Airspace Modernisation - 2024 Progress Report

CAP 3084

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Executive Summary

In 2024, the UK Civil Aviation Authority (UK CAA), the Department for Transport (DfT) and the UK aviation industry continued to deliver programmes set out within the elements of the Airspace Modernisation Strategy (AMS). There were a number of key milestones delivered by the Co-sponsors (DfT and the UK CAA) in 2024.

In July 2024 the UK CAA published the Airspace Modernisation Part 3, the AMS Deployment Plan. This document sets out the programme delivery plan supporting over 100 projects to deliver the nine elements within the Airspace Modernisation Strategy. This enables all stakeholders to better understand the route to achieving a holistic modernisation of airspace; from underpinning operational policies and clearly sequencing milestones, to outlining dependencies between the various delivery elements.

The Co-sponsors have consulted on the formation of a UK Airspace Design Service (UKADS) that will create by the end of 2025. This will create a single guiding mind that will be responsible for future airspace design, with initial focus on London Terminal Airspace Design (Element 2). To support this the UK CAA have committed to consulting on CAP1616 and the airspace change masterplan in 2025 to streamline the airspace regulatory process.

This report consists of six chapters. Chapter 1 sets out the Airspace Modernisation delivery risk status as well as strategic risks and mitigations. Chapters 2 and 3 provide updates from the UK CAA and from the wider industry respectively on progress with delivery of the Airspace Modernisation Strategy delivery elements, categorised into two key areas: Aircraft-Based Navigation and Airspace Management. Chapter 4 provides an overview of the Local Single Sky Implementation Plan progress. Chapter 5 provides an update from the airspace modernisation Co-sponsors, the UK CAA and DfT, regarding the Airspace Modernisation Strategy governance. Chapter 6 provides an update on the airspace modernisation areas of interest in the Future of Flight Programme.

The Airspace Modernisation Strategy consists of nine delivery elements. This report summarises the 2024 status of these elements, providing a brief overview of progress made and mitigating actions taken where delays have taken place.

All nine elements have made progress and delivery complexities and risks have been managed in 2024. Six of the nine elements are shown as amber, meaning that progress is being made but some risks remain. Three elements are shown as red, meaning that whilst progress has been made there are risks that need further work to mitigated against them.

Element 1, Trajectory based operations saw progress in Free Route Airspace Deployment 3 delivery by NATS (En Route) plc and commencement of Performance Based Navigation consultation, led by UK CAA. Whilst not all baseline milestones have been met in 2024. NATS (En Route) plc's Free Route Airspace further deployments and future milestones

are experiencing delay, driven by the dependency on the delayed Deployment Point En Route programme. The impact of this delay and mitigating actions is being assessed to reflective of this uncertainty. The element's status is currently red.

Element 2, Terminal Airspace Redesign has continued risk around funding and delivery complexity, managed by the Airspace Change Organising Group (ACOG) and the Airspace Modernisation Strategy Co-Sponsors. Due to further delay experienced in this area, the risk of programme compression remains high. The Co-sponsors have worked closely with the airspace change sponsors and ACOG to mitigate these risks. The element's status is currently red, unchanged from 2023. Mitigating actions in 2024 include an alternative funding and delivery model and the formation of the UK Airspace Design Service which will help to mitigate these risks.

Element 3, Queue Management and Advanced Flexible Use of Airspace projects have maintained their amber status, mostly driven by the withdrawal of Arrival Manager HeadBranch deployments at Heathrow and Gatwick airports, due to technological issues. Progress was made with Time-Based Separations Pairwise delivered at Heathrow Airport in December 2024.

Element 4, focused on the policy development required to enable integration, has maintained its amber status from last year, reflecting the complexity of the work still to be completed. Delivery teams are now established and work this year has focused on developing policy concepts or concepts of operations, as appropriate. The Detect and Avoid policy concept has been published and consulted on with a review of the consultation feedback near completion. The Unmanned Traffic Management and Electronic Conspicuity concept of operations are both complete. Technical requirements for Ground Infrastructure are complete and informing the drafting of the concept of operations.

Elements 5, 7, 8 and 9, policy development programmes are led by the UK CAA and their status is currently amber. While progress has been made in establishing the delivery teams and processes within the UK CAA organisational structures, detailed delivery plans building on the expected baseline, and outlining how the short-term (two-year horizon) milestones will be achieved, are yet to be produced.

Element 6, Data services, a key enabler for several other elements, experienced delay in 2024. A resource risk identified in 2023 materialised, resulting in a delay to the delivery of strategically planned 2024 System Wide Information Management milestones. The issue was resolved in Q3 2024; however, this has affected subsequent milestones. There is also an ongoing delay to the data exchange required for implementation, meaning that the 31 December 2025 target date set out in Assimilated Regulation (EU) 716/2014 (the Pilot Common Project) will not be achieved. NATS (En Route) plc's technological change programme Deployment Point (DP) En Route experienced delays in 2024, with NATS (En Route) plc working through a recovery action plan. DP En Route is a key enabler for some areas of modernisation and is included in this report because of that dependency. The UK CAA has written to NATS (En Route) plc seeking to understand in greater detail the

causes for the delay and what mitigating actions it proposes. The element's status is currently red.

Introduction

In 2017, the Government updated the UK Civil Aviation Authority's strategic role for airspace modernisation by issuing new Air Navigation Directions. Consistent with our role as the specialist aviation regulator and our statutory responsibilities, the UK CAA is required to prepare and maintain a coordinated strategy and plan for the use of UK airspace for air navigation, including for the modernisation of the use of such airspace.

The Airspace Modernisation Strategy (CAP 1711 Part 1: Strategic Objectives and Enablers[1]) has been refreshed since its original publication in 2018, to extend the strategy's focus from 2024 out to 2040, as required by the Air Navigation Directions[2]. It takes account of the latest developments in innovation and technology, placing integration of all airspace users at the core of the strategy, including accommodating new types of aerial craft like remotely piloted aircraft systems[3], advanced air mobility[4] and spacecraft. The revised strategy aims for simpler airspace design and supporting regulations. Environmental sustainability is an overarching principle throughout modernisation activities. The strategy has been updated to meet the UK's international obligations, aligning delivery of the Airspace Modernisation Strategy with the International Civil Aviation Organization[5] Global Air Navigation Plan, and ensuring interoperability of the UK network with neighbouring air traffic management areas. The Airspace Modernisation Strategy is the single roadmap to guide the UK CAA's approach to policy development on airspace modernisation and related legislation (otherwise known as rulemaking) now that the UK has left the European Union (EU) and the European Union Aviation Safety Agency (EASA).

The strategy is split into three parts, published separately. Part 1 (Strategic Objectives and Enablers) explains the strategy's objectives ('the ends'), a high-level overview of what will enable those objectives to be fulfilled (the enablers or 'ways'), and governance arrangements for overseeing delivery. Part 1 does not specify detailed solutions, allowing the space for innovation.

Part 2 (CAP 1711a Delivery elements[6]) and Part 3 (CAP 1711b Deployment plan[7]) describe the short-term ambition and explain how the strategy is being delivered. Part 2 and 3 are likely to be updated more frequently than Part 1 as the elements evolve and

[1] CAP1711 Part 1: Strategic Objectives and Enablers
[2] Legislative Framework to Airspace Change: The Civil Aviation Authority (Air Navigation) Directions
[3] The Civil Aviation Authority's Guidance for Remotely Piloted Aircraft Systems (Drones)
[4] Refences in the Airspace Modernisation Strategy to the advanced air mobility concept generally mean eVTOL (electric vertical take-off and landing) aircraft i.e., aerial taxis, but this terminology may change.
[5] The International Civil Aviation Organization, a specialist agency of the United Nations responsible for international standards for civil aviation which the UK has agreed to implement by international treaty. Its strategic objectives (with respect to global aviation, not just airspace) can be read here: https://www.icao.int/about-icao/Council/Pages/Strategic-Objectives.aspx.
[6] CAP1711a: Airspace Modernisation Strategy 2023–2040 Part 2: Delivery elements
[7] CAP1711b: Airspace Modernisation Strategy 2023–2040 Part 3: Deployment plan

mature for delivery. Part 2 explains the different elements that make up delivery (the ways, in more detail). It includes a linked online database. Part 3 sets out delivery plans for deployment of those elements (the means).

The UK CAA must report to the Secretary of State annually on the delivery of the strategy. The update provided within the following chapters of this report comprises detail on the progress made by the industry, as well as on the policy development work conducted by the UK CAA, covering the period 1 January to 31 December 2024.

In line with the UK Reg (EC) No. 2150/2005 the UK CAA is also required to report annually to the Secretary of State on the application of the Flexible Use of Airspace Concept. This report analyses the Flexible Use of Airspace performance and describes the concept developments under Element 5.

Enhanced RAG Assessment Framework and Performance Ratings

For the 2024 Airspace Modernisation annual progress report, the UK CAA has applied more stringent assessment thresholds. shifting the focus from strategic and tactical-level oversight to operational planning and delivery, to enable greater scrutiny of industry and UK CAA progress and to aid with timely interventions from the DfT and the UK CAA as airspace modernisation co-sponsors.

Each element reflects the progress made throughout the year, with a status rating of red, amber or green (RAG), based on the current published baseline outlined in the latest edition of CAP 1711b Airspace Modernisation Strategy Part 3 for the UK CAA policy led areas. For NATS (En Route) plc, their Service and Investment Plan[8] from the beginning of the reference period, currently NR23 (SIP23), is used as a baseline, adjusted through updates to accommodate the dynamic nature of NATS (En Route) plc's portfolio of programmes. For ACOG it is the latest accepted iteration of the Masterplan[9]. The overall 'RAG' rating is determined by a combination of timeliness and outcome assessments.

- GREEN from a timeliness perspective indicates a 0–1-month delay from baseline; from an outcome perspective it indicates that there is strong certainty about outcomes. Assumptions are well-validated, risks are minimal or well-mitigated, and data or experience strongly support the plan. Most unknowns are accounted for.
- AMBER from a timeliness perspective indicates a 2–3-month delay from baseline; from an outcome perspective it indicates there is moderate certainty about outcomes. Some assumptions may still need validation, and risks are present but manageable. The element relies on a balance of knowns and unknowns, requiring monitoring and potential adjustments.

[8] NATS (En Route) plc publishes its Service and Investment Plan (SIP) through its NATS customer gateway website (a login is required).
[9] UK Airspace Change Masterplan Iteration 2

- RED from a timeliness perspective indicates a 4+ month delay from baseline; from an outcome perspective it indicates there is low certainty about outcomes. Assumptions are largely untested, and there are significant risks or unknowns that could impact the element. The plans may need considerable adaptation as the project progresses.

The outcome assessment for each element is informed by several key factors, including quality, cost, dependencies, planning, resources, risk and stakeholder commitment. While the assessment is based on the analysis of these data points, it is also influenced by the UK CAA Airspace Modernisation Oversight team's confidence in the likelihood of project outcomes being delivered within the expected timeframes, based on the available data. The UK CAA Airspace Modernisation Oversight team is independent from the UK CAA teams delivering the policy development projects and is engaging in regular oversight of the industry progress, in line with the Airspace Modernisation Strategy Governance arrangements.

Structure and Content Overview

Chapter 1 sets out the Airspace Modernisation delivery risk status as well as strategic risks and mitigations. In Q3 and Q4 2024, strategic risks to the Airspace Modernisation Strategy were defined, and the chapter provides a summary of these. Additionally, the chapter outlines the risk management framework used to address any risks that arise during implementation.

Chapter 2 provides a **UK CAA** update on the delivery progress of the Airspace Modernisation Strategy elements, categorised into two key areas: Aircraft-Based Navigation and Airspace Management. This is in the form of a 'RAG' status and compared against the progress reported in 2023.

Chapter 3 provides an **industry** update on the delivery progress of the Airspace Modernisation Strategy elements, categorised into two key areas: Aircraft-Based Navigation and Airspace Management. This is in the form of a 'RAG' status and compared against the progress reported in 2023.

Chapter 4 provides an overview of the **Local Single Sky Implementation Plan** progress that the UK uses to report to EUROCONTROL. The chapter also discusses overlapping initiatives between the UK and the European Union.

Chapter 5 provides an update from the Airspace Modernisation Strategy Co-sponsors regarding the UK CAA's internal Airspace Modernisation Strategy governance. Part 3 development and plans for the UK Airspace Design Service (previously known as the Single Design Entity project) are explained, along with the status of projects funded by the Airspace Modernisation Strategy Support Fund. An overview is provided on activity to define the Airspace Modernisation Strategy fourth strategic objective (environmental sustainability) and on a project to review the UK's Pilot Common Project Regulation.

Chapter 6 provides an update on the Future of Flight Programme, consisting of various projects contributing to the advancement of aviation. The UK CAA plays a key role in the establishment of regulatory frameworks and processes relevant to the Programme, including engagement with stakeholders.

The Airspace Modernisation Strategy contains the following nine delivery elements:

(Four) Aircraft-Based Navigation Elements:


UK-ABN/Element 1. Trajectory-Based Operations


UK-ABN/Element 2. Terminal Airspace Redesign


UK-ABN/Element 3. Network Management


UK-ABN/Element 4. Integration

(Five) Airspace Management Elements:


UK-AM/Element 5. Airspace Management


UK-AM/Element 6. Data Services


UK-AM/Element 7. Future Surveillance and Spectrum


UK-AM/Element 8. Integration of Communications, Navigation, Surveillance and Spectrum


UK-AM/Element 9. Aircraft Capabilities

1 Airspace Modernisation Risks & Mitigations

Airspace Modernisation Delivery Monitoring and Oversight Process

1.0 With a diverse set of disparate teams, across seven organisations delivering over 100 projects and utilising multiple project management frameworks, 2024 saw enhanced engagement and further alignment work between responsible delivery entities and the Airspace Modernisation Oversight team, on delivery risk and reporting structures, to ensure consistency of risk and progress narrative in reporting.

1.1 The progress status for each element of the Airspace Modernisation Strategy, represented by red, amber and green, was refined to provide consistency in status throughout the governance structure. This status and its parameters were agreed at the UK CAA ExCo Airspace Board in Q4 2024. While this applies a delivery focus to both the annual progress report and governance reporting, it escalates the delivery risks to a strategic level, to enable prompt action where appropriate.

1.2 As the Airspace Modernisation Strategy evolves, the Airspace Modernisation Oversight team recognises the critical importance of a robust risk management framework, underpinned by strong portfolio management, to support the successful implementation of Airspace Modernisation initiatives.

1.3 In Chapters 2 and 3, we set out our assessment of each element and how delivery has progressed in 2024. At a strategic level, the UK CAA uses this progress report to raise risks with the Secretary of State for Transport for consideration of mitigating actions to be taken. These are summarised below.

Key Strategic Risks & Mitigations

Industry Synchronisation of the Technological Enablers for Airspace Modernisation with Airspace Change Deployments

BACKGROUND

1.4 NATS (En Route) plc have a requirement to modernise their technical infrastructure, to both enable modernisation and transition to a modernised landscape. Due to the complexity of major airspace change and technological transformation, both the NATS (En Route) plc Deployment Point En Route Programme and ACOG led Masterplan Programme have experienced delays.

1.5 For industry to implement the major airspace change proposals under the Masterplan Programme and the required NATS (En Route) plc technical infrastructure upgrades to enable modernisation, the advice provided by NATS (En Route) plc indicates a window of 12 months between deployments to facilitate the training required and to minimise risk of disruption to successfully transition operations.

RISK

1.6 Unless deployments are synchronised and coordinated effectively, the delivery of airspace change, and the subsequent intended benefits may be impacted or delayed.

MITIGATIONS

1.7 NATS (En Route) plc have undertaken a prioritisation review across their technological and airspace change portfolios. A decision was made to prioritise the Deployment Point En Route Programme ahead of the Free Route Airspace Programme to better sequence the delivery of enabling technologies.

1.8 NATS (En route) plc are conducting a review to understand the impacts of the delays to the Deployment En Route Programme to better understand the wider implications for airspace modernisation; the outputs of this are expected in Q2 2025.

1.9 The UK CAA and DfT have started work to establish joint processes and procedures to facilitate prioritisation, synchronisation and coordination of airspace deployments.

1.10 The UK CAA and DfT remain closely engaged with NATS (En Route) plc to better understand the nature of the challenges and where necessary to provide support and guidance to assist coherence across the Airspace Modernisation Strategy.

REQUIRED DECISIONS OR DIRECTION:

1.11 Current mitigation satisfactory; no action required.

Non-Compliance with Assimilated Legislation Derived from The European Pilot Common Project (Commission Implementing Regulation (EU) No 716/2014)

BACKGROUND

1.12 Commission Implementing Regulation (EU) 716/2014 the Pilot Common Project (PCP) was retained on the UK's departure from the EU and has been assimilated into UK law. The regulation was a pilot initiative to implement air traffic management functionalities, based on the Single European Sky Air Traffic Management Research (SESAR) solutions, in a coordinated and synchronised manner.

1.13 The EU carried out a review of the Pilot Common Project and concluded that, while it achieved positive operational changes to European air traffic management, the variable level of maturity for implementation and its impact on the synchronisation of their implementation reduced the effectiveness. Therefore, the EU closed the pilot phase of common projects and evolved the Pilot Common Project with an updated focus.

1.14 The UK's assimilated Pilot Common Project has not been amended to reflect the changes made within the EU, apart from amendments to implementation dates by UK Statutory Instrument 2022 No.211.

RISK

1.15 The named operators in the assimilated Pilot Common Project are likely to be non-compliant with a limited number of the air traffic management functionalities required by the extant legislation.

MITIGATIONS

1.16 The UK CAA Common Project Coordination Group is collaborating with impacted organisations like Heathrow, Gatwick, Manchester Airports Group and NATS (En Route) plc to develop and recommend courses of action for selection by the Airspace Modernisation Strategy Co-Sponsors.

