

Innovation Hub
Key Considerations for
Airspace Integration within an
Urban Air Mobility Landscape
Future Air Mobility Sandbox

The Eve Sandbox Case Study

The UK Civil Aviation Authority's (CAA) Regulatory Sandbox helps industry innovators to increase their chances of complying with future regulations.

This is achieved by ensuring development activities identify the key challenges that innovation can bring in terms of safety, security and consumer protection. By working with innovators via the Regulatory Sandbox, the CAA aims to tackle challenges at an early stage, helping to accelerate the pathway to approving novel technologies and concepts.

Following the launch of our Future Air Mobility Regulatory Sandbox, a consortium led by Eve Urban Air Mobility Solutions came together to consider the UK case. The consortium, working together with the CAA Innovation Hub, are developing a concept of operations for Urban Air Mobility (UAM) operations, focusing on the transportation of passengers over London in novel vertical take-off and landing (VTOL) vehicles.

Within this publication **we share the key considerations for integrating UAM operations into UK airspace from the perspective of the Eve case study.**

The work being done within the Sandbox is still evolving, but by sharing work as it progresses we hope to support innovators wishing to influence and implement airspace design, procedures and infrastructures for safely integrating UAM operations into low-level airspace.

The CAA Innovation Hub welcomes feedback on these key considerations to help us to identify other areas to explore and continue our iterative learning process.



Who are the Consortium?

In addition to Eve, the consortium includes international companies that span the aviation industry, including:

- Heathrow Airport;
- London City Airport;
- NATS;
- Skyports;
- Atech;
- Volocopter; and,
- Vertical Aerospace

What are the aims of the Eve Sandbox Project?

Within the Sandbox the Eve-led consortium aims to:

- Develop a concept of operations for safely integrating passenger carrying piloted electric air taxis into low-level airspace, with specific focus on the transportation of passengers from London City to Heathrow airport with stops in between.
- Deliver a tested framework for harmonising airspace, procedures and infrastructure to accelerate the advancement of the Urban Air Mobility (UAM) ecosystem.
- Help the CAA to shape future regulations for UAM operations across the UK.

Eve Sandbox Case Study

Transporting passengers over London in novel electric and hybrid VTOL vehicles



Visit UK Urban Air Mobility Consortium for further information on the Eve project
ukairmobility.com



Visit the CAA Innovation Hub for latest updates, guidance and challenges
caa.co.uk/innovation

The Innovation Hub does not provide regulatory approvals or define CAA Policy. Approvals will be assessed independently by our regulatory teams and their decision about whether or not to grant an authorisation or approval will be subject to current regulatory requirements. Whilst the Innovation Hub endeavours to ensure the accuracy of its guidance and materials, the nature of innovation is one of forecasting, continuous development and change and you should seek independent advice on your specific circumstances.

The Regulatory Sandbox

Methodology of the Regulatory Sandbox

The Eve Sandbox project is being run in accordance with the principles of the CAA Regulatory Sandbox, which encourages open discussion between participants to identify and work towards addressing the key challenges that innovation can bring in the areas of safety, security and consumer protection.

This has involved the Eve consortium describing in detail the use case and its proposed solutions in innovation-focussed workshops with CAA specialists in Airspace Management, Aerodromes, and Flight Operations. Through this two-way dialogue they were able to discuss the applicability of current regulations to the scenarios described, potential key risks to these operations and to explore the delta between the intended operation and the safety requirements.

Sharing lessons from the Regulatory Sandbox

Lessons identified within the Regulatory Sandbox are shared with the industry so that other industry innovators may benefit from understanding the challenges which are key to the CAA and to support the future development of the UK-based aviation sector. It is within this publication that we aim to share the initial findings of the Eve Urban Air Mobility CAA Sandbox project.

Signposting relevant regulations and guidance

Current regulations and principles are signposted to provide a starting point from which to consider the regulatory context which may apply to future operations. Other regulations, guidance and materials will also be applicable to consider.



Documents

Document Sharing Hub

The Key Challenges

The key challenges for airspace integration

The Eve case study presents a specific use case; transportation of passengers from London City to Heathrow airport with stops in between.

By referring to the specific use case we were able to work towards identifying and understanding some of the challenges of integrating UAM operations into the airspace.

Many challenges were discussed, which broadly fell into the following three high-level areas:



Exploring the challenges UAM operations at scale may bring.



Low-level flying in congested built-up environments.



Understanding how the endurance capabilities of electric Vertical Take-off and Landing (eVTOL) aircraft may impact upon airspace integration.

Fuller appreciation of these challenge areas will play a significant role for the integration of UAM into UK airspace.

Additional factors, including integration of UAM operations on the ground and into ground infrastructure, are also important to consider but are not focused on within this document.



UAM operations at scale



The use case proposes scaled UAM operations, ultimately increasing the traffic density of the target airspace environment. This presents operational, safety and integration challenges to overcome.

Fundamental to this aspect of the use case is how the human performance of operators may be changed when managing a complex network of traffic flows, and how to maintain the fair and equitable access to airspace.