

Positioning Helicopters in the Urban Air Mobility Ecosystem

1. Introduction: The Urban Air Mobility Ecosystem

Mobility is a key societal need and a cornerstone of liveable and sustainable cities, and which ensures economic growth, social development and cohesion. Hence, the search for seamless and 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. Having an 'air' segment to current and future urban mobility systems will provide an additional degree of freedom in terms of efficiency and effectiveness. These air mobility solutions will also contribute, enhance and complement existing public air services by leveraging its point-to-point network, targeted mission time saving and planned vertiport network. As an example, in this context, vertiports will become a pivot point for future Emergency Medical Services allowing medicine, staff or patient transportation.

The term 'urban air mobility' is a recently used one (from 2015/16 onwards) to refer to the new potential that can be brought to urban mobility by air vehicles. However, the term 'urban air mobility' is not defined in law and is used to mean different things by different stakeholders.¹

- The use of the term 'urban' can be understood to include different types of airborne operations. No matter the type, the key characteristic is that the airborne segment will involve a flight above populated areas, such as intra-city,² peri-city,³ inter-city⁴ or urban-rural.⁵
- The use of the term 'air' often focuses on the aircraft component and its transition through the airspace. Both in the EU and outside, discussions often treat 'UAM' as being synonymous with passenger electric vertical take-off and landing aircraft (eVTOL) operating from vertiports with Air Traffic Management (ATM) and U-space services.⁶ However, UAM also includes

¹ For example, NASA defines 'Urban Air Mobility' as the "[s]afe and efficient system for air passenger and cargo transportation within an urban area, inclusive of small package delivery and other urban Unmanned Aerial Systems (UAS) services, which supports a mix of on-board/ground-piloted and increasingly autonomous operations". NASA, 'NASA Embraces Urban Air Mobility, Calls for Market Study', <https://www.nasa.gov/aero/nasa-embraces-urban-air-mobility/#:~:text=Our%20definition%20for%20UAM%20is,piloted%20and%20increasingly%20autonomous%20operations.>

² An operation within a single city, such as a short distance taxi service from one side of a city to the other or transport of blood samples between hospitals.

³ An operation between a city and a location outside of the city or *vice-versa*, such as a service between downtown and an airport.

⁴ An operation between more than one urban area, such as a service between two cities.

⁵ An operation between two points crossing the interface of urban and rural populated areas.

⁶ Commission Implementing Regulation (EU) 2021/664 of 22 April 2021 on a regulatory framework for the U-space; Commission Implementing Regulation (EU) 2021/665 of 22 April 2021 amending Implementing Regulation (EU) 2017/373 as regards requirements for providers of air traffic management/air navigation services and other air traffic management network functions in the U-space airspace designated in controlled airspace; and Commission Implementing Regulation (EU) 2021/666 of 22 April 2021 amending Regulation (EU) No 923/2012 as regards requirements for manned aviation operating in U-space airspace.

conventional helicopters, airplanes and drones, as well as interoperable interfaces with other transport stakeholders.

- Finally, the use of the term ‘mobility’ includes the intermodal movement of people and freight by air, and its inherent link to other mobility services, such as bikes, scooters, trams, trains, cars, often considered in their electric-powered version like e-scooters, e-bikes, electrical/hybrid cars and vehicles.

In order to ensure full societal benefit, optimise mobility solutions and create a competitive UAM market, the whole UAM ecosystem must be regulated in a safe, secure, inclusive and competitive way. To this end, ASD believes helicopters are a fundamental player in the UAM ecosystem and their presence should be ensured.

2. Aircraft Certification and other ‘Operational’ Regulations

There should be a high level of safety, as defined in the regulations, for both helicopters and eVTOL aircraft.

Different certification requirements are applicable in Europe:

- The certification requirements for helicopters (CS-27 and CS-29) ensure a high and acceptable level of safety which the manufacturers adhere to. Commercial Air Transport to cities (‘congested hostile’ environment) is regulated by the Air Operations Regulation (Performance Classes limitations consider one engine failure and the average 1E-5/hour reliability of turbine engines).
- The EASA VTOL⁷ Special Condition aims to ensure a higher level of safety for intense operations in a city, considering the increased risk to people on the ground, which is achievable thanks to the novel architecture and technical characteristics of eVTOLs (distributed e-propulsion in particular).

In conjunction with the certification specifications of conventional helicopters and eVTOL aircraft, new European aviation regulations have been published for operations of drones of the low and medium risk categories.⁸ In addition new airworthiness, maintenance, air operations, vertiports regulations and new rules of the air are being prepared for UAS of the higher risk category as eVTOLs both in the ‘manned’ (pilot on board) and ‘unmanned’ (no pilot on board) configurations. Last but not least, a new paradigm for the use of airspace through the introduction of the U-space airspace and associated services has been defined in the so-called ‘U-space Regulation’.⁹

⁷ Special Condition for Small-Category VTOL Aircraft, VTOL.2000 Applicability and Definitions: “(a) This Special Condition prescribes airworthiness standards for the issuance of the type certificate, and changes to this type certificate, for a person-carrying vertical take-off and landing (VTOL) heavier-than-air aircraft in the small category. This Special Condition is applicable to aircraft with lift/thrust units used to generate powered lift and control and with more than two lift/thrust units used to provide lift during vertical take-off or landing.”

⁸ Commission Delegated Regulation (EU) 2019/945 of 12 March 2019 on unmanned aircraft systems and on third-country operators of unmanned aircraft systems; and Commission Implementing Regulation (EU) 2019/947 of 24 May 2019 on the rules and procedures for the operation of unmanned aircraft.

⁹ Commission Implementing Regulation 2021/664.

These, plus the associated certification specifications, are intended to contribute to a new aviation ecosystem in which air vehicles of very different nature and characteristics will co-exist in the same airspace. In order to fully exploit the benefit from this wide variety of air vehicle and mobility services, it is necessary that all the different flying platforms – e.g., eVTOLs, helicopters, airplanes and drones – will be part of the same system, rather than creating segregated operational environments, which would create limitations, hurdles and would cause the system to become rigid and not attractive for the market.

The rules should not be developed in a way to automatically exclude helicopters. For example, EASA is currently developing ‘The Prototype Technical Specifications for the Vertiport Design’ Manual, which will be used to facilitate the building and use of vertiports in Europe. Here, ASD believes that the vertiport regulation, which will be developed from this Manual, should not *prima facie* exclude helicopters. Rather, helicopters should be able to use vertiports, so long as they are able to comply with the operational limitations in that area (e.g., noise and flight performance). The use of the vertiport can stem from simply being able to land and take-off, to using other facilities such as to refuel, undergo maintenance, and operator passenger and cargo services.

The operations of helicopters may be different from those proposed for VTOL aircraft. The latter is expected to participate in high-frequency transport of people and cargo in the urban environment. This may be different from helicopter operations which is usually on a lower frequency, but still have a role to play in UAM.

3. Conclusions

ASD therefore asks EASA to provide a clear position on how to strategically build the full UAM regulatory framework in an inclusive, safe, secure, sustainable and competitive way. In doing so, it should be ensured that, based on the high level of safety of the helicopter sector, helicopters can participate in the future UAM ecosystem, utilising *inter alia* U-space services and vertiports, thus ensuring that a level playing field is guaranteed.

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