1.17 Initial options are planned to be presented to the UK CAA Airspace Modernisation Strategy Board in Q1 2025, for decision on next steps.

REQUIRED DECISIONS OR DIRECTION

1.18 Current activities to develop mitigation are satisfactory; no action is currently required.

Resource and Funding Challenges in Airspace Modernisation

BACKGROUND

1.19 In the current delivery model, sponsors of airspace change in the Masterplan Programme fund their airspace change proposals. However, each sponsor of the airspace changes within that cluster of the airspace change masterplan[10] may not have the available funding or resource required to progress to the timescales required.

1.20 Several of the policy areas of modernisation being led by the UK CAA in the Future of Flight programme are supported by to government funding, which needs to be renewed each year. The resource required to develop and deliver these policy-led areas is also dependent on this funding.

[10] About the masterplan | UK Civil Aviation Authority

RISK

1.21 There is insufficient resource or funding to modernise at the pace, and to the required standards, to meet the timelines expected by the Government and stakeholders.

MITIGATIONS

1.22 The UK CAA is recruiting to meet resource requirements to deliver the policy concepts outlined in the Airspace Modernisation Strategy Part 3.

1.23 The AMS Co-sponsors initiated a project and consulted on the options in 2024, to identify how a new single entity (UK Airspace Design Service), responsible for airspace design, could better achieve the level of ambition set by the UK Airspace Modernisation Strategy.

1.24 Funding options for the UK policy requirements for integration were submitted by the UK CAA Future of Flight team to the DfT for consideration in Q4 2024; an outcome is expected in Q1 2025.

REQUIRED DECISIONS OR DIRECTION

1.25 Request a DfT decision on the proposed funding options for the UK CAA policy-led areas under element 4 integration.

1.26 Ministerial and UK CAA Board decision on UK Airspace Design Service proposals by Q2 2025.

Airspace Modernisation Strategy International Alignment and Coordination

BACKGROUND

1.27 The Airspace Modernisation Strategy is UK focussed by design but international by its implementation.

1.28 There is a requirement to synchronise modernisation and align with international delivery to aid interoperability.

RISK

1.29 UK modernisation efforts become incoherent, desynchronised or unable to leverage enabling capabilities with supporting international elements; thereby making the Airspace Modernisation Strategy less effective, efficient and deliverable.

MITIGATIONS

1.30 The UK CAA is actively engaging internationally to ensure that the Airspace Modernisation Strategy remains aligned to international plans.

1.31 The UK CAA is actively looking at how the Airspace Modernisation Strategy Part 3 needs to evolve in line with global aspirations, with updates to the Part 3 expected annually.

REQUIRED DECISIONS OR DIRECTION

1.32 Current mitigation is satisfactory; no action required.

Airspace Modernisation Strategy – 2024 Element Delivery Risk Status

UK-ABN/1. Trajectory Based Operations

1.33 While some positive progress has been made under this element, the worsening red status is driven by uncertainties around the delivery of Free Route Airspace, coupled with the reliance on the Deployment Point En Route Programme (iTEC SkyNex) to fully realise the benefits of cross border Free Route Airspace. Additionally, minor delays to Performance Based Navigation milestones have contributed to this worsening status. Risks to progress include further delays to the NATS (En Route) plc Deployment Point En Route programme and capacity within the rulemaking process for Performance Based Navigation. The Performance Based Navigation consultation was also delayed due to the general election.

1.34 Mitigating actions include NATS (En Route) plc reviewing their portfolio of programmes and exploring implications due to the dependency on Deployment Point En Route. Close engagement between the UK CAA Performance Based Navigation lead and the DfT on rulemaking task capacity to understand constraints has also taken place.

1.35 The UK CAA has written to NATS (En Route) plc to understand in greater detail the causes for the delay in the Deployment Point En Route programme and what actions are proposed by NATS (En Route) plc to mitigate.

UK-ABN/2. Terminal Airspace Re-design

1.36 The ongoing red status is driven by delay to baselined milestones within the airspace change Masterplan. Risks to progress include funding, programme compression, quality and complexity. Mitigating actions in 2024 include the exploration of a potential alternative funding and delivery model, the UK Airspace Design Service, previously known as the Single Design Entity. The DfT/CAA consultation on this topic closed in December 2024. In March 2025, the Government confirmed that it will establish a UK Airspace Design Service and Support Fund, and that it was now working with NATS with the shared ambition for the UK Airspace Design Service to be up and running in 2025. A consultation response document with more detail will be published later in 2025.

1.37 There continues to be close collaboration between the ACOG, airspace change sponsors, UK CAA and the DfT. This collaboration has sought to progress airspace change that has been impacted by funding or other issues.

UK-ABN/3. Network Management

1.38 While progress has been made in 2024 in respect of NATS (En Route) plc Queue and Capacity Management, particularly with the successful delivery of Time-Based Separations Pairwise at Heathrow in December, the steady amber status is driven by the withdrawal of the Arrival Manager HeadBranch deployment in April due to technological issues and the ongoing risk relating to availability of specialist resource.

1.39 Mitigation actions include NATS (En Route) plc undertaking a portfolio prioritisation activity, securing resource for deployments.

UK-AM/5. Airspace Management

1.40 The ongoing amber status reflects the risks associated with this element, mainly in respect of Flexible Use of Airspace, such as difficulty in integrating space and high-altitude operations with current airspace users, potential financial penalties for delays caused by activating Special Use Airspace, lack of commercial representation in airspace management, challenges in establishing cross-border airspace protocols, and the need for assured data transfer for safety-related decisions.

1.41 Mitigating activities in 2024 include development of detailed delivery plans due for completion in 2025 informed by the Airspace Modernisation Strategy Part 3 milestones, engagement with industry and recruitment of further resource into the relevant UK CAA teams.

UK-AM/6. Data services

1.42 The ongoing red status is driven by delays to the UK CAA System Wide Information Management milestones, delays that result from insufficient resources. Additionally further delay to the NATS (En Route) plc Deployment Point En Route programme and dependencies, in some areas of modernisation, on the technological enablers have contributed to this status. Risks to progress include resource, complexity and the dependencies on this area. Mitigating actions in 2024 include recruitment of a UK CAA System Wide Information Management lead, detailed scoping of the System Wide Information Management project and the start of a recovery action plan by NATS (En Route) plc to understand Deployment Point En Route delays and dependencies.

1.43 The UK CAA has written to NATS (En Route) plc to understand in greater detail the causes for the delay in the Deployment Point En Route programme and what actions are proposed by NATS (En Route) plc to mitigate.

UK-ABN/4. Integration
UK-AM/7. Future Surveillance and Spectrum
UK-AM/8. Integration of Communications, Navigation, Surveillance & Spectrum
UK-AM/9. Aircraft Capabilities

1.44 The ongoing amber status reflects the funding risk for areas of work under these four UK CAA policy-led elements, absence of detailed delivery plans and availability of specialist resource.

1.45 Mitigating activities in 2024 include the submission of funding requests to the DfT for consideration, areas of work maturing allowing the UK CAA to develop detailed delivery plans due in 2025 informed by the Airspace Modernisation Strategy Part 3 milestones and recruitment of further resource into the relevant UK CAA teams.

2 Progress Overview 2024 – UK CAA Policy Development

Airspace Modernisation Strategy Part 3 UK CAA Milestones

2.0 This chapter presents an update on the 2024 progress made by the UK CAA with policy development in support of the relevant elements of the Airspace Modernisation Strategy (CAP 1711), in accordance with their published delivery plans (CAP1711b).

2.1 CAP 1711b Airspace Modernisation Strategy Part 3: Deployment Plan published in July 2024 outlines delivery milestones based on the strategic objectives and delivery elements established in Airspace Modernisation Strategy Parts 1 and 2. These milestones are designed to support the implementation of airspace modernisation initiatives over the short (0–2 years) and medium-to-long term (3–7 years), and are informed by regulatory commitments, ongoing projects and planned activities within the UK CAA. They also reflect national and international aviation policies, technological advancements and industry priorities.

2.2 Stakeholder engagement has played a key role in shaping these milestones, with input from airspace users, industry representatives, government bodies and international organisations. The CAP 1711b Airspace Modernisation Strategy Part 3: Deployment Plan provides an overview of projects already in progress or scheduled to commence, as well as those under consideration for future implementation. Airspace Modernisation Strategy Part 3 acknowledges that airspace modernisation is a dynamic process, subject to adjustments as new challenges and opportunities emerge.

Framework for Airspace Modernisation Strategy Delivery Milestones

2.3 The delivery milestones in the Airspace Modernisation Strategy Part 3 are structured around key guiding frameworks and strategic influences, including:

Airspace Modernisation Strategy Strategic Objectives: The Airspace Modernisation Strategy is guided by four overarching objectives: safety, integration, simplification and environmental sustainability. These objectives provide a structured approach to modernisation efforts and define a more efficient and sustainable airspace system. The strategy is divided into nine delivery elements, as outlined in the introduction of this report, which collectively shape the framework for UK airspace modernisation.

International Civil Aviation Organization's Global Air Navigation Plan: The Airspace Modernisation Strategy aligns with the International Civil Aviation Organization's (ICAO) Global Air Navigation Plan (GANP), ensuring that UK airspace modernisation remains consistent with global aviation standards and best practices.

Stakeholder Engagement: The development of delivery elements and associated milestones has been shaped by input from industry partners, airspace users and other stakeholders, ensuring alignment with the needs and expectations of the aviation community.

Monitoring and Assessment of Progress

2.4 To track progress effectively, the UK CAA has implemented a monitoring framework that includes:

- Annual Updates: CAP 1711b is refreshed annually to reflect progress and incorporate upcoming milestones within a 'two plus five years' planning framework.[11]
- Reporting: The UK CAA provides regular updates on the status of Airspace Modernisation Strategy implementation through the Airspace Modernisation Strategy governance structure to the Co-sponsors and through stakeholder engagement with industry, ensuring transparency and accountability in the modernisation process.

2.5 This structured approach supports the realisation of the Airspace Modernisation Strategy's strategic objectives and ensures that UK airspace modernisation progresses in a coordinated and efficient manner.

Delivery Milestones Overview

2.6 The graphics below provide an overview of progress with UK airspace modernisation in 2024 by reference to the UK CAA Delivery Milestones set out in the July 2024 edition of Part 3 of the Airspace Modernisation Strategy. These graphics serve as a prelude to the progress updates that follow in this chapter, where their alignment with Airspace Modernisation Strategy Part 3 will be captured in greater detail. They also offer a forward-looking perspective on upcoming project milestones, categorising them based on their status. The use of colour-coded indicators distinguishes between milestones that have been achieved, those not yet started, those not achieved and those planned, providing a clear and structured representation of progress and future objectives.

[11] Airspace Modernisation Strategy Part 1: Strategic Objectives and Enablers was also updated in February 2024 to remove two paragraphs relating to the 'growth duty' that had been included in error (formerly B38 and B39 in Annex B).

Milestone Status Indicators:

- Green = Achieved
- Red = Not Achieved
- Blue = Planned

2.7 The status of Part 3 milestones for 2024 is as follows:

AMS Part 3 Timelines (1 of 2)

- Completed (Green) – Performance Based Navigation Implementation: Required Navigation Performance approaches at airports with approach control
- Completed (Green) – Publish updated safety buffer policy for Special Use Airspace

2024	2025	2026	2027-2030	2030+	
	●				Develop and publish new legislation and AMC/GMC for PBN
	●				Publish update to CAP1385, PBN: Enhanced route spacing requirements
	●				Publish update to CP 1378, PBN: Airspace design guidance
	●				Produce an updated UK PBN Implementation Plan
				●	Produce a UK concept for the future use of vertical navigation utilising a satellite-based navigation system
				●	PBN implementation: RNP approaches at airports with approach control
●					PBN implementation: RNP approaches at airports without approach control
	●				PBN implementation; point in space (PinS) procedures for heliports
		●			Requirements and policy for determining the areas where air traffic services are provided
			●		Develop updated policy on the airspace structures to support aerodromes operating in uncontrolled airspace
				●	Develop requirements and policy relating to the integration of high altitude operations
	●				Review airspace design and classification to ensure that it is fit for purpose and maintains a high standard of safety
●					Publish updates safety buffer policy for Special Use Airspace design
	●				Publish EC standards for the integration of airspace users
	●				Publish guidance on the application of EC standards for different operations and volumes of airspace
	●				Complete human factors review and update pilot training guidance to accommodate EC standards
	●				Examine options to encourage or compel the adoption of EC equipage in the required timeframes
			●		Onward roadmap to full adoption of airborne EC creating known and complete traffic picture
	●				Complete trial(s) of FIS-B installations in a managed environment to guide standards development
	●				Publish FIS-B requirements specifications and performance standards
		●			Set commercial framework for the provision of local and regional TIS-B services
			●		Deployment concept for delivery of improved UK alignment with ICAO FIS provisions

AMS Part 3 Timelines (2 of 2)

- Completed (Green): Develop and publish Detect and Avoid (DAA) Policy
- Completed (Green): Publish policy concept on Remotely Piloted Aircraft Systems Beyond Visual Line of Sight operation in Atypical Air Environments
- Not Completed (Red): Develop UK System Wide Information Management Implementation Framework

2024	2025	2026	2027-2030	2030+	
				●	Deployment of a digitised Lower Airspace Service
			●		Enable the use of enhanced functions of a flight information display by FISOs
			●		Develop and publish traffic management concept and policy for new and diverse airspace users
	●				Review rules of the air (SERA) right-of-way
	●				UK SORA Air Risk (Model) Classes (ARCs) for RPAS integration with crewed aircraft
●					Develop and publish Detect and Avoid (DAA) policy
	●				Expand DAA policy to cover non-aircraft threats
●					Publish policy concept on RPAS BVLOS operations in Atypical Air Environments
	●				Publish policy on RPAS BVLOS operations in Atypical Air Environments
			●		Input of results from BVLOS sandbox trials utilising a TRA (+TMZ) in non-segregated airspace (Class D, E & G) to inform policy updates
●					Develop UK SWIM Implementation Framework
	●				Implement a national UK SWIM infrastructure
				●	Introduce Flight and Flow Information for a Collaborative Environment
			●		Air/Ground SWIM for non-safety Critical Information
				●	Air/Ground SWIM for safety Critical Information
	●				Updated rationalisation programme for existing ground infrastructure to provide GNSS failure resilience to suitable equipped aircraft (development of MON)
	●				Provide input into a UK Space Agency (UKSA) outline business case for a UK SBAS
				●	Develop a UK framework for dual-frequency multi-constellation SBAS
	●				Policy decision and Ofcom endorsement for allocation of 978MHz to provide additional ADS-B capacity
				●	Establish common infrastructure requirements for the provision of LAS

2.8 This chapter presents an update on the 2024 progress made by the UK CAA under the relevant elements of the Airspace Modernisation Strategy (CAP 1711), in accordance with the published delivery plans (CAP 1711b) [12]. These elements are in two categories: Aircraft-Based Navigation and Airspace Management.

2.9 The summary below for each relevant element reflects the progress made in 2024, with a status rating of red, amber or green based on the current published baseline, as defined in the Introduction section of this report.

[12] CAP 1711b: Airspace Modernisation Strategy Part 3: Deployment Plan

Element 1: Trajectory-based Operations

- **Outcome status is AMBER**
- **Overall Progress status is GREEN**
- **Timeliness status is AMBER**
- **Delivery Lead / Target Date: UK CAA (Q4 2028)**

Performance-Based Navigation Policy and Regulation:

- Develop & Publish New Legislation and AMC/GM for PBN
- Publish Update to CAP 1385, PBN: Enhanced Route Spacing Requirements
- Publish Update to CAP 1378: Airspace Design Guidance
- Produce an Updated UK PBN Implementation Plan
- Produce a UK Concept for the Future Use of Vertical Navigation Utilising a Satellite-Based Navigation System
- Produce an Updated UK PBN Implementation Plan

Performance-Based Navigation Policy and Regulation

Develop and Publish New Legislation and Acceptable Means of Compliance/Guidance Material for Performance Based Navigation

BACKGROUND

2.10 Performance Based Navigation provides the basis to enable modernised airspace utilising the aircraft navigation capabilities to provide route design opportunities that contribute to industry sustainability ambitions. The rulemaking activity will include regulation and associated Acceptable Means of Compliance.

TARGET DATE

2.11 Q3 2025

PROGRESS

2.12 Consultation to seek views on proposals to update Performance Based Navigation legislation in the UK by amending and consolidating Assimilated Regulation (EU) 2018/1048 (the UK Performance Based Navigation Regulation) and the Performance Based Navigation elements contained within Assimilated Regulation (EU) No. 716/2014 (the UK Pilot Common Project Regulation) were ongoing in December 2024. This was delayed from the anticipated date of June 2024 due to the pre-election period. The revised forecast date for this milestone is now May 2026. Delivery of future rulemaking Statutory Instrument is subject to resources and parliamentary timescales, with the current assumption of a single slot available for such rulemaking per annum.

Publish Update to CAP 1385, Performance Based Navigation: Enhanced Route Spacing Requirements

BACKGROUND

2.13 CAP 1385 provides the industry guidance on route-spacing methodologies and analysis using Performance Based Navigation as the basis for navigation performance. This element represents the use of advanced features of Performance Based Navigation in design of arrival procedures to provide more flexibility in airspace design, leading to greater efficiency in the terminal area and increased capacity.

TARGET DATE

2.14 Q4 2025

PROGRESS

2.15 Planning has commenced for stakeholder mapping and required updates to documentation. Currently on track for delivery in Q4 2025.

Publish Update to CAP 1378, Performance Based Navigation: Airspace Design Guidance

BACKGROUND

2.16 CAP 1378 provides guidance on a range of design options for Performance Based Navigation arrival and departure procedures, outlining the potential benefits and impacts certain solutions may have on noise for local communities.

