

# U.S. Policy Trends on Advanced Air Mobility: Part 2

Shinichiro Tsuru, Japan International Transport and Tourism Institute, USA

## 1. Overview

From November 2023 to February 2024, the Federal Aviation Administration (FAA) and the Department of Transportation (DOT) Volpe Center (a transportation research institute in Massachusetts under the DOT), in cooperation with the DOT Office of the Under Secretary for Policy, jointly hosted a 7-session online event series on Advanced Air Mobility (AAM) titled “Up, Up, and Away: Innovations in Advanced Air Mobility.”<sup>1</sup> This online event involved panel discussions by government officials and industry leaders with a specific AAM-related theme for each session; a final report of the sessions was compiled in April 2024.<sup>2</sup> This paper will provide an overview of the key points from each of the seven sessions.

## 2. Online Event Series— “Up, Up, and Away: Innovations in Advanced Air Mobility”

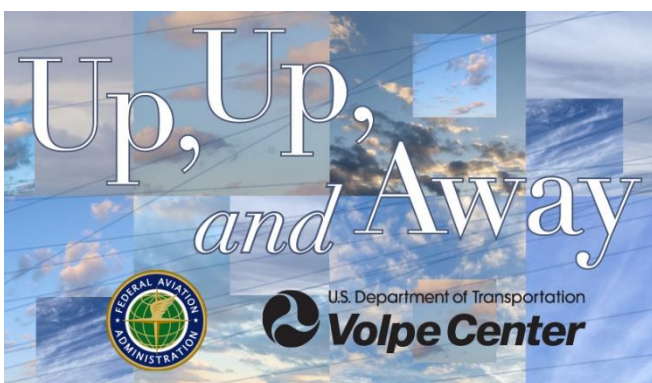


Figure-1: Header Image of the Series

Source: The DOT Volpe Center's website for this event<sup>1</sup>

This online event was held over a total of seven sessions, with the topics set for each session discussed under the moderation of Anne D. Aylward, Director of the DOT Volpe

Center. A summary of the sessions is provided below.

### 2.1 Session 1: Innovations

The first meeting, held on November 30, 2023, kicked off the series with a discussion on “Innovations in AAM.” During the discussion, DOT Under Secretary of Transportation for Policy, Carlos Monje, shared the status of activities to develop a national strategy for AAM, which was mentioned in my previous report.<sup>3</sup> He also noted that more than 450 comments have already been received in response to the Request for Information (RFI). Monje touched on the division of roles among the five subgroups under the Advanced Air Mobility Interagency Working Group (AAM IWG)—Automation Strategy, Security Requirements, Air Traffic Federation, Infrastructure Development, and Community Roles— and the August 2024 deadline set by Congress for the development of a national strategy, among other things.

Additionally, Elan Head, Senior Editor of The Air Current, a subscription-based reporting and analysis service for the aerospace industry, compared AAM to the airship business her great-great-grandfather was involved in, and cited three lessons she has learned about the success of AAM: (1) the importance of customer support, (2) the role of infrastructure networks, and (3) the need for operational safety.

Regarding (1), historically, the operation of airships was supported at the highest levels of the U.S. Navy, but there was little support at the field level—the actual customers—and funding was not sustained. Applying this to AAM, the electric Vertical Takeoff and Landing (eVTOL) aircraft companies have so far gained the support of senior government officials, but from the perspective of the end users, the customers, there is some opposition to AAM in

cities such as Los Angeles and Paris. She stated that the support of such customers is necessary for the sustainable development of AAM.

Regarding (2), one of the reasons airships have not been commercially successful is that they require infrastructure that is much more costly than airplanes, such as tall mooring masts of lifting gas stations in addition to fuel stations, and enormous hangars at their regular bases to shield them from the weather. Fortunately, eVTOL aircraft require much less infrastructure than airships, she explained, and the success of AAM depends on whether local communities will allow such an infrastructure network to be built and whether a critical mass of passengers and vertiports (airports for vertical takeoff and landing) can be reached.

