

Innovation Hub
**Advanced Air Mobility:
Taking a Use Case Approach**
To Develop Regulation

Overview

This document provides an update on the CAA's evolving work to explore Advanced Air Mobility (AAM). It sets out and justifies an approach to regulatory development founded on AAM use cases.

The concept of Advanced Air Mobility is centred around the use of revolutionary new aircraft, but [page 2](#) describes how AAM covers a range of themes from novel propulsion, through to new business models that enable new experiences for consumers.

By virtue of the word 'mobility', it is difficult to fully embrace the concept of AAM without considering its development in partnership with the increasingly integrated transport network, as explored on [page 3](#).

In shifting focus towards an aviation ecosystem that interacts with other transport modes as well as local communities on a more personal level, [page 4](#) explains that we must consider the evolution of roles necessary to deliver it.

Due to its multi-layered nature, [page 5](#) explores how AAM will require significant collaboration between a much broader range of stakeholders to ensure that all aspects of the ecosystem are aligned.

Given the extensive nature of Advanced Air Mobility, we must take an innovative approach to developing regulation. Taking a use case approach, as outlined on [page 6](#), enables us to identify specific regulatory challenges, while not trying to solve the whole of AAM in one go.

On [page 7](#) we take a look at some example AAM use cases. We can start to look at assumptions and common factors across these that offer an insight into what future AAM services may look like.

Regulatory Frameworks for AAM need to be flexible enough to enable future innovation, whilst maintaining or enhancing existing safety levels and mitigation of risks. [Page 8](#) describes our regulatory approach to AAM.

The breadth of impact of AAM results in a wide risk landscape, as detailed on [page 9](#). Using the use case approach allows us to explore risk areas specific to the use case, and in turn building a rich risk landscape for AAM.

In addition to existing aviation parallels, some AAM use cases are likely to also give rise to new ways of exploring safety risks. [Page 10](#) identifies that, in addition to existing aviation parallels, some AAM use cases are likely to also give rise to new ways of exploring safety risks.

Advanced Air Mobility use cases also enable us to explore the broader ecosystem and key non-safety risks, under important areas like consumer issues, which we detail on [page 11](#).

Advanced Air Mobility use cases are unlikely to succeed if they do not account for ever-changing social and political influences. Key risks may stem from society's tolerance of noise or its environmental consciousness, as explained on [page 12](#).



What is Advanced Air Mobility?

The concept of Advanced Air Mobility is centred around the use of revolutionary new aircraft, but covers a range of themes from novel propulsion, through to new business models that enable new experiences for consumers.

Given the breadth of the topic, multiple definitions and explanations are beginning to be recognised in association with AAM concepts. There may also be differences between the terms used to classify or categorise regulatory distinctions, for example between aircraft types. Terms that the industry may use to communicate their new products and services may also differ for the purposes of communications or marketing.

It is important that [terms are harmonised](#) to establish recognised definitions on a global scale. This will help the continued development of use cases and will ensure regulation is clear.

Following our previous publications on 'Future Air Mobility' we have updated our terminology to '[Advanced Air Mobility](#)'. This term has already been adopted by many stakeholders including a significant portion of UK industry and is consistent with the use cases we are exploring. A clear definition of Advanced Air Mobility was coined by NASA, and can be found in the table, alongside other related and increasingly recognisable terms.



What AAM means to us...



New and novel ways of transporting people, goods and services by air commercially.



Aircraft or aviation systems with significant modifications to their design and operation.



Business models and operational solutions that result in new experiences with air-travel and transportation.



Novelty as a result of advanced technology-driven systems.

Term	Definition
Advanced Air Mobility (AAM)	"Air transportation services for people and/or cargo between places [...] Local, regional, intraregional, urban – using revolutionary new aircraft." (source: NASA)
Vertical Take-Off & Landing (VTOL)	A VTOL vehicle, or aircraft, can hover, take off and land vertically. This includes traditional rotorcraft, powered lift and other lifting systems such as jet configurations
eVTOL	A major subset of VTOL often used interchangeably – the "e" referring to electric engine used for propulsion, or in part (i.e. 'hybrid')
Urban Air Mobility (UAM)	Air transportation service(s) for people and/or goods ('cargo') in a city or other urban environment(s)
Rural Air Mobility	Air transportation service(s) for people and/or goods ('cargo') in the countryside or other rural environment(s)
Vertiport	Landing and take-off ground or elevated platform developed for VTOL and eVTOL aircraft
Use case	A proposed operation or single set of operations outlining its goals and operating environment . An illustrative example of an AAM concept

Advanced Air Mobility in an Integrated Transport World

By utilising the term ‘mobility’, it is clear that the concept of AAM inherently relates to the concept on an increasingly integrated, multimodal transport network.