TARGET DATE

2.17 Q4 2025

PROGRESS

2.18 Planning has commenced for stakeholder mapping and required updates to documentation. Currently on track for delivery in Q4 2025.

Produce an Updated UK Performance Based Navigation Implementation Plan

BACKGROUND

2.19 Following consultation on the revised Performance Based Navigation legislation, an updated national Performance Based Navigation implementation plan will be published, informed by industry plans for deployment in accordance with the proposed legislation.

TARGET DATE

2.20 Q1 2025

PROGRESS

2.21 The start of the project has been delayed due to the delays to the Performance Based Navigation consultation. A revised delivery date has been set for Q4 2026.

Produce a UK Concept for The Future Use of Vertical Navigation Utilising a Satellite-Based Navigation System

BACKGROUND

2.22 Develop a concept of operation in association with Performance Based Navigation to redefine airspace containment criteria to protect Air Traffic Service routes.

TARGET DATE

2.23 2030+

PROGRESS

2.24 Industry research and development activity in this area is ongoing, with standards required to support development of the UK policy/guidance material.

Performance Based Navigation Implementation: Point in Space (PinS) Procedures for Heliports

BACKGROUND

2.25 Performance Based Navigation Point in Space procedures provide a published flight procedure for helicopters to regularly used landing sites (such as hospitals, offshore platforms etc).

TARGET DATE

2.26 Q1 2025

PROGRESS

2.27 Development of the policy has been delayed from Q1 2025 and is currently on pause while a rulemaking task proposing amendments to Annex 14 Volume 2 heliport (vertiport) certification is underway. This activity will support in identifying options for Point in Space procedures for heliports.

Element 4: Integration

- **Outcome status is AMBER**
- **Overall Progress status is AMBER**
- **Timeliness status is AMBER**
- **Delivery Lead / Target Date: UK CAA (Q4 2028)**

Flight Information Service Broadcast (FIS-B) Deployment:

- UK Align-B2/5: Determine use of automated services (FIS/TIS-B Type)
- UK Align-B2/6: Implement Automated services (Basic)

Traffic Information Service Broadcast (TIS-B) Deployment:

- UK Align-B2/5: Determine use of automated services (FIS/TIS-B Type)
- UK Align-B2/6: Implement Automated services (Basic)

RPAS BVLOS Operations in Segregated and Non-Segregated Airspace:

- UK-ABN/4 Integration
- UK-AM/5 Airspace Management
- UK-AM/5 Data Services
- UK-AM/5 Future Surveillance and Spectrum

2.28 Delivery Element 4, Integration, focuses on the growing demand for UK airspace from both existing and new aviation operations, not only in terms of volume but also in the complexity of interactions between different performance capabilities. To ensure safe integration, a more innovative and flexible approach to airspace structures and procedures is required. This is enabled through flexible access airspace structures, Electronic Conspicuity for accurate position data sharing, digitised airspace availability and operational information broadcasting, and the implementation of a new Internation Civil Aviation Organization aligned Lower Airspace Service to support diverse users. Additionally, procedures and processes for high-altitude airspace management will facilitate the integration of high-altitude platform systems and supersonic/hypersonic operations.

2.29 The timeliness status of this element is driven by delays to the Airspace Modernisation Strategy Part 3 milestones for the areas listed below. The outcome status is driven by the maturity of these areas of work, complexity, absence of detailed delivery plans and future funding uncertainty.

Electronic Conspicuity

BACKGROUND

2.30 Electronic Conspicuity is an umbrella term for the technology that can help pilots, unmanned aircraft users and air traffic services be more aware of what is

operating in the surrounding airspace. Electronic Conspicuity including the devices fitted to or carried on aircraft, unmanned systems that send out the information, and the supporting infrastructure to help them work together. Airborne transponders, air traffic data displays, ground-based antennas and satellite surveillance services are all examples of Electronic Conspicuity.

2.31 The information generated by these can be presented to pilots and air traffic services to provide them with information on other traffic nearby. This strengthens the fundamental safety principle of 'see and avoid' by adding the ability to 'detect and be detected'. To be most effective it needs 100% of users operating in a designated block of airspace using compatible Electronic Conspicuity devices to detect and be able to be detected by others.

2.32 Electronic Conspicuity can play a vital role in four key areas to support the AMS:

- Enabling the on-going modernisation of the UK's airspace structure and route network.
- Helping to mitigate the risk of mid-air collisions in Class G airspace and infringements into controlled airspace.
- Enabling the safe and efficient integration of unmanned aircraft
- Providing the ability to share accurate navigation position data between airborne devices and ground (or indeed space-based) systems.

TARGET DATE

2.33 Q4 2028

PROGRESS

2.34 The Concept of Operations research and analysis phases started at the end of 2023. This involved five studies, which were brought together into an overarching report:

- Study 1: Frequency Management (978 & 1090MHz)
- Study 2: Probability of Detection
- Study 3: Air Risk Ministry of Defence
- Study 4: Airspace Architecture
- Study 5: Human Factors

2.35 All study reports are now complete and informing the drafting of the Electronic Conspicuity Version 1 Concept of Operations, with the aim to bring this to internal governance for sign off in Q1 2025 and the DfT governance early in Q2 2025. Following this UK CAA plans to conduct industry engagement and further testing

through live trials to refine and validate the Concept of Operations with a view to creating an updated version by Q4 2025.

2.36 In addition, UK CAA have been working with Ofcom to enable the licensing of 978MHz for use by uncrewed aircraft. The development work required has now been completed, and final policy updates and communication materials are under draft with an aim to launch in March 2025.

Ground–Air/Air–Air Detect and Avoid

UK Specific Operations Risk Assessment Air Risk (Model) Classes (Arcs) for Remotely Piloted Aircraft System Integration with Crewed Aircraft

BACKGROUND

2.37 The scope of this work is to define a UK framework to allow integration of crewed and uncrewed air systems in UK airspace classifications.

TARGET DATE

2.38 Q1 2025

PROGRESS

2.39 The Specific Operations Risk Assessment policy concept was endorsed at the March 2024 Airspace Integration Steering Group. Consultation with industry was completed in Q3 2024. This policy is due to be published by Q1 2025.

Develop And Publish Detect and Avoid Policy

BACKGROUND

2.40 A Detect and Avoid policy is one of the foundational policies required to enable Remotely Piloted Aircraft Systems Beyond Visual Line of Sight within the UK Air Risk Model. The UK CAA Detect and Avoid Delivery Group is drafting a policy that covers all classes of airspace and Remotely Piloted Aircraft System categories. The initial priority is lower risk airspace and specific category Remotely Piloted Aircraft Systems, but this will be expanded to larger Remotely Piloted Aircraft Systems and higher risk airspace.

TARGET DATE

2.41 Q1 2026

PROGRESS

2.42 The Detect and Avoid policy concept was published in July 2024; this version of the policy concept focuses on interactions between Unmanned Aircraft Systems and crewed aircraft. Consultation with industry was carried out and responses are under review. The policy concept will now undergo testing through trials and

sandbox activity during 2025, with the aim to produce an updated policy concept by Q4 2025, which also addresses Unmanned Aircraft System to Unmanned Aircraft System interactions.

Expand Detect and Avoid Policy to Cover Non-Aircraft Threats

2.43 This project focuses on expanding the Detect and Avoid policy to cover non-aircraft threats to Remotely Piloted Aircraft Systems Beyond Visual Line of Sight operations e.g. wildlife.

TARGET DATE

2.44 Q4 2025

PROGRESS

2.45 This milestone is currently under review and may slip from this target date, this is due to other priorities within the workstream.

Air Traffic Management for Integration

Develop and Publish Traffic Management Concept and Policy for New and Diverse Airspace Users

BACKGROUND

2.46 This area of work will require the identification of the Air Traffic Management services and supplementary services that will be necessary to enable the integration of diverse airspace users in existing UK airspace. Those services applicable in the UK will be identified in the Technical Requirements (TR). The Authority Requirements (AR) and the Organisational Requirements (OR) of any service provider will be identified by the UK CAA using a sandbox activity.

TARGET DATE

2.47 Q2 2027

PROGRESS

2.48 A Version 1 Unmanned Traffic Management concept of operations has been developed and is currently undergoing internal review. It builds on applicable learnings from both European Union Aviation Safety Agency and the Federal Aviation Administration. Once internal reviews are complete in Q2 2025, the intention is to test through trials and industry engagement.

2.49 Engagement with potential Unmanned Aircraft Systems Traffic Management Service Providers and existing air navigation service providers is ongoing to test the applicability of regulation UK Reg (EU) 2017/373 to Unmanned Aircraft

Systems Traffic Management Service Providers. Alongside the Law Commission review[13] this will help inform any new rulemaking required.

2.50 Confirmation is required on whether new rulemaking will be necessary, due to the complexity and volume of work involved. If new rulemaking is required, the timeframe for completion remains uncertain, however testing and trials are planned to commence in Q2 2025.

Review Standardised European Rules of the Air (SERA) Right-Of-Way

BACKGROUND

2.51 This project focuses on the review and recommendation on amendments to SERA.3205 (proximity) and SERA.3210 (right-of-way) to accommodate Unmanned Aircraft Systems.

TARGET DATE

2.52 Q2 2025

PROGRESS

2.53 The Standardised European Rules of the Air Action Group have completed their work to review specific aspects of the Standardised European Rules of the Air. Work focussed on two areas SERA.3205 (proximity) and SERA.3210 (right-of-way), with recommendations from the work to go through UK CAA governance for approval in Q1 2025.

Remotely Piloted Aircraft System Beyond Visual Line of Sight Operations in Atypical Air Environment Deployments

Publish Policy Concept on Remotely Piloted Aircraft Systems Beyond Visual Line of Sight Operations in Atypical Air Environments

BACKGROUND

2.54 Operating within an Atypical Air Environment should reduce the likelihood of a mid-air collision between an Unmanned Aircraft and other conventionally piloted aircraft. The adoption and recognition of an Atypical Air Environment is an innovative concept in the UK. The initial policy position will evolve as understanding of how Atypical Air Environments are used matures. The policy is to be considered in addition to any Regulation and Accepted Means of

[13] Law Commission consultation on uncrewed aircraft systems traffic management ("UTM") - Ministry of Justice - Citizen Space

Compliance/Guidance Material that is applicable to Unmanned Aircraft System operations.

TARGET DATE

2.55 Q2 2024

PROGRESS

2.56 In 2024, the UK CAA developed a policy framework to facilitate Beyond Visual Line of Sight operations of Remotely Piloted Aircraft Systems within Atypical Air Environments.

2.57 In February 2024, the UK CAA initiated a consultation to gather industry feedback on its proposed policy for recognising Atypical Air Environments. This consultation aimed to define Atypical Air Environments and establish guidelines for Remotely Piloted Aircraft Systems Beyond Visual Line of Sight operations within these environments. The consultation concluded in April 2024.

2.58 In October 2024, the UK CAA published CAP 3040 Unmanned Aircraft Operations in an Atypical Air Environment: Policy Concept[14]. This document outlines the criteria for defining Atypical Air Environments and establishes operational guidelines for Remotely Piloted Aircraft Systems Beyond Visual Line of Sight flights within these areas.

2.59 In December 2024, the UK CAA released a second edition of the policy concept, updating references to Radio Technical Commission for Aeronautics (RTCA) performance standards related to Electronic Conspicuity mitigation. This update enhances safety measures for Beyond Visual Line of Sight operations within Atypical Air Environments.

Publish Policy on Remotely Piloted Aircraft Systems Beyond Visual Line of Sight Operations in Atypical Air Environments

BACKGROUND

2.60 This project focuses on updating policy, based on lessons learned from initial publication of the Atypical Air Environment policy concept, to enable scaled operations within an Atypical Air Environment.

TARGET DATE

2.61 Q2 2025

PROGRESS

2.62 Original Policy Concept was published in October 2024 with a second edition, incorporating minor amendments, published in December 2024. While CAP 3040's second edition has facilitated advancements in Beyond Visual Line of

[14] CAP3040: Unmanned Aircraft Operations in an Atypical Air Environment: Policy Concept

Sight operations within Atypical Air Environments, the industry continues to adapt to its requirements. Ongoing dialogue between the UK CAA and stakeholders is essential to address challenges and harness opportunities in this evolving regulatory landscape.

Remotely Piloted Aircraft Systems Beyond Visual Line of Sight Operations in Segregated and Non-Segregated Airspace Deployments

Input of Results from Beyond Visual Line of Sight Sandbox Trials Utilising a Temporary Reserve Area (+ Transponder Mandatory Zone) in Non-Segregated Airspace (Class D, E and G) to Inform Policy Updates

BACKGROUND

2.63 Outputs from Beyond Visual Line of Sight sandbox trials will provide evidence and operational lessons to support development of future Air Traffic Management/Air Navigation Service requirements for integration, including that of Advanced Air Mobility operations. Policy development will remain dependent on outputs from other activities such as Electronic Conspicuity and Detect and Avoid.

TARGET DATE

2.64 Q1 2027

PROGRESS

2.65 Detect and Avoid policy concept was published in July 2024 and is now undergoing testing through trials and sandbox activity, which will contribute to the outcomes of this project. This milestone at this stage is on track.

Flight Information Service Broadcast (FIS-B) Deployments

Complete Trial(s) and Investigation of Flight Information Service Broadcast Installations in a Managed Environment to Guide Standards Development

BACKGROUND

2.66 Flight Information Service Broadcast will automatically transmit a range of national and regionally focussed aeronautical and meteorological information products as specified by the UK CAA and sourced from the UK aeronautical and meteorological information service providers, including Meteorological Aerodrome Reports (METARs), Terminal Airspace Forecasts (TAFs), Significant Meteorological Information (SIGMET) and Notice to Aviation (NOTAMs).

2.67 Meteorological Aerodrome Reports (METARs) are routine weather reports that are issued at regular intervals to provide current weather conditions including wind speed and direction, visibility, cloud cover, temperature, dew point and pressure.

2.68 Terminal Airspace Forecasts (TAFs) are weather forecasts for an airport that typically cover 24–30-hour periods and are used to anticipate weather conditions affecting take off, en-route flying, and landing. A Significant Meteorological Information (SIGMET) serves as an issued warning for severe weather conditions that may affect the safety of flights in a specific flight information region, and they cover hazardous phenomena such as severe turbulence, icing, volcanic ash and thunderstorms.

2.69 Notice to Aviation (NOTAMs) are an official advisory issued to pilots and flight operators regarding temporary changes in aeronautical facilities, procedures, or hazards. They can include runway closures, airspace restrictions, navigational aid failures and obstacles within specific flight paths.

2.70 These products will be available to aircraft that can receive data over 978 MHz (Universal Access Transceiver). Having current weather and aeronautical information in the cockpit will help pilots plan more safe and efficient flight paths, as well as make strategic decisions during flight to avoid potentially hazardous developing weather (although it should be noted that, given service limitations and potential quality assurance issues, Flight Information Service Broadcast will not be for use as a primary means of navigation or for tactical decision-making and the approved sources of authoritative information remains the UK Aeronautical and Meteorological Service Providers).

2.71 A technical trial has already been completed. Further investigation into the operation of Flight Information Service Broadcast to be completed.

TARGET DATE

2.72 Q1 2025

PROGRESS

2.73 UK CAA has employed a Ground Infrastructure subject matter expert to lead on the project, which commenced in November 2024. Detailed planning is currently underway to define scope and deliverables of the project. Ground Infrastructure technical requirements including Flight Information Service Broadcast and Traffic Information Service Broadcast are being drafted for trial testing and sandbox activity.

2.74 This milestone has been delayed, with a revised forecast of Q4 2025, due to the planning exercise underway to define the project’s scope and deliverables. While this milestone will complete later than anticipated it will not affect the overall delivery of the Flight Information Service Broadcast deployment.

Publish Flight Information Service Broadcast Requirements Specifications and Performance Standards

BACKGROUND

2.75 Minimum performance standards and specifications will be required for Flight Information Service Broadcast data link systems and equipment/aircraft equipment (avionics) intended to display (non-air traffic control related) aeronautical and meteorological information to pilots, to enhance their situational awareness. An approval process for display equipment/avionics (hardware/ software) will need to be established.

TARGET DATE

2.76 Q4 2025

PROGRESS

2.77 This milestone is currently on track to be delivered by the target date.

Complete Service Tender, Award and Licensing Process for a National Flight Information Service Broadcast Provider

BACKGROUND

2.78 The UK Flight Information Service Broadcast technical infrastructure (e.g. ground stations and datalink) is intended to be a state service, provided through a third-party provider, which will require a suitable funding mechanism and licensing process to be established.

TARGET DATE

2.79 Q2 2026

PROGRESS

2.80 This milestone is currently on track to be delivered by the target date.

Traffic Information Service Broadcast (TIS-B) Deployments

Complete Trial(s) of Traffic Information Service Broadcast Installations in a Managed Environment to Guide Standards Development

BACKGROUND

2.81 The UK dual-frequency strategy for Electronic Conspicuity will be supported through the provision of local, timely and accurate traffic information that enhances in-flight situational awareness and provides this traffic information across the necessary spectrum, to ensure all recipients receive the relevant information. Investigation into the operation of Traffic Information Service

Broadcast will be completed following the Electronic Conspicuity Ground Infrastructure study results.

TARGET DATE

2.82 Q1 2025

PROGRESS

2.83 UK CAA has employed a Ground Infrastructure subject matter expert to lead on the project, which commenced in November 2024. Detailed planning is currently underway to define scope and deliverables of the project. Ground Infrastructure technical requirements, including Flight Information Service Broadcast and Traffic Information Service Broadcast, are being drafted for trial testing and sandbox activity.

2.84 This milestone has been delayed, with a revised forecast of Q4 2025, due to the planning exercise underway to define the project's scope and deliverables. While this milestone will complete later than anticipated it will not affect the overall delivery of the Flight Information Service Broadcast deployment.