In regards to (3), the USS Akron, a U.S. Navy rigid airship, should have been a safer aircraft than the exploding Hindenburg because it used helium as its lifting gas, rather than the hydrogen. However, in Akron's 1933 crash, most of the crew drowned from hypothermia due to operational reasons, such as the lack of life jackets. This shows that it is difficult to ensure the safety of AAMs solely through the design of the aircraft, and that a comprehensive approach, including operational aspects, is necessary. This can require conservative and sometimes unprofitable operations.

## 2.2 Session 2: Safety

The second session, held on December 7, 2023, discussed the topic of "Safety and AAM." Cindy Comer, Director of Certification and Safety Management Systems for the eVTOL aircraft manufacturer Wisk, said that safety is the company's absolute top priority and that the company has confirmed the safety of its autonomous flight technology through simulations and test flights. She also said that the company is certifying its sixth-generation aircraft as a Part 23 aircraft (normal category airplanes), and that the company also plans to obtain Part 135 FAA certification for commercial operations.

Eric Allison, Head of Product for the eVTOL aircraft manufacturer Joby Aviation, pointed out that traffic congestion wastes about 4.6 billion hours each year in the

top 10 U.S. cities, creating a huge opportunity for AAMs to save people time and improve their quality of life. He also noted that to meet this demand, AAMs need to have the right payload, range, speed and quietness. In addition, Blaine Newton, Chief Operating Officer of BETA Technologies, a company developing eVTOL aircraft and charging infrastructure, shared that the company has developed an interoperable, multi-modal, industry-standard charging infrastructure that can be used for a variety of electric mobility devices, both land-based and air-based. He expressed the company's commitment to meeting the FAA's goal of maintaining the safest airspace in the world.

## 2.3 Session 3: UAM ConOps

The third session, held on December 19, 2023, was titled, "Transformation: Urban Air Mobility Concept of Operations" (UAM ConOps). During the meeting, Paul Fontaine, FAA Assistant Administrator for Next Generation Air Transportation Systems (NextGen), stated that NextGen is a central player in AAM at the FAA, and will help organize and coordinate a wide range of activities across the FAA necessary to support the development and implementation of the ecosystem required for AAM. He then mentioned the announcement of UAM ConOps v1.0 in 2020 and UAM ConOps v2.0 in 2023, both of which were introduced in my earlier report.<sup>3</sup>

Steve Bradford, Chief Scientific and Technical Advisor (CSTA) for FAA Architecture and NextGen Development, also noted that as a wide variety of aircraft, including UAMs, begin to operate in the U.S. National Airspace System (NAS), there will be an increasing need for Extensible Traffic Management (xTM), i.e., traffic management encompassing UAS Traffic Management (UTM) for Unmanned Aircraft System (UAS) operations, including airspace below 400 feet altitude, traffic management for UAM/AAM described in UAM ConOps, and Upper Class E Traffic Management (ETM) for supersonic aircraft etc. that can fly in the airspace above 60,000 feet altitude, which complements traditional Air Traffic Services (ATS), as described in my previous report<sup>3</sup>.

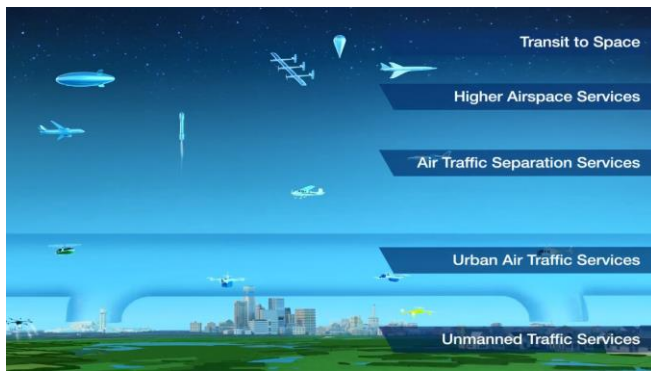


Figure-2: Various aircraft operations at the NAS

Source: Same picture as the one in Bradford's presentation slides, taken from the FAA website<sup>4</sup>

