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EXECUTIVE COMMITTEE

Agenda Item 23: Innovation in Aviation

LEGAL AND SOCIETAL STAKES FOR THE EMERGING AIR MOBILITY IN METROPOLITAN AREAS

(Presented by the International Coordinating Council of Aerospace Industries Associations (ICCAIA) and the Airports Council International (ACI))

EXECUTIVE SUMMARY

Urban Air Mobility (UAM) will provide future mobility for passengers and goods in cities and regions. It builds on the advancement of unmanned aircraft system technologies, electric vertical take-off and landing (e-VTOL) aircraft and digitalized air traffic management. The societal acceptance of UAM operations/services is an ever-increasing factor determining the success or failure of future 'urban commercial aviation' prospects. One aspect of concern relates to the role of non-aviation actors in the management of the very-low airspace that is considered by local authorities as an extension of the public space. Another aspect relates to the benefits of UAM operations/services as a complementary means of mobility to existing ground mobility systems. This has created an emerging multi-level governance issue whereby the responsibility for planning, development and ultimately management of very-low level airspace is not always clear.

Action: The Assembly is invited to:

a) explore strategies and measures for the potential modernisation of the airspace legal framework to address emerging multi-level governance issues in the context of future UAM services/operations and alignment needs across mobility sectors for future integrated mobility operations;
b) assess impacts on existing ICAO annexes with regard to multi-level governance of the very low altitude airspace and develop an action plan accordingly; and
c) consider a mechanism to bring together representatives of cities of the future, construction associations and aviation, including start-ups/scale up representatives, to align the specific roadmaps towards an integrated system of governance.

Strategic Objectives:	This working paper relates to Safety, Environment, Legal and Air Navigation strategic objectives.
Financial implications:	The activities referred to in this paper will be subject to the resources available in the Regular Programme Budget and/or from extra budgetary contributions. The financial implication to the International Civil Aviation Organization (ICAO) can be reduced through the advancements of studies and draft provisions prepared by the industry.
References:	

[1] English, Arabic, Chinese, French, Russian and Spanish versions provided by ICCAIA.

1. INTRODUCTION

1.1 It is widely envisioned that the use of unmanned aircraft and other air vehicles (e.g. manned electric vertical take-off and landing (e-VTOL)), designed for urban environments, will deliver societal benefits to municipalities and their citizens. These include positive economic, environmental, health and wellbeing outcomes, not only for the users of these services, but for society at large. However, the fact that these new aircraft can provide benefits does not guarantee that their services will be intrinsically embraced by society. Many stakeholders must work together to engage with the public, to ensure that these services are understood, embraced and even demanded by citizens. It is only with this approach that a genuine 'market pull' approach can be put in place, through which services can be introduced and scaled – truly unlocking the possibilities from the third dimension of mobility in cities and regions.

1.2 There is need for coordination among different authorities (aviation and non-aviation) for Urban Air Mobility (UAM)/drone very-low altitude flights above municipalities. UAM does not encompass only the aircraft or air traffic management systems, but it also encompasses the entire urban mobility ecosystem (i.e. surface and air segments). Thus, it includes various services, such as: integrated traffic management (ground and air), energy grid, integrated infrastructure with the ground transportation systems (e.g. intermodal hubs), information systems and ticketing. Airspace and aviation technology has developed through a process of continuous change and improvement. Throughout this evolution, the International Civil Aviation Organization (ICAO) has played a central role in achieving international consensus for the adoption of Standards that facilitate the implementation of globally harmonized and interoperable systems.

1.3 The sustainable and responsible integration of UAM in cities requires strong coordination and alignment among different aviation, ground mobility policies and stakeholders. The world's population is ever-concentrated in a few large urban and metropolitan areas of increasing size. This will pose challenges with regard to mobility, which is critical even today in very large cities. Mobility is a key societal need and a cornerstone of liveable and sustainable cities, and which ensures economic growth and social development and cohesion. Seamless, integrated, transport solutions to enhance people's and goods' mobility is high in the policy-making agenda and is pursued in several cities, regions and countries and among numerous cross-sectoral stakeholders.

1.4 In developing aviation mobility services in urban environments (i.e., UAM), there will be many factors that will have to be taken into account from a societal perspective, including safety, noise, visual pollution, wildlife protection, inclusion, affordability, life cycle assessment topics and privacy. Many cross-sectoral stakeholders must work together to engage with public authorities, entities and other private actors including citizens, to ensure that UAM services are responsibly developed, understood, embraced and even demanded by citizens. Such a collaboration will allow for a constructive dialogue leading to societal embracement, and a clear understanding by all on the specific mobility challenges being tackled, and the holistic benefits they bring to sustainable urban mobility. This kind of collaboration will also help UAM service developers understand the different mobility needs, safety and security concerns, regulatory aspects, planning regimes, decision making process, etc., that all vary from city to city and region to region.