Publish Traffic Information Service Broadcast Requirements Specifications and Performance Standards

BACKGROUND

2.85 The integrity and accuracy of the Electronic Conspicuity position data to be broadcast and the timeliness of the ground system re-broadcast are fundamental to the provision of the right data at the right time to the airspace user. Electronic Conspicuity integrity and accuracy standards, ground infrastructure latency, recording and redundancy standards are required.

TARGET DATE

2.86 Q4 2025

PROGRESS

2.87 This milestone is currently on track to be delivered by the target date.

Set Commercial Framework for the Provision of Local and Regional Traffic Information Service Broadcast Services

BACKGROUND

2.88 The localised nature and technical integrity requirements mean the service may be delivered through a centralised or distributed model or mix. That choice may be dependent on the trial outputs and standards required. The aim is to enable the air navigation service providers to partially or fully discharge their responsibilities for the provision of surveillance enhanced traffic information via the option to transmit an integrated surveillance picture via Traffic Information

Service Broadcast. The working assumption is that there will be no economic regulatory requirement.

TARGET DATE

2.89 Q2 2026

PROGRESS

2.90 This milestone is currently on track to be delivered by the target date.

Element 5: Airspace Management

- **Outcome status is GREEN**
- **Overall Progress status is AMBER**
- **Timeliness status is RED**
- **Delivery Lead / Target Date: UK CAA (Q1 2031)**

Integrated Airspace Structures – Policy & Regulatory Framework:

- UK-ABN/3 Network Management; GANP NOPS
- UK-AM/4 Integration; GANP CSEP
- UK-AM/5 Airspace Management; UK FA

Airspace Classification Review:

- UK-ABN/4 Integration
- UK-AM/5 Airspace Management
- UK-FA-B1/1 Concept for Lower-Level Flexible Airspace Access Developed

Regulatory Enablers for Advanced Flexible Use Airspace:

- FRTO-B1/3 Advanced Flexible Use of Airspace (FUA) and of real time airspace
- FRTO-B2/2 Local Components of Dynamic Airspace Configurations (DAC)

Deployment of a Simplified Flight Information Service and Lower Airspace Service:

- ALP Mandate Task 0169 aligns with ICAO Global Air Navigation Plan (GANP)
- Align UK B1/1: Agree Alignment with ICAO PANSOP & SARPS
- UK FA-B1/1 Concept for Lower-Level Flexible Airspace Access Developed

BACKGROUND

2.91 Delivery Element 5, Airspace Management, focuses on the integration of various elements to enable the efficient use of UK airspace across both high-altitude and low-level operations. This is achieved through flexible access airspace structures that support low-level user integration, alongside procedures for managing high-

altitude operations. Additionally, flexible use of airspace management techniques ensures safe segregation when necessary, such as for military operations, training and space launches. Enhanced Electronic Conspicuity allows accurate navigation position data sharing, while the digitisation of airspace availability and operational information broadcasting supports improved situational awareness and operational efficiency.

TARGET DATE

2.92 Q1 2031

PROGRESS

2.93 The timeliness status of this element is driven by delays to the Airspace Modernisation Strategy Part 3 milestones for Flexible Use of Airspace. The outcome status is driven by the maturity of these areas of work and planned mitigation to resource risk.

Integrated Airspace Structures – Policy and Regulatory Framework Deployments

Requirements and Policy for Determining the Areas Where Air Traffic Services are Provided

BACKGROUND

2.94 International Civil Aviation Organization airspace classifications are used to ensure the appropriate air traffic services deliver a safely managed operation. The right-sized airspace volume with appropriate classification supports existing and new users but is fixed and notified through aeronautical information management. The long-term ambition is to deliver the right airspace volumes in a more flexible and real-time way. This activity will deliver requirements and policy for determining the areas where air traffic services are provided and the designation and design of airspace to support that provision.

TARGET DATE

2.95 Q4 2026

PROGRESS

2.96 The Airspace Management Cell is working with the UK CAA to ensure consistent application of Flight Planning Buffers within the Free Route and Air Traffic Service route environments. At this stage, this milestone remains on track.

Develop Updated Policy on the Airspace Structures to Support Aerodromes Operating in Uncontrolled Airspace

BACKGROUND

2.97 Policy to assist aerodrome operators in ensuring the safe operation at aerodromes operating in uncontrolled airspace e.g. through the use of a Radio Mandatory Zone.

TARGET DATE

2.98 Q1 2027

PROGRESS

2.99 In 2024, the UK CAA published CAP 413 Radiotelephony Manual, Edition 24[15]:, which became effective on 28 March 2024. This edition includes updates related to Radio Mandatory Zone operations to align with current communication procedures. At this stage this milestone remains on track.

Develop Requirements and Policy Relating to the Integration of High-Altitude Operations

BACKGROUND

2.100 High-Altitude Operations Integration Project aims to utilise airspace above the traditional airspace volume to date with a potential mix of operations. Work to develop policy and requirements in this area will initially be coordinated by the UK CAA Higher Altitude Platform Systems Delivery Group, although it is anticipated that this activity will produce policy and requirements by the beginning of Aviation System Block Upgrade Block 3 in 2031.

TARGET DATE

2.101 Q1 2031

PROGRESS

2.102 Following engagement with UK CAA High Altitude Operations stakeholders, the delivery group has agreed there is a low priority to progress this project. However, the delivery group established trigger metrics for mobilisation of the project in the future.

[15] UK CAA CAP413: Radiotelephony Manual Edition 24

Airspace Classification Review Deployments

Review Airspace Design and Classification to Ensure that it is Fit for Purpose and Maintains a High Standard of Safety

BACKGROUND

2.103 In accordance with the Civil Aviation Authority (Air Navigation) Directions 2023, and in support of the Airspace Modernisation Strategy strategic objectives, the UK CAA regularly reviews volumes of airspace using the process described in CAP 1991: Procedure for the UK CAA to Review the Classification of Airspace[16]. The recent and immediate focus for the UK CAA is the Manchester Low Level Route. On the basis of the CAP 2564: Airspace Classification Review – Manchester Low Level Route – 2023[17] report, submission to the UK CAA's Airspace Regulation department occurred in Q3 2024 with implementation planned for Q1 2025. Full details of the review including UK CAA recommendations can be found in CAP 2564.

TARGET DATE

2.104 Q1 2025

PROGRESS

2.105 In Q4 2024, the UK CAA approved changes to the Manchester Low-Level Route airspace so that it will be replaced by the EGR323 North-West Transit Corridor and reclassified as Class G airspace. This Class G airspace will have specific restrictions commencing on 20 February 2025.

2.106 This change enhances safety and offers efficiency by simplifying the airspace structure, mitigating any collision risks, and ensure smoother navigations between Manchester and Liverpool airports, specifically for general aviation pilots and the adjoining Class D airspace.

Regulatory Enablers for Advanced Flexible Use Airspace Deployments

Publish Updated Safety Buffer Policy for Special Use Airspace Design

BACKGROUND

2.107 The Flexible Use of Airspace concept is based on three levels of Airspace Management, Strategic (Level 1), Pre-Tactical (Level 2) and Tactical (Level 3). The UK CAA Safety and Airspace Regulation Group sits within Level 1 and formulates national Airspace Management policy and strategic plans. Level 2

[16] CAP 1991: Procedure for the CAA to Review the Classification of Airspace
[17] CAP 2564: Airspace Classification Review - Manchester Low Level Route - 2023

Airspace Management is the temporary allocation of airspace restrictions and reservations, while Level 3 airspace is the real-time management of airspace allocated at Level 2.

TARGET DATE

2.108 Q1 2031

PROGRESS

Flexible Use of Airspace Evaluation - Safety

2.109 Special Use Airspace is a generic term used for airspace volumes that are designated for specific operations which, because of their nature, may require limitations on airspace access to be imposed upon other aircraft not participating in those operations / activities. Special Use Airspace can be permanent or temporary. This task will review and, if necessary, refine extant policy considering all types of Special Use Airspace.

2.110 Special Use Airspace is designed and operated using robust safety management system processes to ensure activities are conducted safely. Operators of Special Use Airspace are required to monitor safety occurrence reports to ensure the continued safe operation of Special Use Airspace.

2.111 Two significant safety occurrences took place in 2024 relating to the incorrect promulgation of Danger Area activations, and some related minor occurrences with related factors. The Ministry of Defence conducted an Operational Safety Investigation which identified recommendations to reduce the risk of similar incidents occurring in the future. NATS (En Route) plc have also investigated Danger Area penetration risk spanning several years resulting in eight recommendations, several of which relate to the management of Airspace Management data. NATS (En Route) plc and the Ministry of Defence are working collaboratively to implement these recommendations, and many (such as changes to procedures and improved automation of data transfer) have already been implemented. However, technological enhancements are required to realise a fully automated end-to-end transfer of data.

Special Use of Airspace - Policy

2.112 In February 2024 the UK CAA published a new policy for the Establishment and Operation of Special Use Airspace[18] to provide clarity on the utilisation of Special Use Airspace in the UK. The policy enables some of the strategic objectives of the Airspace Modernisation Strategy while harmonising with neighbouring states where possible. It also includes a revised safety buffer policy, reducing the buffer requirements for some activities. The policy will enhance the integration of a

[18] Policy for the Establishment and Operation of Special Use Airspace

broader range of airspace users, including new entrants, and improve flexibility by applying Flexible Use of Airspace principles to all Special Use Airspace.

Advanced Flexible Use of Airspace

2.113 The RAF Fairford base faces a challenge with the implementation of the Advanced Flexible Use of Airspace, particularly in relation to operating large Remotely Piloted Aircraft Systems. Although the airspace change proposal has been approved by the UK CAA, there is a lack of policy or solution for aircraft flying above 50,000ft in the area, necessitating the establishment of an appropriate airspace structure. The UK CAA is currently working on facilitating operations within this context.

2.114 The milestone for the RAF Fairford Remotely Piloted Aircraft Systems airspace change proposal approval was achieved in May 2024. It is important to highlight that the successful delivery of the Advanced Flexible Use of Airspace is contingent upon the Ministry of Defence airspace change proposal sponsor meeting its gateways and sharing necessary information to enable NATS (En Route) plc to work efficiently. While progress has been made, the functionality of this initiative is reliant on the completion of other related activities.

2.115 NATS (En Route) plc are supporting the implementation of RAF High Altitude Long Endurance Remotely Piloted Aircraft Systems due in March 2025.

2.116 The Ministry of Defence is working with NATS (En Route) plc towards full implementation of airspace management and advanced flexible use of airspace. Local and Regional Airspace Tool (LARA) is currently used to enable this functionality for civil and military operations. Interoperability of airspace management support systems with the Network Manager via business-to-business connections has been implemented and is the primary method of airspace management data provision.

Flexible Use of Airspace - Capacity

2.117 Planned improvements in data collection and analysis will enhance the level of information available to determine Flexible Use of Airspace performance. The current performance metric for capacity in relation to Flexible Use of Airspace is measured by NATS (En Route) plc as delay attributable to military activity that segregates airspace from Network availability; this segregation typically occurs due to the activation of Danger Areas.

2.118 During 2024, 6658 minutes of military attributable Command and Control delay were recorded compared with 2275 minutes in 2023 and 7387 minutes in 2022. Analysis of the data shows that the Portsmouth danger areas are the most impactful; responsible for 2864 minutes of delay last year.

Flexible Use of Airspace - Efficiency

2.119 Efficiency is measured by comparing Special Use Airspace bookings with actual usage. Comparison of data from 2023 to 2024 for the most utilised Airspace Management Cell managed Special Use Airspace shows a similar level of activity and an increase in efficiency of approximately 10%. There is no single identifiable reason for this trend, but it is likely to be the cumulative outcome of continuous improvement. The accuracy of the data gathered in relation to this efficiency measurement cannot be guaranteed year on year, due to the manual collection of data. It is anticipated that more accurate data will be available from 2025, following Airspace Management Cell adoption of the Pan-European Repository of Information Support Civil-Military Performance Monitoring (PRISMIL-CURA) tool in Q4 2024.

Flexible Use of Airspace - Developments

2.120 The UK CAA published an update to CAP 740[19] UK Airspace Management Policy in May 2024. This update aligns the document with the UK CAA's policy for the Establishment and Operation of Special Use Airspace (SUA). The Flexible Use of Airspace oversight requirements for Special Use Airspace Authorities have been amended due to the diversification of operations within Special Use Airspace. The applicability of Level 2 and Level 3 Airspace Management has been expanded to include non- Airspace Management Cell managed Special Use Airspace to progress towards the strategic objectives of the Airspace Modernisation Strategy.

2.121 Deployment of the Local and Sub-regional Airspace Management Support System Web Booking Client to airspace users continues, which is freeing up Airspace Management Cell capacity and improving data input reliability. NATS (En Route) plc are assessing a change request to support the development of an automated Notice to Aviation (Digital NOTAM) capability. This will realise the benefit from the Network Manager's development of the Local and Sub-regional Airspace (LARA) Management Support System. The intent is to automate the Notice to Aviation process using System Wide Information Management (SWIM) capabilities to ensure that published data matches airspace reservation data held in the Local and Sub-regional Airspace Management Support System. In the interim, NATS (En route) plc is also investigating whether some local automation can be developed to extract airspace management data in respect of Local and Sub-regional Airspace and complete the Notice to Aviation template in the Extended Aeronautical Messaging Service, a system used by the military.

Flexible Use of Airspace - Audits

2.122 The introduction of the Special Use Airspace Policy has facilitated the audit of Special Use Airspace Authorities. Each Special Use Airspace structure shall be

[19] UK CAA CAP740 - UK Airspace Management Policy

subject to audit and oversight activity, to ensure that the appropriate processes and procedures exist, to meet the requirements of UK Reg (EU) No 551/2004 (The UK Airspace Regulation) and UK Reg (EU) No 2150/2005 (The UK Flexible Use of Airspace Regulation). Further guidance is contained in Chapter 9 of CAP 740, UK Airspace Management Policy.

2.123 The UK CAA has commenced a rolling programme of Special Use Airspace Authority audits, completing those of Defence Airspace Air Traffic Management (Headquarters Navy) and Defence Airspace Air Traffic Management (Headquarters Defence Infrastructure Organisation) in 2024. No non-compliance findings were identified at either audit, and the four minor observations at Defence Airspace Air Traffic Management (HQ Navy) audit were immediately and satisfactorily addressed.

2.124 The UK CAA has established a post (UK CAA secondee) within the Network Management operation at EUROCONTROL which should come into effect in Q1 2025. This post is designed to help facilitate the integration of new users (primarily space launches) into the European network, minimise the impacts to other airspace users, and aid international agreement and collaboration.

Flexible Use of Airspace - Strategy

2.125 Work continues to draft an updated Airspace Management Strategy that takes account of Ministry of Defence and NATS (En Route) plc recommendations generated from the investigations into Danger Area penetrations.

2.126 Effective Airspace Management and second-party assurance of Special Use Airspace delivers more efficient operations for all airspace users, enabling the Ministry of Defence to operate flexibly while minimising the impact on commercial air traffic and other airspace users. It minimises delays, lowers costs and reduces impact to the environment.

2.127 Furthering Airspace Management and Flexible Use of Airspace will facilitate the safe and efficient introduction of new entrants into the existing UK airspace structure.

Level 3 Airspace Management

2.128 The Ministry of Defence will be enhancing the delivery of Level 3 Airspace Management (see paragraph 2.107) to include the real-time activation and deactivation of the Airspace Management Cell, which is managed by Special Use Airspace in accordance with Airspace Management Policy. This should further improve the efficiency of airspace utilisation and provide improved data fidelity. It will lay the foundations for future operational use of Level 3 Airspace Management procedures when technological developments enable their implementation.

2.129 NATS (En Route) plc and the Ministry of Defence are working collaboratively regarding Joint and Integrated tactical airspace management. This work includes the commencement of a trial to improve the update of Special Use Airspace activation/de-activation and refines the airspace handback process through the use of the Local and Regional Airspace Tool. The Airspace Management Cell are working with the UK CAA to ensure consistent application of Flight Planning Buffers within the Free Route and Air Traffic Service route environments.

2.130 Development of UK industries in space and high-altitude operations is clearly in the national interest; however, to facilitate longer-term transition to commercial operations, airspace sharing and integration with current airspace users is required. This cannot be achieved without prioritisation agreements developed at a national level.

2.131 Activation of Special Use Airspace causes potential en-route delay to commercial air traffic. The State air navigation service provider can be financially penalised by EUROCONTROL Network Manager for this delay. Activation of large portions of Special Use Airspace for commercial space operations could cause large financial disbenefit to the State air navigation service provider. A means of compensating for this in the short term and a national agreement on how this is funded in the long term is needed.

2.132 Currently, Special Use Airspace is subject to collaborative decision making between the civil and military airspace managers to create a daily airspace use plan. This is formed by a joint and integrated approach to Airspace Management. Currently commercial entities are not represented within the joint and integrated structure or therefore within the Airspace Management Cell. Without national priorities which include space and high-altitude operations, conflicting requests for airspace are difficult to manage without the UK CAA arbitrating. While achievable in the short term this is not a tenable long-term solution, and incorporation into the joint and integrated approach is required. Likewise, Special Use Airspace is currently managed by the military as they are the primary operators. No agreement or mechanism is currently in place to facilitate the military management of commercial Special Use Airspace.

2.133 To facilitate launches from UK spaceports there is a requirement for cross-border Special Use Airspace and Airspace Management procedures and protocols. Liaison with Iceland, Norway and Canada to establish this for launches from SaxaVord Spaceport in 2025 is proving challenging. This and the associated lead-in time to safely establish the airspace and procedures places these launches at significant risk on current timelines.

2.134 The sharing of data is vital to fully realise the benefits of Airspace Management. Data transfer between operational systems must be assured to enable operators to make safety-related decisions.

