UK Civil Aviation Authority

Airspace Architecture for Future Operations: Explainer

Concept of Operations for Enabling BVLOS

A drone spots a cracked rail before it causes a derailment. Another carries donor blood between hospitals. Emergency responders receive real-time aerial information during a major incident. Meanwhile, crewed aircraft continue to operate safely overhead.

Versions of this future already exist. The challenge is making it routine.

That is what the UK Civil Aviation Authority's Airspace Architecture Concept of Operations (ConOps) is for.

Why this matters

At the moment, keeping drones and crewed aircraft apart means keeping them in separate airspace through things such as temporary danger areas and bespoke deals with air navigation service providers. It works and is it how BVLOS trials have safely got this far. But it does not scale.

Every new drone operation that needs its own airspace makes life harder for the next one, and for the crewed aircraft that lose access to that airspace while it is reserved. Multiply today's handful of trial operations into the hundreds or thousands the industry is planning for, and the current model just is not fit for purpose.

This is not just about enabling more drone flights for the sake of it though. It is about building an airspace system that can support new services and business models that do not exist yet at scale because the airspace cannot support them.

So, how do drones and crewed aircraft share the same airspace, routinely, at scale? The answer is not a single piece of technology or a single new rule. It is a combination of digital services, technical standards and risk-based tools working together. The ConOps is where the CAA explores how that future could work in practice.

What this is

The ConOps builds on the Airspace Modernisation Strategy and the BVLOS Roadmap (CAP 3182), which together describe the long-term vision and pathway towards routine BVLOS operations.

The BVLOS Roadmap lays out the stages of integration, from today's trial-based, segregated model through to routine BVLOS operations at scale. The ConOps is the detailed picture of what each of those stages requires.

It sits inside the Future Air Traffic Management and Air Navigation Services (Future ATM/ANS) programme, which delivers the Airspace Modernisation Strategy. Put the three together and you get the full chain: the Strategy sets the ambition, the BVLOS Roadmap sets the stages, and the ConOps sets out the operating model that gets you from one stage to the next.

It matters to anyone operating in UK airspace, anyone building the technology behind it, or anyone who wants to know where this is heading.

A vision, not policy

To be clear, the ConOps is a vision, not a policy. It is a direction of travel, not a set of rules.

It does not create regulatory requirements. It does not create operational privileges. It does not replace any existing rule or approval process. Every operation, today and for the foreseeable future, still must meet current requirements and get the right permissions.

The operating model it describes is not tied to a specific airspace structure. It sits alongside the airspace and approvals that already exist. Guidance on how to apply these concepts within today's airspace will follow separately.

What this version covers and what's next

This reflects the CAA's thinking as of July 2026, built on the evidence and industry engagement gathered so far.

In this version:

- the operating model for integrated BVLOS operations
- the technical architecture across six workstreams: Electronic Conspicuity, Detect and Avoid, Command and Control, UAS Traffic Management, System Wide Information Management and Ground Infrastructure
- operational scenarios used to develop and test policy
- the technical requirements each workstream is expected to place on operators and manufacturers

Examples of things not yet in scope, but coming:

- Remote Identification (RID)
- Common Information Service Provider (CISP) functions
- Detailed treatment of UA-to-UA risk

These will be important for a fully integrated airspace and will be considered for future versions of the ConOps as policy and operational thinking develops.

The CAA intends for the ConOps to be a living document. Future iterations are expected to be published annually unless there is a compelling reason to update sooner. Each version will reflect testing outcomes, operational experience, regulatory development and stakeholder feedback.

What makes integrated airspace possible

Six problems have to be solved for any of this to work.

Aircraft need to be able to see and understand surrounding traffic

Electronic Conspicuity (EC) develops the standards for how UAS broadcast their position and receive information about other traffic. **Detect and Avoid (DAA)** defines the capability requirements for acting on that information: detecting other aircraft and taking avoiding action. Together, EC and DAA provide the situational awareness and collision avoidance capability that integrated operations require.

Remote pilots need to stay connected to their aircraft

Command and Control (C2) establishes the performance requirements for the communications link between a drone and its remote pilot. In a BVLOS operation, that link must remain reliable throughout the flight, and aircraft must be able to respond safely if it is lost. This workstream defines what reliable means in practice, what standards C2 solutions must meet, and what contingencies are needed when the link cannot be maintained.

Information needs to flow between all participants

System Wide Information Management (SWIM) defines the standards governing how data flows between operators, traffic management services and air traffic management systems. Without consistent, reliable information exchange, the other capabilities cannot function as an integrated system.

Operations need to be coordinated at scale

Unmanned Aircraft System Traffic Management (UTM) develops the digital services framework that will manage drone operations across UK airspace: flight authorisation, conflict resolution and airspace awareness for multiple operators flying simultaneously. UTM makes it possible for many operators to share airspace without each requiring individual air traffic control clearance.

Infrastructure needs to support all of this

Ground Infrastructure (GI) complements airborne surveillance by providing additional surveillance and communication capabilities from the ground, including technologies such

as ADS-B receivers, multilateration and broadcast services like TIS-B. Together these enhance situational awareness and safety across integrated airspace.

