44. Production and Airworthiness Approvals, Part Marking, and Miscellaneous Amendments. <https://www.federalregister.gov/d/E9-24821>.

[5] United States Government Accountability Office, 2023. "Drones: FAA Should Improve Its Approach to Integrating Drones into the National Airspace System." <https://www.gao.gov/products/gao-23-105189>.



Priority 2:

Convene a body of decision makers from multiple public and private organizations to lead progress on AAM operations, setting a consensus-developed roadmap for near-, mid-, and far-term goals.

Rationale: Multiple government agencies and private actors make decisive contributions to the evolution of the advanced air mobility ecosystem but often make their contributions without awareness of the full context.

Actions:

- › Establish guiding principles for roles and responsibilities for AAM infrastructure and operations in non-safety-critical areas for new type certification entrants into the national airspace.⁶
- › Determine a maximum allowable audible noise ceiling for electromechanical sources to enable public acceptance of an increase in air vehicles.
- › Standardize AAM operations through battery charging infrastructure at domestic airports to enable use of electric vertical take-off and landing (eVTOL) aircraft.

Priority 3:

Identify and address knowledge gaps in AAM operations and geographic expansion based on modeled and tested feasibility.

Rationale: Acknowledging both domestic patterns and regional variations is a critical part of setting up replicable processes and compliance procedures. Active modeling and testing will enable problems to be addressed in real time before further scaling occurs.

Actions:

- › Create environments to support knowledge sharing among AAM operators in test regions, beginning with the Uncrewed Traffic Management Key Site in North Texas.
- › Incentivize training and hiring of state-level officials with vertical flight and vertiport backgrounds.
- › Identify standardized and equitable pathways for the future workforce and new entrants to gain understanding of pilot and aircraft certification requirements through mentorship and training.

The AAM ecosystem stands to benefit Americans every day through the greater accessibility of goods and services across multiple industries. However, novel aircraft will only be able to benefit Americans with the rigorous testing of ATM systems with greater agility. Enabling flexible ATM systems is key for the United States to maintain its record of safe flight while expanding pathways to certification of novel aircraft.

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[6] Department of Transportation, Federal Aviation Administration, 2021. 14 CFR Part 107 [Docket No. FAA-2021-1158; Notice No. 107-21-01-NOA]. Accepted Means of Compliance; Operations Over Human Beings, Category 2 and Category 3 Small Unmanned Aircraft. <https://www.federalregister.gov/d/2021-27188>.