2.135 Realisation of the full benefits of effective Airspace Management is dependent on access to assured real-time airspace data to enable operators to make safety-related decisions. This relies on an assured data-sharing network of systems, operated and supported by personnel trained to input accurate data and understand how the output can be safely utilised to maximum benefit. As such, engagement with a vast range of stakeholders with varying levels of experience in this element is vital to ensure a collaborative streamlined approach to Airspace Management.

Deployment of a Simplified Flight Information and Lower Airspace Service Deployments

Deployment Concept for Delivery of Improved UK Alignment with Internation Civil Aviation Organization Flight Information Service Provisions

BACKGROUND

2.136 UK Flight Information Services are based upon International Civil Aviation Organization's provisions on the flight information service and the requirements detailed within the Standardised European Rules of the Air. We intend to improve our alignment with the International Civil Aviation Organization, adopting the type of service provision arrangements seen elsewhere in the world (i.e., provision of a state-wide flight information service including surveillance-based traffic information and traffic avoidance advice and alerting service). The core deliverable of this project will be the publication of policy. The implementation of the policy will require an appropriate transition period to be determined in due course, but not before at least the public consultation on policy proposals has been conducted.

TARGET DATE

2.137 Q1 2027

PROGRESS

2.138 Delivery of the project was commenced in 2024, with technical solutions workshops completed in October. An initial technical options paper was presented at the UK CAA Air Navigation Control Board, with recommendations being accepted and external stakeholder engagement planned for 2025.

2.139 Despite progress made in 2024, the forecast target delivery date is now estimated as Q1 2029, given the complexities of programme management and decision-making across all dependent policy development areas of Electronic Conspicuity, Unmanned Traffic Management Service Provision, Lower Airspace Service, System Wide Information Management, Detect and Avoid and Communications Navigation Surveillance & Spectrum.

Deployment of a Digitised Lower Airspace Service

BACKGROUND

2.140 The integration of existing and new users in UK airspace is fundamental to modernisation to ensure all operators can be safely accommodated in the limited airspace volumes available; the most pressing volume is the lower airspace with rapidly increasing demand. A consistent and resourced UK Lower Airspace Service delivering air traffic services supported by digital data and Electronic Conspicuity data will create a safer operating environment for airspace users. The deployment of Lower Airspace Service will follow the International Civil Aviation Organization Aviation System Block Upgrades (ASBU), for which an aligned path is set out in the Airspace Modernisation Strategy Part 2[20]. The project to deploy Lower Airspace Service is currently being scoped with many key activities to follow, such as a concept of operations and possible funding models. Project scoping, including milestones and associated timelines, is currently underway.

TARGET DATE

2.141 2030+

PROGRESS

2.142 In Q1 2024, the Lower Airspace Service project scoping phase was initiated, including the development of a detailed project plan and a stakeholder engagement strategy. In Q2, work began on the Concept of Operations, involving collaboration with industry stakeholders to define service requirements and operational procedures. Additionally, Q3 focused on a public consultation regarding the proposed Concept of Operations and potential funding models.

Enable the Use of Enhanced Functions of a Flight Information Display by Flight Information Service Officers

BACKGROUND

2.143 International Civil Aviation Organization Doc 4444 Procedures for Air Navigation Services – Air Traffic Management (PANS-ATM) describes the functions of air traffic services surveillance systems in the flight information service and, in relation to Aerodrome Flight Information Service, the UK CAA considers these to be “enhanced functions”. At present, the technical specification developed by the UK CAA for the Flight Information Display supports only the use of Air Traffic Service surveillance systems to provide basic functions. The performance of enhanced functions is dependent upon wider developments including, inter alia: more widespread use of Automatic Dependent Surveillance–Broadcast technology, development of UK CAA proposals on Flight Information Service Officer training, qualification and licensing etc and would be considered to be an

[20] CAP 1711a: Airspace Modernisation Strategy 2023–2040 Part 2 - Delivery Elements

Air Traffic Service surveillance service. The UK CAA will develop requirements relating to the enhanced functions as operational requirements mature and are identified by industry.

TARGET DATE

2.144 Q1 2027

PROGRESS

2.145 Despite progress made in 2024, the forecast delivery date is now estimated for Q2 2028, given the complexities of programme management and decision-making across all dependent policy development areas of Electronic Conspicuity, Unmanned Traffic Management Service Provider, Lower Airspace Service, System Wide Information Management, Detect and Avoid and Communication Navigation Surveillance & Spectrum.

Element 6: Data Services

- **Outcome status is AMBER**
- **Overall Progress status is RED**
- **Timeliness status is RED**
- **Delivery Lead / Target Date: UK CAA (Q4 2028)**

SWIM Policy Development & Implementation:

- Develop UK SWIM Implementation Framework
- Implement a National UK SWIM Infrastructure

Deployment of System Wide Information Management Framework

Develop UK System Wide Information Management Implementation Framework

BACKGROUND

2.146 System Wide Information Management is a framework designed to facilitate the exchange of aeronautical information among all aviation stakeholders, including air navigation service providers, airlines, airports and pilots. System Wide Information Management aims to enhance safety, efficiency and environmental sustainability in air traffic management by ensuring that accurate and timely information is accessible to those who need it.

TARGET DATE

2.147 Q4 2024

PROGRESS

2.148 The workstream to develop a UK System Wide Information Management implementation framework is currently under review. The programme approach framework was presented to the UK CAA ExCo Airspace Board in March 2024. A System Wide Information Management Delivery Lead has been recruited to support this activity. The Workstream Lead role commenced late September 2024. Due to the complexity of the topic and global interoperability vision of the System Wide Information? Management concept, a need to ensure internal and external alignment of understanding is key. Research has indicated a global misunderstanding of the System Wide Information Management concept; this is hindering its delivery into the aviation system. The baseline date of Q4 2024 has not been achieved and will be adjusted following the completion of the framework review.

Implement a National UK System Wide Information Management Infrastructure

BACKGROUND

2.149 The System Wide Information Management project is currently undergoing a comprehensive review in relation to the impact of current regulations and the future vision for System Wide Information Management, with a focus on enabling an integrated airspace.

TARGET DATE

2.150 Q4 2025

PROGRESS

2.151 The data exchange for the UK is yet to be decided by the UK CAA and therefore will most likely not be compliant with the regulatory implementation date of 31 December 2025 as set out in Assimilated Regulation (EU) 716/2014 (the Pilot Common Project). At this stage the UK CAA is currently reviewing the extant legislation alongside the technical descriptors. Due to the delays in onboarding and complexity of the workstream it is unlikely this milestone will be met.

Element 7: Future Surveillance & Spectrum

- **Outcome status is AMBER**
- **Overall status is AMBER**
- **Timeliness status is GREEN**
- **Delivery Lead / Target Date: UK CAA (Q1 2030)**

- ASUR-B2/1 Evolution of ADS-B and Mode S
- ASUR-B2/2 Electronic Conspicuity-based surveillance system for airborne

aircraft (low and higher airspace) EVLOS, BVLOS surveillance Urban Air Mobility requirements HAPS surveillance requirements

- ✈ UK ASUR-B2/2 Establish use of EC & MLAT data in the provision of ATS separation services
- ✈ ASUR-B3/1 New non-cooperative surveillance system for airborne aircraft (medium altitude)
- ✈ ASUR-B4/1 Further evolution of ADS-B and MLAT
- ✈ UK ASUR-B2/1 Integration of EC sources to provide a comprehensive surveillance source with integrity and accuracy

2.152 Delivery Element 7, Future Surveillance and Spectrum, focuses on transitioning from traditional, non-cooperative surveillance to more cost-effective and secure solutions, reducing reliance on extensive ground-based infrastructure. Emphasis will be placed on spectrum security to prevent interference while enabling a more efficient surveillance footprint. This will be achieved through the wider use of cooperative surveillance, including low-cost solutions for accurate airspace monitoring, enhanced spectrum management to mitigate cyber and Global Navigation Satellite Service interference, and increased use of data link services to transmit time-critical aeronautical information.

2.153 The timeliness status of this element is driven by progress against Airspace Modernisation Strategy Part 3 milestones. The outcome status is driven by the maturity of these areas of work and absence of detailed delivery plans.

Future Surveillance Infrastructure

Communication Navigation Surveillance Infrastructure Development

BACKGROUND

2.154 The aim of this project is to provide a resilient Global Navigation Satellite System Navigation capability fit for aviation purposes in the UK including positional corrections from applicable augmentation systems.

TARGET DATE

2.155 Q1 2030

PROGRESS

2.156 A Minimal Operational Network working group was established in 2024 and tasked to develop a UK strategy. Detailed plans and engagement are currently in progress.

2.157 Communication Navigation Surveillance Infrastructure Development Navigation Terms of Reference have been shared with key stakeholders and the UK CAA is awaiting feedback.

2.158 A Communication Navigation Surveillance Infrastructure Development Communications project is set to begin in November 2026, pending development of International Civil Aviation Organization Standards and Recommended Practices.

2.159 Communication Navigation Surveillance Infrastructure Development Surveillance work has not started.

Policy Decision and Ofcom Endorsement for Allocation of 978MHz to Provide Additional Automatic Dependent Surveillance Broadcast Capacity

BACKGROUND

2.160 To progress the adoption of 978MHz (airborne) and execute work to support rollout, the spectrum allocation needs to be secured. The UK CAA is working with Ofcom to enact changes to associated spectrum management rules and licensing frameworks. There are also several workstreams underway with a specialist contractor to deconflict with existing services; these include Joint Tactical Information Delivery System, Distance Measuring Equipment and Programme Making and Special Events.

2.161 978MHz allocation will support additional airborne Automatic Dependent Surveillance Broadcast capacity but may also provide a Flight Information Service Broadcast or Traffic Information Service Broadcast provision. Currently ground infrastructure requirements are being investigated internally, and the delivery of such services will be dependent on the technical approach agreed.

TARGET DATE

2.162 Q1 2025

PROGRESS

2.163 In 2024, the UK CAA, in collaboration with Ofcom, advanced efforts to allocate the 978MHz frequency band to enhance Automatic Dependent Surveillance Broadcast capacity, particularly for unmanned aircraft systems. Achieving the policy decision by the expected date of Q1 2025 is on track.

Establish Common Infrastructure Requirements for the Provision of Lower Airspace Service

BACKGROUND

2.164 The project's aim is to establish the ground-based infrastructure requirements to provide an International Civil Aviation Organization Flight Information Service. It is likely to focus on traditional Communication, Navigation and Surveillance requirements, in parallel with Electronic Conspicuity, and utilisation of 978MHz for the provision of Automatic Dependent Surveillance Broadcast and Traffic

Information Service/Flight Information Service Broadcast. A review of the current CAP 670: Air Traffic Services Safety Requirements[21] under supplementary amendment 2021/02 also needs to be conducted. This work will be dependent on progress of the Lower Airspace Service concept.

TARGET DATE

2.165 2030+

PROGRESS

2.166 In 2024, the UK CAA outlined key milestones for developing the infrastructure requirements to support a Lower Airspace Service. In Q1 2024, a review of CAP 670 focused on Supplementary Amendment 2021/02 to assess existing Communications, Navigation and Surveillance requirements and identify necessary updates for Electronic Conspicuity and 978MHz Automatic Dependency Surveillance Broadcast/Traffic Information Service Broadcast integration.

2.167 By Q2, the UK CAA defined ground-based infrastructure specifications to align with International Civil Aviation Organization Flight Information Services, ensuring compatibility between traditional systems and emerging technologies.

2.168 In Q3, a stakeholder consultation process gathered industry feedback on the proposed infrastructure, involving the distribution of consultation documents and engagement through workshops.

2.169 In Q4, the UK CAA incorporated stakeholder input into the final CAP 670 updates and developed an implementation roadmap for deploying Lower Airspace Service infrastructure across the UK.

Element 8: Integration of Communications, Navigation, & Surveillance

- **Outcome status is AMBER**
- **Overall Progress status is AMBER**
- **Timeliness status is GREEN**
- **Delivery Lead / Target Date: UK CAA (Q1 2036)**

- NAVS-B0/1 Ground Based Augmentation Systems (GBAS)
- NAVS-B2/1 Dual Frequency Multi Constellation (DF MC) GBAS
- NAVS-B0/2 Satellite Based Augmentation Systems (SBAS)
- NAVS-B2/2 Dual Frequency Multi Constellation (DF MC) SBAS
- NAVS UK/2 SBAS solution implementation for the UK
- NAVS-B0/3 Aircraft Based Augmentation Systems (ABAS)
- NAVS-B2/3 Dual Frequency Multi Constellation (DF MC) ABAS

[21] CAP 670: Air Traffic Services Safety Requirements

2.170 Delivery Element 8, Integration of Communications, Navigation, Surveillance (CNS) and Spectrum, focuses on the implementation of new and integrated Communications, Navigation and Surveillance technologies while ensuring the secure and efficient use of available spectrum. This is enabled through the modernisation of Communications, Navigation and Surveillance infrastructure to support increased use of space-based technologies, the development of alternative technologies within core ground-based systems, and the introduction of a UK space-based augmentation system.

2.171 The timeliness status of this element is driven by progress against the Airspace Modernisation Strategy Part 3 milestones. The outcome status is driven by the maturity of these areas of work and absence of detailed delivery plans.

Future Navigation Infrastructure

Updated Rationalisation Programme for Existing Ground Infrastructure to Provide Global Navigation Satellite System Failure Resilience to Suitably Equipped Aircraft (Development of Minimal Operating Networks)

BACKGROUND

2.172 The Global Navigation Satellite System resilience provision needs to be aligned with the Performance Based Navigation mandate. A complementary Positioning, Navigation and Timing Minimal Operating Network is required to protect against failure or degradation of satellite-based navigation systems. To achieve this the only current alternative for crewed aviation is a terrestrial navigation provision such as Distance Measuring Equipment–Distance Measuring Equipment.

TARGET DATE

2.173 Q4 2025

PROGRESS

2.174 A Minimal Operational Network working group was established in 2024 and tasked to develop a UK strategy. Detailed plans and engagement are currently in progress.

2.175 Communications, Navigation and Surveillance Infrastructure Development Navigation Terms of Reference have been shared with key stakeholders and the UK CAA is awaiting feedback.

2.176 At this stage the milestone is on track to be delivered by the target date.

Provide Input into UK Space Agency Outline Business Case for a UK Satellite-Based Augmentation System

BACKGROUND

2.177 The project aims to identify and articulate the requirement for a Satellite-Based Augmentation System capability for the UK and contribute to the UK Government business case. That is, to establish timescales for project and develop plans for approval of service if required. As part of the project, the UK CAA will support efforts within government to explore options to remedy the current absence of a Satellite-Based Augmentation System Safety of Life in the UK and will support the UK Satellite-Based Augmentation System test-bed programme, aiding in development of the UK overarching business case requirements.

TARGET DATE

2.178 Q1 2025

PROGRESS

2.179 The UK Space Agency has conducted initial development of a business case for a UK Satellite-Based Augmentation System capability. The UK CAA has provided input to the UK Space Agency to inform their understanding of the implications of a UK Satellite-Based Augmentation System on air navigation service providers' infrastructure investment strategies and the potential safety implications.

2.180 The government direction for satellite-based navigation capability is to be decided. This could generate additional work under the Airspace Modernisation Strategy as a solution.

Develop a UK Framework for Dual-Frequency Multi-Constellation Satellite-Based Augmentation System

BACKGROUND

2.181 This project aims to influence the development of international standards and to develop the UK framework for implementation of Dual-Frequency Multi-Constellation Satellite-Based Augmentation System.

TARGET DATE

2.182 2030+

PROGRESS

2.183 In 2024, the UK CAA introduced the Aviation Safety (Amendment) Regulations 2024, which updated assimilated EU law in the field of aviation safety and made changes to the Air Navigation Order 2016. These amendments are part of the UK CAA's ongoing efforts to modernise airspace design and navigation services in the UK.

2.184 The UK CAA has established guidelines for Satellite-Based Augmentation System channel assignments to ensure compatibility and prevent interference with other systems.

Spectrum for Remotely Piloted Aircraft Systems Command and Control Link

2.185 The spectrum requirements of Remotely Piloted Aircraft Systems Command and Control Link need to be considered against the current and future spectrum landscape. The usage of the 5GHz band and suitable frequency management techniques were discussed at the July 2024 International Civil Aviation Organization Frequency Spectrum Management Panel. Work is ongoing looking at different technologies and frequencies for differing operator applications. The use of the 5GHz band is expected to be critical but confirmation of this is not expected until 2026.

Future Navigation Infrastructure Deployments

Updated Rationalisation Programme for Existing Ground Infrastructure to Provide Global Navigation Satellite System Failure Resilience to Suitably Equipped Aircraft (Development of Minimal Operating Networks)

BACKGROUND

2.186 The Global Navigation Satellite System resilience provision needs to be aligned with the Performance Based Navigation mandate. A complementary Position, Navigation and Timing Minimum Operating Network is required to protect against failure or degradation of satellite-based navigation systems. To achieve this the only current alternative for crewed aviation is a terrestrial navigation provision such as Distance Measuring Equipment–Distance Measuring Equipment. Currently there is no policy regarding Global Navigation Satellite System resilience, and this would need to be developed, possibly alongside a Global Navigation Satellite System reversion plan for the UK. The expectation of Global Navigation Satellite System performance and resilience could impact multiple areas of the Airspace Modernisation Strategy, including Advanced Air Mobility and Remotely Piloted Aircraft System integration.

2.187 Currently the core terrestrial navigation provision is Distance Measuring Equipment–Distance Measuring Equipment and further down the line (2030+) this could incorporate some elements of L-band Digital Aeronautical Communications System, which may have a terrestrial navigation component. Under various workstreams, the UK CAA will consider the Navigation and Surveillance Position as well as the Navigation and Timing requirements for new airspace users. This is likely to include contributions to UK Government work on complementary Position, Navigation and Timing systems through the DfT Position, Navigation and Timing office.

