

Innovation Hub

Future Air Mobility Regulatory Challenge



We are inviting organisations to join our regulatory Sandbox to explore with us the requirements for the approval of Future Air Mobility operations

You are developing a novel solution for Future Air Mobility and are ready to test and prove the feasibility of your solution in a safe and controlled experimental environment. Following this, you want to conduct trials, and progress towards small scale commercial operations. You are unable, however, to get regulatory approval because your solution does not fit within the existing scope of regulations.

The Regulatory Sandbox provides a pathway to seek approval for the trial of your solutions and enables you to inform the regulatory frameworks that will enable commercial operations.

The call is open to individual organisations or consortia working on transportation of passengers, goods or services, from A-B, using new or novel aviation technology, operations, or business models. This could include use of a new aircraft design, novel use of an existing aircraft, supporting infrastructure and systems, or any other solution that will enable Future Air Mobility operations.

The Context

Future air mobility use cases, often under the concept of Urban Air Mobility (UAM), have developed rapidly in recent years. This has been driven by large-scale investments in new aircraft designs, research into future air mobility and integrated transport networks, as well as commercial partnerships between equipment and technology firms in aviation and other sectors. The range of use cases proposed is expanding; from [airport shuttles](#) and [on-demand intra-city services](#) to [regional](#), [inter-city](#) and [rural services](#).

Gaining regulatory approval for Future Air Mobility operations is new territory; aviation regulations and approval mechanisms must adapt. Some changes are required to ensure:

- The Future Air Mobility industry meets the highest safety standards,
- Aviation security risks are managed effectively,
- Consumers have choice, value for money, are protected and treated fairly when they fly,
- Through the efficient use of airspace, the environmental impact on local communities is effectively managed and CO2 emissions are reduced.

We have put together an initial list of *Regulatory Questions* to explore which changes in regulations and approval mechanisms may be required:

Aircraft

- What are the requirements for the design, maintenance and repair of aircraft? How do these requirements apply to novel propulsion systems used in electric, hybrid, and hydrogen aircraft?
- What are the failure modes, redundancies, and contingency procedures?

Ground Infrastructures (Airport, Vertiport, etc.)

- What should the infrastructure requirements be to enable safe ground operations? This includes considerations on bird strikes, dangerous goods, rescue and firefighting services, etc.
- How should aircraft be refuelled/recharged? What are the implications on the safety of both ground and air operations? What are the implications of operating in an urban environment?
- How can the safety and security of landing areas be assured?

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Airspace & Air Traffic Management (ATM)

- What are the requirements to enable safe integration with other airspace users?
- What are the requirements for ATM integration?
- Are current navigation and positioning methodologies sufficiently resilient and robust for use in urban environments?
- What are the operating procedures with regards to avoiding collisions (air and ground)? How should these procedures be adapted for urban environments?
- What are the emergency procedures?

Aviation Security

- What should be the requirements for screening passengers, ground staff, crew, and goods to ensure secure ground operations?
- What should be the requirements in terms of boarding procedures, screening of baggage, aircraft search requirements, aircraft cockpit security, security training, and recruitment?
- What are the cyber security requirements for ensuring all critical network and information systems maintain confidentiality, integrity and availability? (For further information see the Cyber Security section of the CAA website).

Licenses

- What should be the licensing requirements related to Aircraft, Operators, Ground Infrastructures, Airspace Traffic Managers and Controllers, etc.

Training

- What should be the requirements for training pilots, cabin crew, air traffic controllers, engineers, ground site staff, security personnel, etc.

People

- Who will be affected, either directly or indirectly, by this proposal?
- What have you done to plan the integration of human performance into the new system being proposed?

Consumer

- How will consumer protection (i.e. delays/cancellations, baggage problems, complaints, passengers requiring special assistance) be considered as part of Future Air Mobility operations?

Environment

- What is the overall environmental impact and how will this be managed?
- What are the noise implications and how will this be managed?
- What are the visual blight considerations and how will this be managed?

Societal impact

- How can the public perception of Future Air Mobility activities be tested?
- What information should be made available to the public on societal impacts of new innovations?

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- How can the public be included in the testing of Future Air Mobility concepts? How can the public be integrated into the process for developing and testing new future air mobility concepts? How can societal impacts be mitigated or minimised effectively?
- How should public perception be captured under the testing process?

Please note that this list of Regulatory Questions is by no means an exhaustive list.

Join our Regulatory Sandbox

We want to learn how your solution addresses our Regulatory Questions. We believe that the quickest way to learn is to run tests in a safe environment that poses no threat to public and airspace users.