Each area of work has its own detailed ConOps or policy documentation. The Future ATM/ANS ConOps sits above those documents, providing the integrated view: how these capabilities combine, how they are sequenced, and how together they support the introduction of integrated BVLOS operations.

What this means for you

UAS operators

If you currently fly BVLOS, you will know the challenges involved in this space. Temporary danger areas, reserved volumes, bespoke arrangements with air navigation service providers. Each takes time, limits flexibility, and cannot be replicated at the scale the industry needs.

The alternative the CAA is building is risk-based rather than airspace-based, through digital services and technical mitigations rather than relying on airspace structures. In practice, that means approval pathways that are faster, more proportionate and designed to scale. A BVLOS operation in lower-risk airspace will require a lighter set of mitigations than one in complex higher-risk airspace.

The scenarios in the Airspace Architecture ConOps show the kind of operational conditions and combinations of mitigations the CAA is working toward. None of it is finalised policy yet, but reading it now is the best way to understand the concepts and approaches currently being explored, and what your operations might need to look like when it develops.

Manufacturers and technology developers

The ConOps sets out what this architecture will demand of your products. Take conspicuity equipment. It cannot just broadcast a drone's position, it must receive information about everyone else's traffic too, in both directions. Collision avoidance systems will need to meet performance standards tied to the risk level of the airspace they're flying in. Communications links will need to hit defined reliability thresholds and be built to fail safely rather than fail silently. Interoperability with traffic management and information-sharing services is a baseline requirement, not an optional extra.

Build without reference to this architecture, and you risk building to the wrong standard. The Future ATM/ANS programme's integrated testing activity is where these requirements get pressure-tested, and what comes out of that testing feeds straight into the standards your products will be judged against. Get involved early, and you help write those standards. Wait, and you build to ones that might shift under you.

Airports, ANSPs, UTM Service Providers and other airspace users

For air navigation service providers, the traffic management and information-sharing workstreams have direct interface implications. The ConOps sets out how digital traffic management services are expected to interact with existing air traffic management systems.

The shift away from segregation is designed to reduce the impact that growing drone operations would otherwise have on crewed aviation. A framework built on shared airspace and digital coordination is a better outcome for all airspace users than one that progressively restricts more of the sky. For general aviation in particular, a future of ever-increasing danger areas and pop-up restrictions is not a good outcome, but the integrated model is.

How we got here

The Future ATM/ANS programme is the result of sustained work to understand what UK airspace needs to look like to support the operations the industry is already flying today.

The Airspace Modernisation Strategy (AMS) established the vision. The AMS set out the long-term ambition of a modernised airspace system that works for all users, traditional and emerging. It created the policy mandate for the work that followed.

Future of Flight is turning that vision into reality. The programme brings together policy development, operational concepts and the technologies needed to make integrated flight possible across a range of emerging use cases, including drones, advanced air mobility and autonomous systems.

The BVLOS Roadmap (CAP 3182) describes the stages of integration. It translates the Future of Flight ambition into a step-by-step path toward routine BVLOS operations, describing the progression from today's trial-based, segregated model toward a future where integrated operations are the norm.

The Future ATM/ANS programme develops what each stage requires. This is where the operating model, services and policies are being designed, tested and progressively refined.

The Airspace Architecture ConOps brings it all together. It describes the operating model, the technical architecture and the scenarios used to develop and test policy, with the aim of enabling routine BVLOS operations through a proportionate approvals process. It will continue to evolve, and it is the baseline from which the CAA is inviting industry to engage as detailed policy development continues.

While BVLOS operations are the immediate focus, the operating model and architecture being developed are intended to support a wider range of future airspace users and technologies as they emerge.

How to use the ConOps

The full document is substantial. Not everyone needs all of it.

New to the programme? Start with the Executive Summary and 'At a Glance' section, then Chapter 1 for scope and objectives.

Interested in the architecture? Chapter 2 sets out the airspace operational concept and technical design.

Operators, manufacturers or technology developers? Chapter 3 has the operational scenarios. Read the ones relevant to your operations or products. The requirements sections at the end of Chapter 3 set out the key technical requirements for each area of work.

Going deeper on a specific area? Each workstream has its own dedicated ConOps or policy documentation. Links are available on the CAA website.

Work with us

The CAA can not build this on its own. This operating model only works if the people who'll operate within it help shape it.

The programme is actively looking for input from UAS operators, manufacturers, technology developers, airports, ANSPs and other airspace users. Real-world operational knowledge, technical capability and commercial reality are what turn this from a vision into policy that works when it is tested against the real sky.

Engage now, and you're shaping future policy development, testing activity and implementation planning while it is still being written — not responding to it after the fact.

If you have questions about the ConOps, want to understand what it means for your specific operations, or want to get involved in the testing programme, contact us at airspacemodernisationdelivery@caa.co.uk

What happens next

- **Short term:** individual workstream policies and technical documentation keep developing, alongside early testing.
- **Medium term:** an integrated testing programme, combining workstream technologies in progressively more complex, realistic scenarios.
- **Long term:** final policies published, enabling routine BVLOS operations within integrated UK airspace.

Picture UK airspace a few years from now. Drones and crewed aircraft sharing it as a matter of course, not as an exception negotiated case by case. That is what this ConOps is building towards, one tested stage at a time, and it starts with industry helping shape the details now.