AVIATION
PLATFORM PAPER 2025

As the first country to prove that aviation is possible, the United States has led the world in advancing aeronautics technology and providing opportunities for all to take advantage of civil and commercial air transportation to improve their lives. Aviation positively and meaningfully impacts American lives every day through professional travel, package and cargo delivery, and tourism. In industries as varied as agriculture, infrastructure testing, firefighting, and medicine, aerial processes assist in maintaining the safety of operators and the communities they serve. For decades, the United States has held a competitive edge in emerging aeronautics technology. However, maintaining this leadership position in aeronautics technology development and operations on a global scale will require policy and regulatory action.

KEY POINTS

MAINTAIN U.S. LEADERSHIP IN INNOVATIVE AIRCRAFT DESIGN AND OPERATIONS

New aerial technologies are currently in development and testing phases to modernize air transportation, from small part 107 drones to supersonic passenger travel. These novel aircraft systems require reconsideration and mapping of national airspace in diverse ways, particularly as novel aircraft fly closer to private homes than ever before. Public acceptance of novel aerial hardware and software systems will require demonstration of safety and a widespread appreciation of use cases so that Americans will feel safe when drones and other novel aircraft are seen nearby.

Creation of a dynamic environment for advanced air mobility (AAM) manufacturers and operators alike requires an agile National Airspace System (NAS); the training of an agile workforce prepared for crewed, remotely piloted, and increasingly autonomous systems; and capacity building at state, regional, and federal levels to understand and enable the evolution in operations and infrastructure. The recent release of the Special Federal Aviation Regulation for electric vertical take-off and landing aircraft (SFAR for eVTOL) and the EB (Engineering Brief)-105A Vertiport Design guidelines are significant first steps toward enabling the commercialization of a new form of air transportation and should be lauded.

Innovative design and operations include the opportunity for commercial aircraft to fly faster. Technologies have existed to transport people and payloads at rapid speeds for decades in civil and defense environments, but the high-speed flight industry has experienced decades of volatility in the market due to operational costs and acoustic concerns. Increased support of fuel-efficient design and testing, consideration of alternate energy sources, and constituting a less-disruptive altitude in the NAS will create new possibilities to operate at high-speed.

OPTIMIZE FUEL EFFICIENCY IN AIRCRAFT DESIGN

Optimization of aircraft propulsion systems and supporting ground infrastructure are jointly necessary to ensure that domestic transportation systems are prepared to support an increase in the number of passengers and flights. These scaled stresses on the power grid require developing more fuel-efficient aircraft and considering alternate sources of power, including hybrid-electric and hydrogen-based systems.

Hydrogen is a fuel source with energy density and availability like current airplane and helicopter fuel. Electric propulsion, especially when sourced with a combination of batteries and hydrogen, enables the development of novel, highly efficient aircraft types. Multiple American companies are in testing and demonstration phases of hydrogen-fueled and electrified aircraft. Enabling their work through novel aircraft certification pathways and approval of infrastructure development at airports for these energy sources will hasten the ability of adoption and operations. Upgrading the electric grid infrastructure to airports and vertiports to support the required power/energy requirements of these vehicles is critical to scaling development and operations.

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KEY POLICY ISSUES

A. **Aircraft design for fuel efficiency**
To increase fuel efficiency, aircraft must be designed with materials compatible with advanced propulsion systems and alternative fuel sources. Successful designs require research into current and advanced material needs, testing aircraft designed with new materials, and reliable supply chains. In addition to preparing aircraft for an aerospace market that is in the process of pivoting from full reliance on traditional jet fuel, these considerations will be necessary to meet current targets for emission and general contrail reductions. As part of increasing operational efficiency, prioritize funding Airport Improvement Program (AIP) projects that provide for electric grid resilience and support infrastructure for the electrification of various multimodal transportation options, including aircraft charging, efficient ground transportation, and public transportation connections.

B. **National coordination of novel aircraft integration into the National Airspace**
A roadmap is needed for guidance on implementing low-altitude air traffic control, defined as NAS below 400 feet or as part of the NAS below 3,000 feet. This roadmap should include a minimum set of infrastructure requirements for maintaining safe operating conditions from early adoption to full-scale operations over time, including spectrum assignments, weather data, and emergency rerouting rules for deconfliction. These requirements will provide clarity and stability for the industry and enable private investment to prepare for passenger and cargo operations.

C. **Enable public acceptance of autonomous flight**
Finalizing the Beyond Visual Line of Site (BVLOS) rules and policies for low-altitude remotely piloted vehicles is desperately needed to open new commercial opportunities. Multiple drone corridors have been approved around the United States for flight simulations and air traffic training to adjust to the use of uncrewed missions for cargo, infrastructure inspections, and short-haul or last-mile payload deliveries. Supporting these simulated environments through public advocacy, investment, and defining goals for success will provide operational pathways.

D. **Revitalize commercial high-speed flight operations**
Revitalization of the high-speed flight industry requires investment in risk-reduction demonstrator programs, showing key public and private stakeholders that flying quickly, efficiently, and safely is possible. Commercial supersonic flight has been limited to overwater operations to avoid the ground impacts of sonic boom, but the NASA X-59A has been studying methods to reduce the effect of sonic boom on the ground. Continued funding for this program and support for simulated high-speed flight environments will yield important data necessary to scale the development of feasible aeronautics technologies leading to a more efficient air transportation network.

E. **Balance civil versus defense concerns for aerospace innovation**
There are multiple sources of innovative technologies receiving government agency support, but the timeline between consideration for defense and civil uses regularly stretches due to a lack of communication between research and industry functions. The government should support efforts to consider emerging aerospace technologies for all potential uses and provide pathways for innovative solutions to be considered across industries. Expanding public awareness of air shows and drone demonstrations and enabling access to said demonstrations by new entrants will support business development and demand alike.

Thank you for the opportunity to share some considerations from AIAA. Our network of professionals is on standby to offer expert support to further U.S. interests in aeronautics.

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