



DIRECTORS GENERAL OF CIVIL AVIATION-MIDDLE EAST REGION

Seventh Meeting (DGCA-MID/7)
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Agenda Item 4: Aviation Safety and Air Navigation

INTEGRATING ADVANCED AIR MOBILITY (AAM) INTO EXISTING AIR TRANSPORTATION SYSTEM

(Presented by Airports Council International (ACI))

SUMMARY

Significant investments are being made in the development of Advanced Air Mobility (AAM) sector. As the sector will move from concept to reality in the coming years, the aviation industry will need to address challenges around infrastructure, energy and utilities, certifications, societal acceptance, noise management, and regulatory developments. This paper highlights the opportunities and some key domains for consideration to facilitate the development of AAM. Harmonised standards, certifications and supportive policy frameworks to regulate the AAM sector are advocated.

1. INTRODUCTION

1.1 Advanced Air Mobility (AAM) implies the emergence of disruptive new airborne technologies that will serve as an extension of the aviation ecosystem designed to transport people and objects to locations either not traditionally served by existing modes of transportation or to compete with other existing modes of transportation.

1.2 In recent years, there has been noticeable growth in the developments of electric and hybrid aircraft for urban, suburban, and rural operations, in both controlled and uncontrolled airspace. In particular, the emergence of electric-powered Vertical Take-off and Landing aircraft (eVTOL) is exponential.

1.3 These technologies can be piloted, piloted remotely, or can even operate autonomously, relying on the use of uncongested, low-altitude airspace. The initial operating models focus on delivering packages, cargo and medical supplies in the urban and suburban environments, with the plan to begin carrying passengers, typically between two and six.

1.4 Significant investments are being made in the development of AAM. Globally, it is estimated that more than USD 6 billion was invested in the AAM sector in the midst of the COVID-19 pandemic, with the potential that the sector can grow to become a USD 500 billion plus industry annually by 2040. A growing number of markets within our region are actively looking into developing AAM, with some target to launch operations by 2025.

2. OPPORTUNITIES AND ADVANTAGES OF AAM

2.1 AAM's value proposition leverages a variety of advantages, such as enhanced transportation efficiencies, reduced commuting time, decreased road congestion in urban areas and offer effective transportation alternatives to remote and geographically challenging areas.

2.2 AAM commonly uses electric and hybrid aircraft, technologies that offer opportunities to achieve faster and lower (or zero) emission journeys and to provide for smarter use of urban infrastructure. AAM will help the aviation industry to advance in decarbonisation and create a more sustainable aviation ecosystem.

2.3 This new form of transportation generally has lower carbon emissions and are quieter compared to conventional aircraft or ground vehicles powered by fossil fuels. Integration of AAM into existing industry operating and business models, can bring about added value to local communities, businesses, as well as facilitating the social movement towards sustainable travel.

2.4 AAM also play a role in creating a more dynamic and innovative image of aviation as it embraces disruptive ideas and solutions for transportation. AAM can be seen as a unique opportunity to attract younger generations to join the industry, offsetting some of the workforce pressures that the industry is encountering. AAM can be portrait as "new aviation" that can attract high-quality, technology-focused people to join the industry.

3. KEY DOMAINS FOR CONSIDERATION TO FACILITATE AAM DEVELOPMENT

3.1 As AAM will move from concept to reality in the next few years, the aviation industry will need to address challenges around infrastructure, energy and utilities, certifications, societal acceptance, noise management, and regulatory developments.

3.2 Some key domains that the industry needs to consider carefully in order to facilitate the AAM sector to develop:

a). **Infrastructure** - The key challenges lie in integrating new infrastructure or adapting existing infrastructure to allow AAM operations. The infrastructure enabling AAM to exist will need to take into account of the apron areas or stands for handling of the aircraft, aircraft hangars and maintenance areas, as well as associated charging infrastructure. Additionally, AAM operations must take into consideration of surrounding physical constraints such as towers, power lines, cranes and communication facilities.

b) **Energy and utilities** – AAM will create added demand for electrical energy storage and charging infrastructure. Availability and lead time for components required to build the charging stations and supply the electricity necessary to support the landing and take-off sites will be a concern in the future, and will put increased pressure on electrical power grids. Infrastructure required to enable rapid battery swapping, and/or extremely fast and high-power charging are critical. There are needs to consider ways to streamline processes and future developments in this domain.