#### 2.4 Session 4: Environmental Responsibility

At the fourth session, held on January 17, 2024, the discussion focused on the theme “Environmentally Responsible AAM.” In her remarks, Julie Marks, Acting Executive Director of the FAA Office of Environment and Energy, noted that her office and other FAA members are working to reduce the environmental impacts of AAM, such as noise, through initiatives like Innovate 28 (FAA's initiative to achieve AAM operations by 2028) and other programs. She went on to state that the FAA conducts environmental reviews as part of AAM-related activities, such as vertiports at federally funded airports. In other cases, once a state, local or tribal entity decides to operate AAMs, then they, along with vertiport operators and AAM operators, will be responsible for environmental considerations in community engagement.

Dr. Christopher Roof, Chief of the DOT Volpe Center's Environmental Measurement and Modeling Division, discussed the Center's support for aircraft noise certification and noise modeling techniques, while Dr. Stephen Rizzi, Senior Researcher for Aeroacoustics at NASA's Langley Research Center, introduced a software tool developed by NASA for VTOL/eVTOL noise level analysis.

#### 2.5 Session 5: Considerations for Equity

The fifth session, held on January 23, 2024, dove into the topic of “Considerations for Equity in AAM.” In her talk, Yolanka Wulff, Executive Director and Co-Founder of the Community Air Mobility Initiative (CAMI)—a non-profit

organization that supports AAM implementation—and a member of the Advanced Aviation Advisory Committee (AAAC), explained the concept of equity in AAM in terms of STEPS (an acronym for Spatial, Temporal, Economic, Physiological, and Social barriers). For example, low-income people who work in essential services may live far from their workplaces and may not have access to cars or affordable parking, and therefore need to travel by public transportation during off-peak or late-night hours, which can result in disparities in the transportation network at certain times of day and temporal barriers.

Okeoma Moronu, Head of Global Aviation Regulatory Affairs for the drone company Zipline International, highlighted the company's experience in transporting goods by fixed-wing drones, including a delivery service in the Goto Islands, Japan. She explained that delivering medicines can have a positive impact on entire communities that have traditionally been underserved, such as reducing maternal mortality rates due to postpartum hemorrhage. She also shared that the company has partnered with universities to build a pipeline of candidates who were previously ineligible for aviation work due to an inability to meet medical requirements or a lack of resources to receive training.

#### 2.6 Session 6: International Collaboration

The sixth session, held on February 6, 2024, discussed “International Collaboration in AAM.” In her segment, Annie Petsonk, DOT Assistant Secretary for Aviation and International Affairs, stated one of the DOT's visions is for the United States to remain the global leader in AAM, as it has been in aviation for the past century. She then mentioned initiatives around the world, such as Japan Airlines' goal of commercializing air taxi services using eVTOL aircraft from 2025, as well as the activities of the AAM IWG, which was established based on the Advanced Air Mobility Coordination and Leadership Act, introduced previously<sup>3</sup>, and the U.S. participation in the International Civil Aviation Organization's (ICAO) Advanced Air Mobility Study Group.

Chris Carter, the Director of the FAA Asia Pacific Region, also introduced the International Air Transport

Association's research showing that Asia Pacific is expected to be the fastest growing region in terms of passenger traffic over the next 20 years, and a Rolls-Royce study showing that by 2050, the region could have 82,500 eVTOL aircraft (1,000 of which will be in service by 2030), which would account for more than half of all eVTOL aircraft in operation worldwide and more than 40% of the global revenue. He then stated that the FAA has a wealth of data and experience about aviation from the past 120 years to share with the Asia Pacific region, and that by not only sharing but also learning from the region's experiences, the FAA can lead the world.