TARGET DATE

2.188 Q4 2025

PROGRESS

2.189 The full scope of the Ground Infrastructure for Lower Airspace project is greater than originally anticipated. The initial focus was around enabling Flight Information Service Broadcast and Traffic Information Service Broadcast. Technical requirements are now being drafted to determine the level of performance required to support Electronic Conspicuity, Unmanned Traffic Control, Detect and Avoid, Command and Control Link, Flight Information Service Broadcast and Traffic Information Service Broadcast. These requirements will be used to develop an initial Concept of Operations which will be tested through ongoing trials and sandbox activity.

Element 9: Aircraft Capabilities

- **Outcome status is AMBER**
- **Overall Progress status is AMBER**
- **Timeliness status is GREEN**
- **Delivery Lead / Target Date: UK CAA (Q1 2031)**

2.190 Element 9 focuses on identifying and implementing aircraft capabilities required for UK modernised airspace that are not addressed through other elements. It also supports the integration of new aircraft types and operations within UK airspace.

Higher Airspace Platform Systems

BACKGROUND

2.191 The UK Higher Airspace Platform Systems Delivery Group originally set up within the UK CAA governance structure to progress delivery of this sub-element was renamed the Higher Airspace Operations Delivery Group, to better reflect the evolving subject and the various use cases that are expected. The group is formed of UK CAA, Ministry of Defence, NATS (En Route) plc and DfT. A gap analysis has been completed to identify the overarching technical components needed to enable Higher Airspace Operations in the UK in the short, medium, and longer terms. This will inform further planned work for the UK CAA to develop requirements and policy, including Air Traffic Management/Air Navigation Service technical requirements.

TARGET DATE

2.192 Q1 2031

PROGRESS

2.193 In 2024 UK CAA engaged with industry and provided inputs to the European Concept for Higher Airspace Operations (ECHO) project. At the International Civil Aviation Organization 14th Air Navigation Conference, the UK CAA presented a paper on Air Navigation Priorities for Safe and Efficient Integration of Higher Airspace Operations and the Transit of Space Operations, on behalf of European States and EUROCONTROL, to further the international discussion and build consensus. The UK CAA will second a National Expert to cover this area in the EUROCONTROL Network Manager from 2025 to enhance pan-European collaboration and contributions.

Faster than Sound Flight

BACKGROUND

2.194 The existing Rules of the Air Regulations (UK Reg (EU) No 923/2012) permit, by omission, instrument flight rules flights to be undertaken at supersonic and hypersonic speeds over land, and the environmental implications on the ground (due to the effects of sonic booms) of such flights are potentially significant.

2.195 Post Concorde, there have been no commercial aircraft capable of hypersonic or supersonic flight; this has resulted in policy in this area not being reviewed due to a lack of requirement. However, with several manufacturers now actively working on the development of new commercial aircraft types that will be capable of supersonic and hypersonic speeds, with a stated desire to commence flights in mid to late 2020s, a review of policy is now necessary.

TARGET DATE

2.196 Q1 2031

PROGRESS

2.197 A UK rulemaking task is in progress, with the consultation on the Prohibition of Supersonic, Transonic and Hypersonic Flight over land concluded in Q1 2024. Consultation response was published in Spring 2025[22].

2.198 The UK CAA will develop provisions and an approval process to manage supersonic and transonic flight over land. UK CAA work on Higher Airspace includes the development of these types of operations and features in the work of European Concept of Higher Airspace Operations (ECHO 2) Project[23].

[22] Prohibition of Supersonic, Transonic and Hypersonic Flight over land - Civil Aviation Authority - Citizen Space
[23] About ECHO 2 Project - European Higher Airspace

3 Progress Overview 2024 – Industry Delivery

3.0 This chapter presents an update on the 2024 progress made by the industry under the relevant elements of the Airspace Modernisation Strategy, in accordance with their published delivery plans, as referenced under CAP 1711b. These elements are categorised into two key areas: Aircraft-Based Navigation and Airspace Management.

3.1 The summary of each element explains the progress made throughout the year, with a status rating of red, amber or green, based on the current published baseline as defined in the Enhanced RAG Assessment Framework and Performance section, located in the Introduction of this report. The introduction outlines a more detailed explanation for the 2024 assessment methodology, applying more stringent thresholds to shift the focus from strategic oversight to operational planning and delivery.

Element 1: Trajectory-based Operations

- **Outcome Status is AMBER**
- **Overall Progress Status is RED**
- **Timeliness Status is RED**
- **Delivery Lead /Target Date: NATS (En Route) plc (Q3 2028)**

3.2 Delivery Element 1, Trajectory-based Operations, focuses on allowing airspace operators to plan their activities based on their specific needs. This is made possible by: organised performance-based navigation routes at lower altitudes, adaptable airspace designs that facilitate low-level integration of various users, elimination of high-altitude route systems, and flexible airspace management methods that separate operations when needed, like military activities, training and space launches, along with air traffic management support tools.

3.3 The timeliness status of this element is driven by currently unknown level of delay to NATS (En Route) plc's Free Route Airspace deployment milestones based on the NR23 Service and Investment Plan. The outcome status for this element is amber due to the unknown impact of these delays to future milestones and the dependency on iTEC Version 2, the new flight data processing system to support en-route upper airspace operations across the UK. The target date is determined by the dynamic portfolio of NATS (En Route) plc, specifically regarding Free

Route Airspace, as outlined in their Service and Investment Plan 23[24], with a baseline set for Q3 2028.

Free Route Airspace

BACKGROUND

3.4 The initial aim of Free Route Airspace Deployments is to remove Upper Air Traffic Service Routes above 25,000 feet, allowing airspace users the freedom to flight plan the trajectory they want to between a defined entry and exit point, considering factors such as airspace availability, weather and wind speed. To date this has been achieved over the majority of Scottish upper airspace and over Wales and the Southwest in the London region. The long-term aim is to deploy Free Route Airspace operations across the whole of London and Scottish upper airspace operations and eventually lower airspace below 25,000 feet where possible. Historically, the UK Air Traffic Service route network has offered a constrained flight planning environment which is not always optimised for fuel efficiency.

TARGET DATE

Q3 2028

PROGRESS

3.5 The design and validation activities for Free Route Airspace Deployment 3, covering the remaining element of Scottish Control upper airspace, completed in Q2 and Q4 2024 respectively at Prestwick Centre. NATS (En Route) plc are evaluating their Long-Term Investment Plan to determine feasible development and implementation windows, while awaiting the results of the replanning efforts for Stream 1 Deployment Point En Route Transformation Programme which will deploy iTEC Version 2 into Prestwick Upper Airspace.

3.6 Deployment of iTEC Version 2, the new flight data processing system to support en-route upper airspace operations across the UK, is an enabler for Trajectory-based Operations across UK airspace and will enable the deployment of future cross-border free route airspace initiatives. NATS (En Route) plc will be able to fully realise the benefits of full cross-border Free Route Airspace operations once it has deployed iTEC Version 3, also referred to as iTEC SkyNex. Until that implementation is complete, Route Availability Document restrictions will remain in effect in these regions.

3.7 The UK CAA continues monitoring and managing the risk through regular oversight of NATS (En Route) plc's programme delivery and awaits confirmation on the outcomes of their replanning activity in the early months of 2025.

[24] NATS (En Route) plc publishes its Service and Investment Plan (SIP) through its NATS customer gateway website (a login is required).

Element 2: Terminal Airspace Re-design

- **Outcome Status is RED**
- **Overall Progress Status is RED**
- **Timeliness Status is RED**
- **Delivery Lead / Target Date:**

Masterplan Airspace Change Proposals:

Airspace Change Organising Group (Q1 2029)

Non-Masterplan Airspace Change Proposals:

- GANP APTA Improve arrival and departure operations

UK Aerodromes (Q1 2030)

Airspace Change Masterplan

BACKGROUND

3.8 Element 2, Terminal Airspace Redesign focuses on managing arrival and departure operations at individual airports, providing predictable and repeatable routes that connect airports to the Free Route Airspace environment. This structured approach helps define the need for controlled airspace while enabling modern aircraft to achieve sustainable emissions reductions through optimised climb and descent performance. This is enabled through structured performance-based navigation routes at lower levels, flexible access airspace structures for low-level integration, Electronic Conspicuity for accurate navigation data sharing, and airport management of runway sequencing, linking airport operations with the wider network through the Airport Operations Plan.

3.9 2024 saw the programme balancing numerous operational, financial and regulatory challenges with some progress across the clusters. Delays were primarily driven by funding constraints, regulatory complexities and evolving stakeholder requirements, affecting the overall programme status, which remains a Red RAG status overall.

3.10 The timeliness status of this element is driven by delays to the milestones in the latest accepted iteration of the Masterplan[25]. The outcome status is reflective of the level of risk in this area and confidence in the current timelines.

North of England Cluster

TARGET DATE

3.11 Q1 2026

[25] UK Airspace Change Masterplan Iteration 2

PROGRESS

3.12 All sponsors within the cluster completed the design simulations by Q2 2024.

3.13 In Q2 2024 however, Leeds-Bradford did not progress through its CAP 1616 Stage 2 gateway. Discussions were held between the UK CAA and Leeds-Bradford with the airport sponsor requesting a new gateway to be scheduled for February 2025.

3.14 In Q3 2024, the notification from the UK CAA that Doncaster-Sheffield airport was planning to reopen meant that stakeholders in the North of England cluster had to begin considering the impacts of its reopening.

3.15 During the same period, Manchester and East Midlands reflected on the results of the simulations and the need to refine their instrument flight procedure designs, resulting in a delay to their full options appraisal stage.

3.16 In October the DfT wrote officially to Liverpool airport requesting progress is made with their instrument flight procedure design activity, after the airport sponsor paused work over the summer, citing funding difficulties.

3.17 As a result of the delays in the cluster, the Public Engagement Exercise was paused, with a revised date yet to be confirmed.

Southeast Cluster

TARGET DATE

3.18 Q1 2029

PROGRESS

3.19 As of Q1 2024, four airspace change proposals in the cluster had yet to progress through Stage 2. These were London Heathrow, Southend, Bournemouth and Farnborough. Meanwhile, sponsors continued to refine their low-level altitude airspace design options in preparation for the integration stage.

3.20 In Q2 2024, a Cumulative Assessment Framework review of sponsor interdependencies at lower altitudes was conducted by ACOG. This activity was also supported by the collation of the airport airspace change proposals options data in the ACOG ‘s version of a VOLANS 3D visual design tool, in collaboration with NATS (En Route) plc, to visualise the system-wide designs, identify interdependencies, conflicts, trade-offs and identify solutions.

3.21 Discussions between the airports and ACOG continued as to early deployment options and splitting up the cluster due to its large size and complexity. This was in response to a request by the Co-sponsors for ACOG to consider other than Gatwick early deployment options for the cluster. Q2 2024 saw the second early deployment workshop held by ACOG to assess potential options with outcomes yet to be defined.

3.22 By Q4 2024, all airports in the cluster had progressed through Stage 2, apart from Bournemouth.

Gatwick

3.23 In Q1 2024, a CAP 1616 gateway swap between Gatwick and the North of England cluster took place, due to some airports slowing down because of funding and design issues. This meant the Stage 3 gateway for Gatwick was brought forward to January 2025.

3.24 ACOG's Public Engagement Exercise started in February 2024, which concluded in March, with the publication of responses on the ACOG's website[26].

3.25 Gatwick continued to make progress with NATS (En Route) plc holding simulations and engagements and ACOG made a submission of Gatwick's iteration 3 Masterplan to the UK CAA in Q2 2024. However, due to issues related to noise modelling, delays to the revised gateway submission and therefore decision-making on the submitted version of the Masterplan has been delayed, with plans yet to be confirmed.

Heathrow

3.26 The year began with meetings between ACOG and Heathrow to review the additional information supplied by the UK CAA to define the workplan for Heathrow's Stage 2 resubmission and application for an extraordinary gateway. Heathrow estimated a six-month delay to provide a detailed scope of works and timetable for their Stage 2 resubmission. This had impacts for the wider Southeast cluster meaning the start of the integration phase was delayed from April to October 2024. As a result of this change, ACOG commenced work on a plan of works for the rest of the cluster and early deployment options.

3.27 During this period, Heathrow's engagement with residents about aircraft noise began, and confirmation of Heathrow's Stage 2 develop and assess gateway date in Q2 2024.

3.28 Heathrow progressed through their Stage 2 develop and assess gateway in Q3 2024 and they made progress with Stage 3 work in collaboration with NATS (En Route) plc. In Q4 2024, Heathrow advised their Full Airport System Options would be available in Q3 2025.

Biggin Hill

3.29 In Q1 2024, Biggin Hill progressed through their Stage 2 gateway. Full options appraisal was completed in April 2024.

[26] ACOG Airspace Change Masterplan Iteration 3 London Airspace South Public Engagement Exercise Feb 2024.pdf

Bournemouth

3.30 A January 2024 Stage 2 gateway was delayed by the airspace change sponsor to December 2024. Following document submission, Bournemouth did not progress through the gateway with plans for their resubmission yet to be confirmed by the airport.

Farnborough

3.31 In Q1 2024, Farnborough's original Stage 2 gateway was moved to October 2024 at their request. In Q3 2024, Farnborough successfully progressed through Stage 2.

London City

3.32 At the start of the year, London City secured funding and a contractor for their Stage 3 gateway. Full options appraisal work was completed in March 2024.

Luton

3.33 By Q1 2024, Luton had completed their full airport system options and analysed noise metrics to narrow down the options.

RAF Northolt

3.34 Following progress through the Stage 2 gateway in 2022, the Ministry of Defence's airspace change proposal for RAF Northolt is currently on pause at Stage 3.

Southampton

3.35 By Q1 2024, Southampton had successfully completed their Stage 2 gateway and completed their full airport system options. They provided NATS (En Route) plc with their shortlisted options from Stage 2.

Southend

3.36 Southend's Stage 2 resubmission, following lack of progress in 2023, resulted in the sponsor progressing through the gateway in Q3 2024.

Stansted

3.37 In Q2 2024, Stansted refined their full airport system options.

Scottish Cluster

TARGET DATE

3.38 Q4 2025

PROGRESS

3.39 The Scottish cluster began 2024 with the commencement of their public engagement exercise which concluded in March. It received 12 responses: six from individuals and six from community groups/larger stakeholders and was well received overall. In Q3 2024, the results were published on ACOG's website[27].

3.40 The cluster saw the continuation of work on the full options appraisals, noise and CO_2 activities. Several flight option elements included novel and innovative approaches, untested in UK airspace. The complexity of these elements and the potential need for policy and legislative changes have, according to ACOG, the potential to delay progress. ACOG expressed concerns that these activities were taking longer than expected, when it became apparent that some of the proposed designs were unsuitable for Edinburgh and prompted revisions to the overall system-wide design, impacting the Stage 3 gateway dates, due to no contingency left in the programme.

3.41 The Scottish Masterplan iteration 3 was submitted to the UK CAA in Q2 2024. However, under the regulatory arrangements in place, both the Scottish cluster and London Airspace South (Gatwick) Masterplans could not be formally accepted until the clusters' airspace change proposals progress through the CAP1616[28] Stage 3 consult and engage gateways, which are yet to be confirmed.

West of England Cluster

TARGET DATE

3.42 Q1 2025

PROGRESS

3.43 In Q1 2024, the cluster resumed activities after pausing in 2023 due to funding and resourcing constraints at Cardiff and Exeter. During this period, only Bristol progressed to the Stage 3 gateway. Additionally, at the end of 2023, the Co-sponsors approved Cardiff's withdrawal from the programme.

3.44 NATS (En Route) plc work with Bristol had begun and made progress throughout the year. Q3 saw this work continue regarding design refinement and engagement, with a further workshop in October.

3.45 In Q3 2024, ACOG submitted an options paper for consideration by the Co-sponsors, containing advice on splitting the existing airspace change proposal into two, due to the lack of Exeter's progress; or potential removal of Exeter altogether from the cluster, suggesting this would enable Bristol and NATS (En

[27] ACOG ScTMA PEX_DOCUMENT_2024.pdf
[28] CAP 1616: The Process for Changing the Notified Airspace Design

Route) plc to progress. Decision regarding the advice is yet to be made by the Co-sponsors.

Non-Masterplan Airspace Change Proposals for Performance Based Navigation Implementation

Performance Based Navigation Implementation: Required Navigation Performance Approaches at Airports with Approach Control

BACKGROUND

3.46 Assimilated Regulation (EU)2018/1048 (The UK Performance Based Navigation Regulation) requires Required Navigation Performance Approach (three lines of minima) to be deployed at all runways with instrument runway ends, served by non-precision approach. Deadline for implementation was Q4 2020. This is currently not possible due to lack of a UK Satellite-Based Augmentation Systems solution. Identifying a UK Satellite-Based Augmentation Systems solution is an enabler to this workstream.

TARGET DATE

3.47 2030+

PROGRESS

3.48 The proposed regulation permits the deployment of area navigation (RNAV1) or Required Navigation Performance (RNP1) in terminal manoeuvring area operations based on an individual airport's own objectives and the local context. It is the responsibility of each airport to determine which navigation specification is best suited to support their operation.

Element 3 Network Management

- **Outcome Status is GREEN**
- **Overall Progress is AMBER**
- **Timeliness Status is RED**
- **Delivery Lead / Target Date: NATS (En Route) plc (Q2 2024)**

3.49 Delivery Element 3, Network Management, aims to balance the capacity of the operational network with the demand from users through the sharing of accurate plan information. This is enabled through accurate Airport Operations Plans informing the Network Operations Plan managed through the Network Manager. The changes are enabled through queue management concepts – arrival and departure management techniques that can utilise the runway capacity efficiently, while reducing the need for the airborne holding of aircraft.