c). **Regulatory frameworks** – In most markets, the standards and regulatory frameworks for AAM integration, operations, airspace access, training, pilot and equipment certification, environmental impacts and infrastructure are still being developed. Given the rapid rate of growth and innovation, and the amounts of investments poured into the sector, there is currently a disjointed approach to the development in this domain to safeguard the safety and security. The development of reliable and robust systems, the establishment of appropriate safety standards, and the creation of training and certification programs are essential. Security is also a critical consideration when it comes to integrating AAM with conventional air transportation. This includes the need for secure communication and data systems, the establishment of appropriate security protocols and regulations against potential threats.

d). **Air Traffic Management (ATM)** - The growth of the AAM sector will in part come with the development of new vertiports in urban and suburban areas. The regulatory framework must harmonise these infrastructure developments and accommodate the seamless integration of AAM traffic into existing air traffic flows. Regulations in this domain will not be a simple adaptation of existing airports and ATM rules. Current air traffic management concepts will need to be reviewed to ensure smooth and seamless integration of AAM operations, and when necessary, deconflict multiple aircraft trajectories.

e). **Sustainability and public acceptance** - This is critical in ensuring adequate planning and anticipating the requirements that will facilitate and enable economic growth and mobility of the communities. Identifying the needs of local communities will facilitate AAM operations to be integrated into the master planning activities, sustainability strategies and to bolster social acceptance, particularly in relation to privacy, visual, noise and various non-acoustic factors. Also, AAM's focus on electrification power sources comes with infrastructure implications that need to be anticipated, consulted and coordinated with local communities prior to implementation.

4. ACI'S POSITION ON AAM

4.1 Overall, ACI supports the development of this new sector of the aviation system as there are many advantages that can be gained through the implementation and growth of AAM. Airports can utilise this exciting new opportunity and integrate this into their operating and business models.

4.2 AAM aircraft manufacturers should ensure compatibility of their aircraft with current and future airport infrastructure and operating models. Airport operators should be made aware of the performance of the equipment needed to service AAM aircraft that will be taking off and landing at their airports.

4.3 AAM aircraft should be conceived to operate at the highest safety standards applicable at airports. AAM operations should not bring new aviation security risks to airports. Airport operators should take into consideration the potential security risks, including cybersecurity.

4.4 To integrate AAM operations into master plans, consider future infrastructure and operational requirements, including impacts on noise and capacity, for accommodating AAM aircraft, supporting systems, and technologies as part of their master planning process. Also, consider the needs for electrical and charging capabilities within their master plans to ensure that enough electrical capacity to cater AAM operations.

4.5 The current air traffic management processes will need to be reviewed and refined to ensure smooth integration of AAM operations.

4.6 AAM operations need to be considered in the medium-and long-term vision and planning of the airport operator's sustainability strategy. And shall consider the needs of local communities surrounding and within the airport's catchment area.

4.7 The AAM users should pay for the usage of the airport infrastructure (as per the user-pay principle), to cover the relevant costs (e.g., infrastructure, operations, maintenance etc.). Where applicable, airport operators should consider alternative aeronautical charging schemes for AAM operators.

4.8 Airport operators and AAM operators should seek to create seamless multimodal interfaces between ground and air transportation systems for both passengers and cargo.

4.9 Details of ACI's position on the development of AAM can be found in this policy brief available online [here](#).

5. ACTION BY THE MEETING

5.1 The meeting is invited to:

- a) acknowledge the huge investments being made in the development of AAM, and that AAM will be operational in coming years;
- b) acknowledge the needs for harmonised standards, certifications and policy frameworks to regulate the AAM sector that aim at bringing about the highest levels of safety and security, and ensure fair market access and competition, allowing the AAM sector to thrive and grow;
- c) call upon States to consider AAM operations in airport master planning;
- d) encourage States to undertake continuous, inclusive and pragmatic dialogue between stakeholders of the AAM sector, conventional air transport and local communities, to provide safe, secure, efficient, and sustainable mobility solutions for all; and
- e) encourage States to support and participate in the first ICAO Advanced Air Mobility Symposium (AAM 2024) from 9 to 12 September 2024, in Montreal, Canada.

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