2. DISCUSSION

2.1 Local authorities are the new stakeholder upon which the UAM/Unmanned aircraft systems (UAS) market development and societal acceptance depends on[2]. The governance of the very-low airspace

[2] European Commission Implementation Regulation of the U-Space, (EU) 2021/664
Article 18(f) of the EASA/ European Commission draft for Public Consultation of NPA 2021-14 (Acceptable Means of Compliance and Guidance Material)

over municipalities has been creating a debate among local authorities and aviation stakeholders (e.g. municipalities prohibiting drones flying above their territories). From the local authorities' perspective, low-level altitude airspace over cities is seen as an extension of public space that municipal authorities are responsible for. At the same time, national airspace makes no distinction on the altitude level and is all a responsibility of national aviation authorities. A mechanism needs to be developed to manage coordination among the different stakeholders to ensure alignment at all levels of governance.

2.2 A clear legal framework is required to modernize the governance management of airspace operations above cities. Such a framework requires the involvement of non-aviation stakeholders due to the nature of the airspace; namely, very-low airspace above cities. In Europe, for example, Cities and Regions of the UAM Initiative Cities Community (UIC2)[3] have presented in December 2020 a Manifesto on the multi-level governance of the urban sky. The World Economic Forum has also recently launched its Advanced and Urban Air Mobility Cities and Regions coalition with the view to building on the work of UIC2 at a global level and assisting local policy makers to implement these new aerial technologies into their transportation networks in a responsible manner[4]. UAM is not just about aviation. It is about a new transportation mode in cities and thus non-aviation policies and stakeholders apply. Urban and mobility planning activities do not typically take into account UAM services, which can hinder the sustainable and responsible integration and adoption of UAM services in cities.

2.3 The choice of use cases (e.g. medical deliveries) for UAM is closely linked to the societal acceptance of UAM operations and services as shown in Europe, in the findings of the UAM Societal Acceptance study carried out by EASA in 2021. The study also highlighted the importance of integrating UAM services to ground mobility systems and fostering coordination among regulatory and other authorities. Urban mobility actors are mobilising in exploring the potential integration of UAM services in the context of urban and regional planning and development. In Europe, for example, Eltis, the EU's Mobility Observatory[5], published the first in its kind practitioner briefing on sustainable urban mobility and UAM.

2.4 Society needs not merely to accept but to embrace the concept of UAM for it to become a broadly deployed, socially tolerated (where trade-offs apply) and desirable, affordable and commercially viable mode of transport. Policy initiatives need to be put in place to manage UAM deployment:

- The reduction of cost of producing and using the e-VTOLs, as services become more prevalent and accessible is expected to be the switching point for scaling up. However, the consequences from scaling up will potentially trigger social considerations and barriers outlined above. This phase of the life cycle will require particularly careful societal management.

- The process of triggering and scaling up the deployment of UAM services must be well managed and communicated. This means that all stakeholders –not only users but all of those affected (e.g. citizens/residents) – need to co-create a modus vivendi that will eventually take the form of a social contract for embracing UAM services. Otherwise, there is the potential for social unrest and refusal of embracing UAM services.

[3] UIC2, Manifesto on the Multilevel Governance of the Urban Sky (2020), UAM Initiative Cities Community of the EU's Smart Cities Marketplace

4 The role of local authorities has been recognised in Europe (EASA / European Commission) via Article 18(f) of EU 2021/664 and the accompanying Guidance Material and AMCs to be approved by EASA/EU in Q2-Q3 2022.

[5] Eltis, The EU's Urban Mobility Observatory, Sustainable Urban Mobility Planning and Urban Air Mobility, December 2021

2.5 Social acceptance implies/denotes also the active engagement of diverse social/societal stakeholders in co-creation activities of the UAM applications and their associated trade-offs. In fact, it is about diverse, new (non-aviation), stakeholder groups, such as, inter alia;

- Transport-Aviation Ministries of Member States
- Regional Mobility Authorities
- Local Authorities
- Operators of urban mobility
- Associations of urban mobility

2.6 And, varying societal challenges in the context of UN's Sustainable Development Goals, such as:

- The benefits from UAM services should serve the common public good including responsible production and consumption, inclusion and affordability
- Negative externalities of UAM are not clearly understood; e.g. noise impact over long periods, energy consumption and lifecycle assessment metrics and transparency frameworks need to be established)
- Coordination, and where applicable co-creation, are needed among different authorities for safety, security, operational effectiveness, sustainability and societal acceptance

3. CONCLUSION

3.1 The development of UAM is becoming a reality that positions commercial aviation in a new era in terms of urban and metropolitan areas. Several aspects will need to be considered in a global, integrated and holistic approach by ICAO.

- Modernisation of the legal/governance framework in the emerging domain of urban innovation by involving local authorities as the new important stakeholder. Existing forums such as UIC2 in Europe and the World Economic Forum's Cities and Regions Coalition can serve as a conduit for ICAO engaging with relevant local authorities.

- Positioning the aviation sector at the forefront of leading the coordination and convergence with ground mobility stakeholders in the context of enabling a citizen-centric approach to the responsible integration of UAM operations/services with sustainable urban mobility plans of cities and regions.

3.2 The successful development and implementation of UAM should be founded on a holistic policy on integrated and sustainable urban mobility that will require the development of an integrated UAM regulatory framework across transport sectors.

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