Whilst aviation currently forms a critical component of international and national connectivity, it has until now been somewhat separated by its nature, and has often been considered under its own isolated structures and processes.

This unique status has been helpful in enabling the current aviation sector to develop: bringing with it high standards of safety, harmonised international regulatory approaches, and a global mindset when it comes to aviation operations.

However, as we look more closely at AAM use cases and explore macroeconomic trends like Urbanisation and ‘Mobility as a Service’ (MaaS), it also feels right to ask whether closer coordination with other transportation methods may be needed.

Whilst Government is largely responsible for overall transport strategy, AAM use cases offer an opportunity to consider the role of aviation as part of the more local mobility proposition within a specific jurisdiction. From a Social Licence (as defined in CAP 1900) perspective this approach is advantageous as it supports a strong focus on what the outcome of a mobility service should be for the consumer and locally affected stakeholders.

The motivation to maximise the benefits of integrated and ‘smarter’ transport systems, particularly where demand is high due to large populations or expansive urban landscapes, can also provide insightful AAM use cases that can be explored and analysed. This has inspired the creation of global initiatives intended to encourage collaboration.

World Economic Forum: UAM Cities Initiative

This is a useful example of an initiative that is exploring stakeholder integration.

It aims to encourage cities and other local or community based stakeholders to engage with industry and policy-makers to develop positions and support for Urban Air Mobility use cases that support their needs, as well as their responsibilities to the public.

Its first piece of work was led by the City of Los Angeles. It proposes ‘Principles of the Urban Sky’ as a first step for local authorities and transportation leaders having a say on the developments in UAM and how they can help to meet public transport needs.

These principles and more information about the work of the WEF initiative can be found at <https://www.weforum.org/reports/principles-of-the-urban-sky>



The Evolving Roles in Advanced Air Mobility

In shifting focus towards an aviation ecosystem that interacts with other transport modes as well as local communities on a more personal level, we must consider the evolution of roles necessary to deliver it.

Trends under AAM may see a gradual evolution in the roles that currently exist. The outputs of emerging technologies have already given rise to more coordinated activity, for example between energy, technology and transportation policies.

Similarly, the development of remotely piloted aircraft has already driven new thinking on roles and responsibilities – for example introducing distinct roles of the ‘remote pilot’ and ‘drone operator’. New or modified responsibilities have also given rise to questions on how to integrate a greater range of airspace users into the aviation ecosystem.

In terms of regulation, maintaining distinct roles and responsibilities between the regulator and the industry is a key enabler of our [performance-based approach](#): allowing clear oversight and accountabilities to be understood under industry-led safety and security management systems.

As innovators develop their own AAM business models they may consider different roles. These may even evolve throughout the development of their services and operations, as they transition from focussing on design and manufacture towards commercial operation. For example, some AAM organisations are positioning themselves to manage training, operations and maintenance in-house.

One example of where conversations on changing roles and responsibilities have been evident is the role of local authorities when it comes to drone use in public parks. These conversations have been important and should continue. However, there is a danger that people look to simply shift responsibility from one party to another; rather than recognising the increased [need for enhanced collaboration](#) and to embrace evolving or new responsibilities as well.

The existing aviation sector is made up of a plethora of stakeholders, all playing important and distinct roles. These include:

- Original Equipment Manufacturer (OEM).
- Maintenance organisations.
- Aircraft operators.
- Service operators e.g. airlines.
- Consumers/ passengers.
- State operators (e.g. HEMS¹, powerline / pipeline operators).
- Drone Operators and remote pilots.
- Flight Crew, including pilots and cabin crew.
- Air Traffic Managers.
- Aerodrome Managers.
- General Aviation community.

As AAM use cases develop, we can consider the impacts of collaboration across public and private sector stakeholders in greater detail; alongside possible [effects on skills and training](#), or on identifying and managing liabilities. Initiatives, such as the UK Government’s Future Flight Challenge, and US-based Community Air Mobility Initiative (CAMI) are just two which look to build cooperation efforts on the basis of collaboration.

¹ HEMS – Helicopter Emergency Medical Services