3.50 The timeliness status of this element is driven by the withdrawal of Arrival Manager Headbranch; while this is a delay against the assessment criteria for timeliness, other milestones reported have been met. The outcome status is driven by NATS (En Route) plc mitigating resource risk for Time Based Separation deployments and meeting milestones reported in NATS (En Route) plc's NR23 Service and Investment Plan[29]. The NATS (En Route) plc dynamic portfolio projects the following timelines: the Arrival Manager Headbranch is estimated to be completed in Q1 2026, based on a baseline from SIP23 in Q3 2023. The Gatwick Time Based Separation Advanced Mixed Mode is anticipated to finish by Q1 2025, with a baseline from SIP23 in Q1 2024. Finally, the Heathrow Time Based Separation Pairwise is projected for completion in Q4 2024, with a baseline from SIP23 in Q2 2024.

Queue and Capacity Management

BACKGROUND

3.51 Queue and Capacity Management primary focus is on deployment of the two Time Based Separation projects at Heathrow and Gatwick airports, to provide an increased landing rate, enabling reduction in holding and carbon emissions.

TARGET DATE

3.52 Q2 2024

PROGRESS

3.53 A validation simulation for Heathrow Time Based Separation Pairwise was completed in April 2024 and the project was delivered in December 2024.

3.54 Validation Simulation two for Time Based Separation Advanced Mixed Mode at Gatwick completed in April 2024. NATS (En Route) plc has reported a deployment window of Q4 2024 to Q1 2025. Air Traffic Controllers started their training in December 2024 and integration testing will start in January 2025.

3.55 In April 2024 NATS (En Route) plc deployed Arrival Manager Headbranch to replace the current arrival management tool used by the Heathrow and Gatwick Approach operations in Terminal Control at Swanwick. NATS (En Route) plc faced technological issues after the deployment, which led to the decision of reverting back to the previous system to ensure the safety of ongoing operations.

3.56 NATS (En Route) plc is currently working with their supplier on resolving these issues and re-implementing a new tool while minimising any negative effects on Heathrow Pairwise and Gatwick Advanced Mixed Mode. Re-deployment plans

[29] NATS (En Route) plc publishes its Service and Investment Plan (SIP) through its NATS customer gateway website (a login is required).

will be confirmed once specialised resources from Pairwise and Gatwick Advanced Mixed Mode are available.

3.57 At Manchester airport, Time-Based Separation implementation, including procedures and training, is in the planning stages for Q4 2028.

Element 6: Data Services

- **Outcome status is AMBER**
- **Overall Progress status is RED**
- **Timeliness status is RED**
- **Delivery Lead / Target Date: NATS (En Route) plc (Q1 2027)**

3.58 Element 6, Data Services, is aimed at facilitating the secure, accurate and timely sharing of aviation data. Ensuring this information is available to the appropriate operational user in time to support optimised mission planning and execution is essential. This digitised aeronautical data will improve safety-critical decision making, enhance environmental impacts of flight profiles and assist new entrant integration with traditional airspace users. Consumed through both established systems and new market-developed tools, the data should flow seamlessly between operators and service providers nationally and across international boundaries.

3.59 The timeliness status of this element is driven by delays to the Airspace Modernisation Strategy Part 3 System Wide Information Management milestone due in 2024. The outcome status is driven by delays to future milestones in this area, alongside delays to NATS (En Route) plc's key enabling technological transformation programme.

Key Enabling Services – Deployment Point En Route

BACKGROUND

3.60 Deployment Point En Route is a NATS (En Route) plc programme to replace significant elements of the current, ageing technical infrastructure to bring greater consistency, flexibility and resilience to meet future airspace user capacity needs and enable efficiencies across the NATS (En Route) plc operation. The benefits of this programme will be realised progressively through further enabling activity as current tools are transitioned to these new systems. For example, it will enable the expansion of Free Route Airspace, including its utilisation cross-border when the National Airspace System Flight Data Processor is replaced. The programme was simplified in early 2022 to deliver outcomes through four "streams" which are running concurrently. The detail of each is set out below.

TARGET DATE

3.61 Q1 2027

PROGRESS

Stream 1

3.62 Prestwick Centre Upper Airspace Full Operational Service will deploy an updated Flight Data Processor (FDP) known as iTEC version 2 into that airspace. It will provide updated controller tools and be a precursor to the more complex deployments into Swanwick Area Control airspace. Formal validation was completed in June 2024, to test and confirm its readiness to safely deliver air traffic services using the system. This activity did not provide the required level of confidence and so Stream 1 activities were reviewed and the validation output analysed. NATS (En Route) plc are working on a recovery plan with an aim to complete this phase of work by the end of Q2 2025, instead of Q4 2024. A revised deployment plan for Stream 1 will be shared with airline customers and the CAA pending the outcome of the review.

Stream 2

3.63 Deployment of the new technological platform (Integrated DSESAR Services) has been delayed from Q4 2024 to Q3 2025 following a requirement for additional time from external managed service providers to complete transition planning. Stream 2 achieved its initial operation to its revised schedule in September 2024 in advance of the main milestone of Platform Ready for Use in Q3 2025. Stream 2 is a key enabler for the delivery of future tools as it brings the modernised infrastructure and networks into use.

Stream 4

3.64 Deployment of Main Voice System (MVS) at Swanwick Area Control Temporary Ops Room Service experienced a delay from Q1 to Q4 2027. Despite expressing confidence, the project has identified greater challenges with the integration of Main Voice System into the current operational system which are beyond the supplier's internal capability to resolve. This will require a greater use of NATS (En Route) plc's internal resource which will necessitate a lengthier deployment schedule to Q4 2027.

Doppler Very High Frequency Omni Directional Radio Range De-Commissioning

3.65 NATS (En Route) plc continues to make progress on the optimisation and rationalisation in the decommissioning of its en-route Doppler VHF Omni directional Range infrastructure, as part of its Doppler VHF Omnidirectional Range Rationalisation Programme.

3.66 In 2024 NATS (En Route) plc de-activated the Machrihanish (MAC) and Brecon (BCN) Doppler VHF Omnidirectional Ranges and the Whitegate (WHI) Non-Directional Beacon (NDB).

3.67 As part of the NATS (En Route) plc Sustainment and Surveillance Programme, replacement of the Tiree Doppler VHF Omnidirectional Range was completed in Q2 2024.

4 Progress Overview 2024 – Local Single Sky Implementation Plan

4.0 The UK is committed to reporting to EUROCONTROL through the Local Single Sky Implementation Process, which annually evaluates the goals in the EUROCONTROL Implementation Plan and Report.

4.1 The reporting mechanism provides a comprehensive overview of progress in implementing the Single European Sky package among the European Civil Aviation Conference member states. The reporting process achieves the output of monitoring the evolution of air traffic management within Europe.

4.2 This chapter contains references to this plan and details those overlapping initiatives between the UK and the European Union, which were not included in the CAA or industry delivery plans outlined and referenced in the 2024 version of the AMS Part 3.

Element 1: Trajectory-based Operations

- UK Rulemaking Task: Updating Performance-Based Navigation Regulations for Airspace Modernisation
- Compliance Strategy for Aircraft Identification and Flight Data Processing for Airspace Modernisation

4.3 The activities outlined below relate to the first delivery element, Trajectory-based operations, in alignment with the EUROCONTROL Implementation Plan and Report.

Aircraft Identification

4.4 NATS (En Route) plc maintains the National Airspace System, the UK's state-level flight data processing and planning system. However, NATS (En Route) plc is currently unable to utilise Mode-S surveillance data and is non-compliant with the mandate for Aircraft Identification. NATS (En Route) plc's route to full compliance is planned through the introduction of deploying iTEC into both Upper and Lower airspace; this will be achieved with the iTEC SkyNex product. Evaluation of alternative routes to compliance continues, through a Flight Data Processor resilience programme to replace the National Airspace System by 2030. The UK CAA is engaging with airport stakeholders to ensure that local

flight planning systems will be interoperable with the NATS (En Route) plc flight data processor system and are aligned once full compliance is achieved.

Element 2: Terminal Airspace Re-design

- Manchester Airport Safety Nets: Implementation & Radar System Upgrade
- Heathrow Airport & NATS Collaboration: Advancing Automated Surface Management for Tower Operations
- Continuous Descent Operations: Performance-Based Navigation Implementation Across UK Airports
- Continuous Climb Operations: Implementation Plans for Edinburgh & Bristol Airports
- Collaborative Flight Planning: Automation Integration in NATS (En Route) plc's Flight Data Processor Replacement Programme

4.5 The activities outlined below relate to the second delivery element, Terminal Airspace Re-design, in alignment with the EUROCONTROL Implementation Plan and Report.

Airport Safety Nets

4.6 No progress was made in 2024. Manchester airport plans to have airport safety nets operational by the end of 2025. The radar data processing system upgrade is scheduled to transition to the operational environment in Q1 2025, followed by its introduction into service.

Automated Assistance to Controllers for Surface Movement and Planning Routing

4.7 No progress was made in 2024. Heathrow airport and NATS (Services) Ltd (NSL) are partnering to develop an advanced surface management solution, to support automated assistance to air traffic controllers for surface movement and planning routing. This will transform the tower operation. Implementation is planned for Q4 2026.

Continuous Descent Operations

4.8 Continuous descent operations are in place at Manchester, Stansted, Luton, Heathrow and Glasgow airports. Manchester Airports Group are progressing an airspace change proposal for Manchester and East Midlands, to introduce Performance Based Navigation transitions from the primary holds onto the final approach track for the instrument landing system or non-directional beacon.

4.9 Luton airport plans to implement procedures enabled by Performance Based Navigation for implementation in Q3 2025.

4.10 Heathrow airport has looked at continuous descent approaches using Performance Based Navigation and options are being explored with implementation planned for Q4 2028.

4.11 NATS (Services) Ltd currently delivers continuous descent operations at Glasgow airport, noting that some limitations exist due to terrain.

Continuous Climb Operations

4.12 Edinburgh airport is working with airline partners to support implementation and performance for continuous climb operations. Edinburgh has proposed an airspace change with public consultation planned for 2025 and implementation planned for Q1 2028.

4.13 Improvement to continuous climb operations at Bristol airport is planned for implementation in 2029.

Element 3: Network Management

- Airport Collaborative Decision-Making: Deployment Plans & Time-Based Separation Implementation
- Gatwick Advanced Mixed Mode: Implementing Reduced Separation with Runway Occupancy Time Characterisation
- Heathrow Airport and NATS Collaboration: Validating and Deploying the Airport Operation Plan & Network Operations Plan

4.14 The activities outlined below relate to the third delivery element, Network Management, in alignment with the EUROCONTROL Implementation Plan and Report.

Airport Collaborative Decision Making

4.15 Local deployment of Airport Collaborative Decision Making is planned for deployment at Manchester and Stansted airports in 2025.

4.16 Gatwick airport is seeking to enable a switch to network mode in Q1 2025. A de-icing management tool system is in place at Gatwick airport in preparation for networked Airport Collaborative Decision Making. Further progress will follow implementation of procedures.

Reduced Separation Based on Local Runway Occupancy Time Characterisation

4.17 Reduced separation based on local Runway Occupancy Time Characterisation is part of Gatwick Advanced Mixed Mode delivery (see Chapter 3). Departures will

move to wake turbulence categorisation and separation minima to realise efficiencies.

Airport Operations Plan/Network Operations Plan

4.18 Heathrow airport has worked with NATS (En Route) plc throughout 2024 to complete validation activity to enable an initial Airport Operations Plan and Network Operations Plan. Validation activity will continue into early 2025, and if successful, deployment is expected in Q1 2025.

Element 6: Data Services

- Enhancing Situational Awareness: Electronic Terrain & Obstacle Data Implementation in the UK
- Expanding Cross Border Arrival Management: Extended Arrival Manager & System-Wide Information Management Service
- Common Flight Message Transfer Protocol: iTEC v2 Deployment Under NATS DP (En Route) plc Programme

4.19 The activities outlined below relate to the sixth delivery element, Data Services, which is in alignment with the EUROCONTROL Implementation Plan and Report.

Electronic Terrain and Obstacle Data

4.20 The availability of assured Electronic Terrain and Obstacle Data improves situational awareness of terrain and obstacle hazards, supporting separation assurance and the visualisation of approaches in difficult terrain environments.

4.21 The UK is working towards meeting the requirements for Terrain and Obstacle Data via an overarching Aeronautical Information Manual project plan which is planned for Q2 2025.

4.22 The Ministry of Defence provides Terrain and Obstacle Data to the UK CAA for inclusion in the wider national programme.

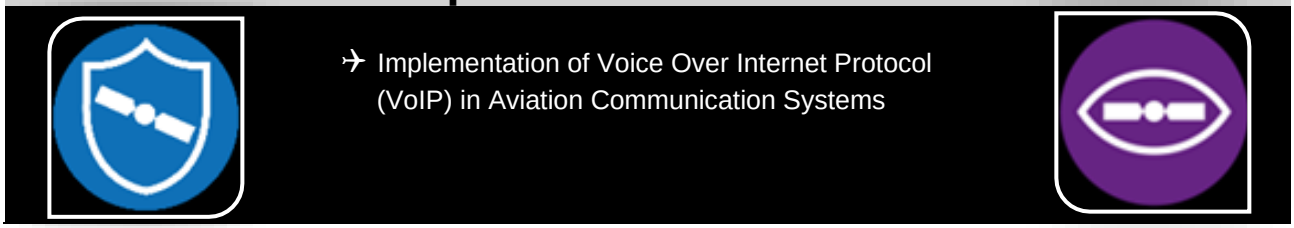
Flight Information Exchange (Yellow Profile) – Extended Arrival Manager System Wide Information Management Service

4.23 NATS (En Route) plc provide extended arrival manager data through the Cross Border Arrival Manager (XMAN) system which has been in operation since 2016. NATS (En Route) plc has utilised XMAN procedures to manage London Heathrow and Gatwick arrival streams to good effect, but the plan is to adopt similar procedures with neighbouring air navigation service providers for aircraft inbound to specified continental airports by the end of 2026.

Common Flight Message Transfer Protocol

4.24 The Ministry of Defence is awaiting the deployment of iTEC Version 2 to provide full Flight Message Transfer Protocol functionality. Deployment of iTEC Version 2 is part of the NATS (En Route) plc DP En Route programme, Stream 1 (see Chapter 3)

Element 7: Future Surveillance and Spectrum Element 8: Integration of Communications, Navigation, Surveillance and Spectrum



4.25 The activities outlined below relate to the seventh and eighth delivery elements, Future Surveillance and Spectrum, and Integration of Communications, Navigation, Surveillance and Spectrum, in line with the EUROCONTROL Implementation Plan and Report.

Voice over Internet Protocol in Airport/Terminal and En-Route

4.26 Projects are underway by NATS (En Route) plc to introduce Voice Over Internet Protocol capability to airports; safety assessments are being completed. Voice Communication Systems to support Voice over Internet Protocol links to ground radio stations is planned to be implemented into operational use by Q1 2027. The Main Voice System will support the Voice over Internet Protocol in en-route capability.

5 Co-sponsors' Update

Airspace Modernisation Co-sponsors

5.0 The DfT and the UK CAA are the Co-sponsors for airspace modernisation. The DfT is accountable for national policy on airspace and the UK CAA for the Airspace Modernisation Strategy. Together, the DfT and the UK CAA may commission specific projects necessary for airspace modernisation, including the delivery of the elements set out in Part 2 of the Airspace Modernisation Strategy. Such commissions will require delivery groups or an organisation leading a delivery group to develop a realistic, evidenced and financed plan. In some cases, delivery of elements is a matter of law or policy. For others, delivery depends on the voluntary participation of delivery groups, and confidence in delivery is dependent on the benefits the participating organisations perceive and the resources that they can commit.

5.1 In 2024, the Co-sponsors formal board met six times, to discuss and make decisions on:

- UK CAA Future of Flight governance alignment with Airspace Modernisation Strategy governance.
- Advice on the use of Air Traffic Management and Unmanned Aircraft powers.
- The status of airspace change proposals in the Airspace Modernisation programme.
- Priorities during the 2024 general election period.
- UK Airspace Design Service timelines and consultation.
- Element #1 – Trajectory-based operations
    i. The Co-sponsors discussed performance-based navigation and free route airspace deployment, which has been affected by delays in the delivery of the Deployment Point En Route programme and is expected to deploy in 2030.
- Element #2 – Terminal airspace redesign
    i. The Co-sponsors discussed progress with the airspace change masterplan clusters (Manchester, London, Scottish and West).
    ii. The Co-sponsors raised actions to re-work the cluster timelines based on available information including priorities for cluster deployment.

iii. The Co-sponsors agreed proposals for consultation on the UK Airspace Design Service, its funding and funding of airspace modernisation for airports outside its scope.

- Element #4 – Integration

  i. The Co-sponsors discussed the current status of Detect and Avoid, Electronic Conspicuity, ground infrastructure and unmanned aircraft systems traffic management. They also discussed Electronic Conspicuity aspects of a drone demonstration at the Federal Aviation Administration in Texas.

  ii. The Co-sponsors reached a decision to provide summary-level updates to the Future of Flight Programme Board on Airspace Modernisation activities, particularly regarding Integration.

- Element #6 – Data services

  i. The Co-sponsors discussed timeline changes to Deployment Point En Route Stream 1 and Stream 4. The impact of the timeline change of Deployment Point En Route Stream 1 will be known in Q1 2025, while Stream 4 is currently delayed to Q4 2027, leaving it with an amber rating due to now being six to 12 months behind schedule. They also discussed updates to System Wide Information Management, as a new lead was recruited in September 2024.

UK Airspace Design Service

5.2 In 2023, the Co-sponsors established a joint project team to identify and set out how a single entity, which for the purposes of this project is termed the UK Airspace Design Service, could deliver a modernised airspace design to achieve the level of ambition set by the UK CAA's Airspace Modernisation Strategy.

5.3 The project team considered the remit, scope, governance and funding model for the UKADS, whether the role should sit within a new or existing body, and the legislative framework, as well as other policy and regulatory considerations. For the project itself, the team put in place proportionate governance.