By working with you on these tests, we can establish a common understanding of the requirements that will guide the approval to trial your solution. And, as we learn together, you will have an opportunity to influence the future regulatory frameworks that will enable commercial operations of Future Air Mobility solutions like yours.

When joining our Regulatory Sandbox, you will receive support from a dedicated case officer who will:

- **Act as a single point of contact**, convene CAA resources, and coordinate information flow
- **Identify the regulations applicable to the trial in real world**
- **Clarify the regulatory challenges**, i.e. aspects of the trial operations that do not fit within the existing scope of regulations
- **Mediate discussions with the CAA regulatory teams** to establish a common understanding of the regulatory questions that must be addressed to unlock the regulatory challenges and obtain regulatory approvals
- **Support the creation of iterative tests in a safe environment** to build the evidence base supporting regulatory approval for trials
- Provide continuous support throughout the tests and trials to **maintain focus on safety and consumer protection standards**

What we are looking for

The organisation or consortia should demonstrate to our satisfaction that they meet the following criteria:

- Propose an aspect (or aspect(s)) of a Future Air Mobility solution which addresses any of our 'Regulatory Questions' (see 'context' section).
- Understand the current regulatory requirements with regards to conducting tests and trials.
- Have reached a level of readiness sufficient for commencing testing.
- Can demonstrate sufficient corporate commitment to support the sandbox activities.

We expect applicants to demonstrate the above expectations through a proposed concept of operations (CONOPS) for the Future Air Mobility operations they want to undertake.

The CONOPS must include the following information:

1. Introduction

Provide an outline of the project along with its objectives and goals, as well as the nature of support you require from the Sandbox. A background of the company/entity/consortium should be

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presented, along with confirmation that resources (such as funding) are in place, in order to see the project to completion.

2. Overview of proposed trials

Describe in detail your intended trials/operations. This should include as a minimum any locations, operating procedures, duration, dates/times, and involved personnel. Provide as much information as possible (and relevant). This will shape the scope of how the sandbox can support you.

3. Proposed Solution

Provide details as to how you intend to achieve your proposed trials. Explain the capabilities and/or solutions you will be making use of, whether technological, operational, or otherwise. If technical, provide details of it, diagrams, explanation of parts, and how everything works. Demonstrate that your technical solution has reached a readiness level (TRL) that is sufficient to begin testing.

4. Operating Environment

Explain in detail where the trial is expected to take place, and how the necessary and required capabilities will be tested and demonstrated before commencement of trials. If a safe environment and/or testbed will be established, please provide details.

This needs to show considerations for both Airspace and Ground risk if applicable.

5. Timelines

Present a detailed project plan, timeline and major milestones. This will serve as a starting point and might need to be refined as the sandbox project progresses.

Provide an overview of any progress made to date and what, if any, previous trials/tests have taken place.

6. Annex

Provide any relevant data and/or supporting information

Costs

As a cost recovery body, not funded by the tax payer, the cost of our activities must be paid by those we regulate.

Support from the Innovation Hub and the dedicated case officer will incur no cost.

However, access to CAA regulatory subject matter experts, for instance to clarify the regulatory challenges and regulatory questions, may incur charges; we will clarify these charges with you upfront, before we start the Sandbox project.

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All regulatory applications that may be required during the Sandbox project, for instance to set up a controlled experimental environment, will be charged in accordance with CAA statutory charges.

How to Apply

In order to apply, you will need to:

1. Complete our [online submission form](#).
2. Attach to the submission form your proposed concept of operations (CONOPS).
3. Successful applicants will be required to conclude a [memorandum of understanding](#) (MoU) and [non-disclosure agreement](#) (NDA) with the CAA. Please review the provisions of these documents as there will be no scope to negotiate them.

If you have any questions about the application process, please contact us through our email address: innovation@caa.co.uk.

Timelines

There is no cut-off date for applications for the open call but the Innovation Team will start to assess relevant applications from 12:00pm on **31 July 2020**. If you wish to apply for the first available sandbox slots, you should submit your application by this date. We will aim to announce the successful organisations with a view to kick-off the first project soon after.

Following this, the challenge will remain open for further applications. These will be assessed as and when they are received, and we will plan future onboarding of organisations demonstrating their application meets our selection criteria. This will be subject to Innovation Hub resource availability.

If we have any questions about your application, we will get in contact with you via email or phone. We may not be able to provide feedback on unsuccessful applications.