Ms. Lirio Liu, Executive Director of the FAA's Aircraft Certification Services, further explained how aircraft certification validation works, utilizing audits by the designing authority, and mentioned that the FAA currently has Bilateral Aviation Safety Agreements (BASA) or Bilateral Airworthiness Agreements (BAA) (concluded before 1996) with 19 countries, including Japan, and also has declarations of cooperation with both Japan and Korea to share information gained through AAM activities.

### 2.7 Session 7: The Workforce of the Future

In the seventh and final session, held on February 15, 2024, the discussion focused on "The AAM Workforce of the Future." In his talk, Laurence Wildgoose, FAA Assistant Administrator for Policy, International Affairs, and Environment, said that the FAA always needs engineers and scientists, as well as people with all skill sets, including policy, communications, accounting, and financial management professionals and lawyers, and that the AAM workforce must be diverse and that no person, skill set, or perspective should be excluded.

Dr. Becky Lutte, Chair of Graduate Studies and Associate Professor at Embry-Riddle Aeronautical University College of Aviation Worldwide, noted the need to address three areas: workforce development, training and education, and research. For example, she noted that youth under the age of 10 are important for outreach, and that instead of focusing on STEM (Science, Technology, Engineering and Mathematics), the emphasis should be on what she referred to as the "cool factors" that attract people

to aviation, such as fun, passion for the field, excitement, and a desire for challenge. She also suggested that there is room to increase the number of women and certain ethnic minorities that are underrepresented in the aviation workforce.

In addition, Robin Riedel, Partner of Aerospace & Defense, Travel, Transportation & Logistics, and Sustainability at the McKinsey Center for Future Mobility, mentioned major trends emerging in the aviation industry, namely the electrification of aircraft, the digitalization of operations and services, new customized and digitalized learning methods, sustainability, and shared mobility. He emphasized that new skills will be required for the workforce to keep pace with these trends.

For example, he explained that in aircraft design, the engine has traditionally been designed independently of other systems, but with electrification, the engine will be more integrated with the aircraft and different skill sets will be required. If the only focus is on city-to-city operations using electric aircraft, pilots will no longer need knowledge of high-altitude aerodynamics, jet engines, or global weather patterns, and because aircraft automation will simplify operations, it could reduce the time required for training.

He then mentioned two tailwinds in terms of future aviation talent. One is that, if the costs and time required for training could be reduced, as in the example of pilots mentioned above, it would open the doors to this profession to people with a variety of socio-economic backgrounds and family situations. The other is that, for pilots, who tend to spend long periods away from home, AAM can offer an opportunity of a local job with shorter hours, which will increase the attractiveness of aviation to people. However, he also pointed out a headwind in that "social media influencer" and "software engineer" are ranked high on the list of careers that children want to pursue, while "astronaut" and "pilot" are ranked much lower on the list. The panelists expressed their belief that the aviation industry needs to do more outreach to change this.

### 3. Summary

This report provided an overview of the “Up, Up, and Away” online event series on AAM hosted by the FAA and DOT. The speakers were from a wide range of departments, giving a sense of the federal government's approach to AAM. In addition, the event provided an excellent opportunity to get a big-picture view of AAM in the U.S., including what vision the authorities have in designing the system and how the industry is analyzing and developing its business from various perspectives such as safety, environmental compatibility, international cooperation, and human resources. I will continue to closely follow the progress of AAM initiatives in the U.S. and the national strategy on AAM that is scheduled to be developed in 2024.

## References

1) DOT Volpe Center, Up, Up, and Away: Innovations in Advanced Air Mobility

<https://www.volpe.dot.gov/events/and-away-innovations-advanced-air-mobility>

2) DOT Volpe Center, Up, Up, and Away: Innovations in Advanced Air Mobility Final Report

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4) FAA, Info-Centric NAS Tech Talk

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