5.4 The proposed first phase is for UKADS to be tasked to NATS (En Route) plc and to prioritise modernisation of the complex airspace around London, i.e. the London cluster of the Airspace Change Masterplan, under Element 2, Terminal airspace re-design, of the Airspace Modernisation Strategy. Subject to UKADS capability and capacity, the DfT and UK CAA may expand this scope in the future. Ultimately UKADS could one day become the only body responsible for progressing changes to the design of UK airspace. The DfT and UK CAA are not planning to fundamentally change who manages the airspace or initiates

airspace changes – that will for the most part remain with airports and air traffic service providers, who know their local stakeholders' interests best.

5.5 Alongside our proposals for the UKADS, the DfT and UK CAA are proposing to reform the funding of airspace change proposals UK-wide by creating a new UK Airspace Design Charge. This would meet the efficient costs of NATS (En Route) plc to provide UKADS and also capitalise a new UK Airspace Design Support Fund to cover relevant costs of sponsors of eligible UK airport airspace change proposals that are outside the scope of UKADS.

5.6 Following extensive stakeholder engagement in 2023 and 2024, the DfT and UK CAA launched a joint consultation on these proposals in October 2024[30].

5.7 The DfT and CAA will publish a Consultation Response Document in 2025 providing greater detail on the consultation outcome.

UK Pilot Common Project (Commission Implementing Regulation (EU) No 716/2014)

5.8 Commission Implementing Regulation (EU) 716/2014 the Pilot Common Project was retained on the UK's departure from the EU and has been assimilated into UK Law. The Pilot Common Project regulation was a pilot initiative to implement air traffic management functionalities, based on Single European Sky Air Traffic Management Research solutions, in a coordinated and synchronised manner. The assimilated UK Pilot Common Project contains five of the original six air traffic management functionalities, with associated target implementation dates:

- Extended Arrival Management and Performance Based Navigation in the High-Density Terminal Manoeuvring Areas. Implementation date, 31 December 2027.
- Airport Integration and Throughput. Implementation date, 31 December 2029.
- Flexible Airspace Management and Free Route. Implementation date, 31 December 2028.
- Initial System Wide Information Management. Implementation date, 31 December 2025.
- Initial Trajectory Information Sharing. Implementation date, 31 December 2027.

5.9 The EU carried out a review of the Pilot Common Project and concluded that, while it achieved positive operational changes to European air traffic management, the variable level of maturity for implementation of Air Traffic Management Functionalities and its impact on the synchronisation of their

[30] CAP3029: Airspace modernisation: consultation on a UK Airspace Design Service

implementation reduced the effectiveness of the Pilot Common Project. Therefore, the EU closed the pilot phase of common projects and evolved the Pilot Common Project with an updated focus, based on the criteria of contributing to achieving essential operational changes of the European Air Traffic Management Masterplan, maturity, and the need for synchronised implementation. This resulted in the EU revoking the Pilot Common Project and establishing Commission Implementing Regulation (EU) 2021/116 (Common Project One (CP1)), published in 2021.

5.10 The UK's assimilated Pilot Common Project has not been amended to reflect the changes made within the EU, with the exception of amendments to Air Traffic Management Functionality implementation dates by UK Statutory Instrument 2022 No.211[31].

5.11 The Pilot Common Project is being reviewed to consider its relevance and suitability in the context of the UK withdrawal from the EU, the UK CAA Airspace Modernisation Strategy and the UK regulatory framework for air traffic management, including the UK's association to the Single European Sky Air Traffic Management Research Joint Undertaking in 2024.

5.12 The UK CAA is working with organisations named in the Pilot Common Project who are directly impacted; Heathrow, Gatwick, Manchester Airports Group and NATS (En Route) plc in order to determine a recommended course of action for the UK approach to the Pilot Common Project. The recommended course of action will aim to address:

- Interoperability risks created by regulatory divergence within UK and EU common project regulations.
- Compliance risks associated with the extant implementation dates and description of technical solutions.

5.13 The recommended course of action is planned to be presented to the UK CAA Airspace Modernisation Strategy Board in Q2 2025, for decision on next steps.

5.14 The longer-term question of the necessity, applicability and scope of common projects in the UK is a broader piece of work that the UK CAA will address in the medium-term.

5.15 The UK CAA is working to ensure that we legislate in the best interests of the UK for the modernisation of air traffic management arrangements, ensuring interoperability, synchronising the deployment of technology, and protecting UK interests, ensuring the industry is not disadvantaged.

[31] The Air Traffic Management (Regulation (EU) No 716/2014) (Amendment) Regulations 2022 No. 211

5.16 Further detail of progress relevant to the Pilot Common Project regulation can be found within Chapter 5, Co-sponsors' Update.

Airspace Modernisation Oversight

5.17 Reporting into the Airspace Modernisation Strategy Co-sponsors, the UK CAA's delivery, monitoring and oversight role is carried out by the Oversight team in the UK CAA Strategy, Policy and Communications Group and is independent from the UK CAA's delivery teams sat within the Safety and Airspace Regulation Group. The key function of the team is to oversee, track and regularly report on the delivery of the Airspace Modernisation Strategy elements to the Co-sponsors and annually to the Secretary of State. That function is performed through formal engagement with the industry delivery entities, the outputs of which have been captured under Chapter 3 of this report.

5.18 The Oversight team is also responsible for administering and managing financial grants such as the Airspace Modernisation Strategy Support Fund, described in more detail later in this chapter.

5.19 In 2024 a recruitment campaign was held to ensure adequate oversight resource is in place, in line with the broadened governance requirements under the refreshed Airspace Modernisation Strategy. The team is now complete and consists of the Head of Airspace Modernisation Oversight, three Airspace Modernisation Oversight Principals, one Airspace Modernisation Oversight Risk and Benefits Manager and four Airspace Modernisation Oversight Associates.

5.20 In 2024, the Oversight team engaged with members of the Stakeholder Engagement Group, National Air Traffic Management Advisory Committee[32] (an advisory body chaired by the UK CAA with representation across the UK aviation community and a key engagement entity within the Airspace Modernisation Strategy Governance) and the Industry Coordination for the Airspace Modernisation Strategy forums to update their members on the progress with delivery of Airspace Modernisation.

Airspace Modernisation Strategy – Development

5.21 On behalf of the Co-sponsors, the Airspace Modernisation Strategy Development team manages the strategic and operational planning elements of the Airspace Modernisation programme. In this role, the team acts as a nexus at the heart of the wider airspace modernisation programme, drafting the overarching strategy and producing the supporting publications, and providing a cohering function for the delivery teams and stakeholders responsible for delivering elements of the plan. In addition to its internal responsibilities, the team maintains strong working relationships with international partners such as International Civil Aviation Organisation, EUROCONTROL and the US Federal Aviation Administration,

[32] National Air Traffic Management Advisory Committee

ensuring that the UK Airspace Modernisation Strategy remains aligned with international plans and programmes.

5.22 As part of its wider coordination and alignment task, the Airspace Modernisation Strategy – Development team is also responsible for continuously assessing and ultimately deciding whether to accept the UK Airspace Change Masterplan through ongoing engagement with ACOG, as well as fulfilling Strategic Environmental Assessment and Habitats Regulations Assessment obligations for the masterplan.

5.23 A final element to the team's duties is to ensure extant UK legislation associated with the Airspace Modernisation Strategy and its deliverables is accurate and meets the evolving requirements of the Strategy.

Our Team

5.24 The Airspace Modernisation Strategy – Development team consists of a Senior Manager for Airspace Modernisation Strategy Development, four technical/ planning experts, two policy principals and an associate for support activities.

5.25 The team's key focus areas in 2024 are set out below.

Overall purpose: Establish, evolve and cohere the plans for delivering the UK Airspace Modernisation Strategy

5.26 In July 2024, the team published the third and final part of the Airspace Modernisation Strategy, introducing a technical deployment roadmap: CAP1711b - The AMS Part 3: Deployment Plan. Building on this, in December 2024, the team began preparing the first evolution of this plan, updating requirements, absorbing lessons learned and rolling forward the deliverables to meet essential milestones. The plan covers a short to medium-term horizon and is structured around a phased and synchronised implementation approach to ensure effective delivery.

Define strategic direction for UK Pilot Common Project

5.27 The team has been working on a solution to transform the extant assimilated law (UK Regulation 716/2014, the "Pilot Common Project") into a UK-specific framework. This will ensure continued progress in deploying Air Traffic Management functionalities to drive the essential operational changes needed for the provision of air navigation services within European airspace.

Assessing the Airspace Change Masterplan

5.28 In January 2024 the CAA published an updated addendum to the Iteration 2 acceptance decision (CAP 2312A Addendum) that accepted Airspace Chane

Organising Group's advice on the withdrawal of Cardiff airport from the masterplan.[33]

5.29 In June 2024 the CAA published an updated version of the Airspace Change Masterplan Assessment Criteria (CAP 2156a) and Acceptance Framework (CAP 2156b). These were updated to explain that the CAA decision to formally accept a masterplan will only be taken once the relevant CAP 1616 assessment has concluded.[34]

Higher Airspace Operations

5.30 The UK Higher Airspace Platform Systems Delivery Group was renamed the Higher Airspace Operations Delivery Group to better reflect the evolving subject and the various use cases that are expected. A Gap Analysis was completed to identify the overarching technical components needed to enable Higher Airspace Operations in the UK in the short, medium and longer terms for this to inform further planned work for the UK CAA to develop requirements and policy, including Air Traffic Management/Air Navigation Services technical requirements.

5.31 The team also engaged with industry to provide inputs and feedback to the European Concept for Higher Airspace Operations (ECHO) project. Furthermore, the UK CAA presented a paper on behalf of European States and EUROCONTROL at the International Civil Aviation Organization 14th Air Navigation Conference to further the international discussion and build consensus on Air Navigation Priorities for Safe and Efficient Integration of Higher Airspace Operations and the Transit of Space Operations.

International Representation

5.32 The team also provided state representation to the International Civil Aviation Organization Global Air Navigation Plan, ensuring that the UK plays an active role in shaping international airspace development and future regulations. Additionally, insights from Global Air Navigation Plan iterations help inform and refine future editions of the Airspace Modernisation Strategy constituent parts.

Key Engagements

5.33 In addition to engagement with the International Civil Aviation Organization, the team has closely liaised with aviation stakeholders and industry experts, and with European and American partners through agencies such as EUROCONTROL and the United States' Federal Aviation Administration. In November 2024, the UK CAA's Head of Airspace Modernisation and Head of Future Safety & Innovation attended a drone demonstration with the Federal Aviation Administration in Texas. This consisted of multiple drone operators and the

[33] https://www.caa.co.uk/commercial-industry/airspace/airspace-modernisation/airspace-change-masterplan/evolution-of-the-masterplan/
[34] https://www.caa.co.uk/commercial-industry/airspace/airspace-modernisation/airspace-change-masterplan/assessment-of-the-masterplan/

means of planning drone activity. This is a positive first step of collaboration between the UK CAA and the Federal Aviation Administration on the concepts for integrating new users of airspace and modernisation.

5.34 Additional key engagements in 2024 encompassed:

- Airspace Modernisation Stakeholder Engagement Group (January 2024)
- European Air Traffic Management Master Plan stakeholder workshop (April 2024)
- Farnborough Air Show (July 2024)
- International Civil Aviation Organization Air Navigation Conference ANC/14 2024 (August 2024)
- International Air Transport Association Air Traffic Services Working Group (September 2024)
- Industry Coordination for the Airspace Modernisation Strategy (May & November 2024)
- Airports UK (September 2024)
- Workshops with ACOG, NATS (En Route) plc, Ministry of Defence, and DfT (September & October 2024)
- Defence Aviation Safety conference (October 2024)
- EasyJet Forum (October 2024)
- Luton Local Airspace Infringement Team (November 2024)
- Project ECHO 2 Dissemination Event (November 2024)
- European Rotors Conference (November 2024)
- Stansted Local Airspace Infringement Team (December 2024)
- SESAR Innovation Days (November 2024)

UK CAA Airspace Modernisation Internal Governance

5.35 Delivery of UK CAA-led policy development projects under the Airspace Modernisation Strategy is governed by a three-tier internal UK CAA approach.

UK CAA ExCo Airspace Board

5.36 The top level of internal UK CAA Airspace Modernisation governance is the UK CAA ExCo Airspace Board. This provides strategic direction on Airspace Modernisation in the short term and long-term. This board provides strategic direction at a senior leadership level.

5.37 The ExCo Airspace Board is accountable to the UK CAA Board for overall management of Airspace Modernisation and the UK CAA's delivery of the elements defined within the strategy. The ExCo Airspace Board provides direction on appropriate frameworks, policies and procedures to support delivery of Airspace Modernisation objectives. Using the frameworks in place, the board monitors and reviews performance and agrees corrective measures where necessary.

5.38 The ExCo Airspace Board will oversee the ongoing development of the Airspace Modernisation Strategy so that when it is presented to the Secretary of State for Transport, it is robust in terms of its scope, objectives, priorities and performance measures.

5.39 The ExCo Airspace Board is also the formal route to support the UK CAA Board, through Group Director Safety and Airspace Regulation Group, in effectively discharging the UK CAA's responsibilities under the air navigation functions as per the Air Navigation Directions from the DfT. Alongside this, the board provides strategic direction on issues where there is a read across to the economic regulation of NATS (En Route) plc and funding of UK CAA airspace activities from airspace user charges.

5.40 In 2024 the ExCo Airspace Board met ten times and made decisions on, for example, airspace risks, a review of the Part 3, and its publication date, and the Airspace Change Masterplan.

Airspace Modernisation Programme Board

5.41 The second level of internal UK CAA Airspace Modernisation governance is the Airspace Modernisation Programme Board.

5.42 The UK CAA Airspace Modernisation Programme Board monitors delivery progress of the Airspace Modernisation Strategy elements. It is responsible for safety assurance, delivery, strategic alignment, funding and resources.

5.43 The board, which comprises of different teams and areas of expertise, focusses on airspace and associated infrastructure developments to support delivering Airspace Modernisation where the UK CAA has the lead. The board has representation from the delivery teams who are accountable for policy development areas of the Airspace Modernisation Strategy.

5.44 The broad scope of the elements offers the group a unique insight into the potential cross technical policy dependencies and can therefore make informed decisions on UK CAA delivery and input. In Q3 2024 the Head of Airspace, Air Traffic Management and Aerodromes took over chairing responsibilities from the Head of Airspace Modernisation. This was to enable the Head of Airspace, Air Traffic Management and Aerodromes to receive updates on the UK CAA project deliverables and provide steers on issues and make decisions.

5.45 During 2024, monthly Airspace Modernisation Programme Boards were held with key updates and risks presented by the UK CAA internal delivery teams. Programme board decisions included agreeing for a Defence Airspace and Air Traffic Management representative from the Ministry of Defence to attend its meetings, for pilot common project updates to be shared at its meetings and agreeing with Future of Flight to use an iterative approach and focus effort on demonstrations to collate relevant data to feed into policy and planning.

Airspace Modernisation Strategy Board

5.46 Initiated in 2024, the Airspace Modernisation Strategy Board is at the second level of internal UK CAA Airspace Modernisation governance. Reporting to the ExCo Airspace Board, the Airspace Modernisation Strategy Board is charged with ensuring the UK Airspace Modernisation Strategy continues to address national and international obligations.

5.47 The Airspace Modernisation Strategy Board provides strategic direction on the iterative nature of the Airspace Modernisation Strategy and, where appropriate shall accept or challenge updates to the Airspace Modernisation Strategy Parts 1 and 2 (CAP 1711 and CAP 1711A). As the Co-sponsors, the DfT will be kept informed of any changes to the strategy.

5.48 Throughout 2024 the Airspace Modernisation Strategy Board met to discuss progress on activity, for example initial steps to further define the fourth strategic objective of the Airspace Modernisation Strategy (environmental sustainability). The board received regular updates on external Airspace Modernisation delivery plans from regular oversight of ACOG, NATS (En Route) plc and the Ministry of Defence. The board also discussed regulatory requirements detailed within the UK Pilot Common Project (Commission Implementing Regulation (EU) No 716/2014), and the review of the regulation to consider its relevance and suitability in relation to the Airspace Modernisation Strategy.

Airspace Modernisation Control Boards

5.49 The third level of internal UK CAA Airspace Modernisation governance is the Control Boards. In July 2024, the UK CAA published the Airspace Modernisation Strategy Part 3 Deployment Plan (CAP 1711b) which outlines a technical deployment roadmap. Several projects require the UK CAA to complete delivery activities. To facilitate this work within the Airspace Modernisation governance framework, two Control Boards have been established, the Integrating Lower Airspace Control Board and the Air Navigation Control Board.

5.50 The Control Boards provide oversight to project activity, responsible for directing projects in accordance with business priorities and strategic objectives. The Control Boards manage the oversight of funding, resource allocation, technical direction and delivery approach. The Boards regularly monitor progress by

means of reporting throughout the project lifecycle and into the Airspace Modernisation Programme Board.

5.51 Established in September 2024, the Integrating Lower Airspace Control Board met monthly to focus on the progression of projects within its remit. Some of the projects include Uncrewed Traffic Management, Ground Infrastructure, Electronic Conspicuity, Detect and Avoid and Airspace Architecture. The Board has provided endorsement to enable projects to progress and take decision making to the Airspace Modernisation Programme Board. Throughout 2024 the Board has provided endorsement to enable projects to progress activity, including the approach to strategic objectives, approving the concept of operations for Electronic Conspicuity, the proposed approach to develop uncrewed traffic management policy and supported airspace architecture key design decisions. Work is taking place to look at the integration of uncrewed aircraft systems into airspace. The UK CAA is also considering what System Wide Information Management looks like for the UK, ensuring international harmonisation with the systems we implement.

5.52 The Air Navigation Control Board was established in September 2024, meeting monthly to maintain oversight of projects such as Performance Based Navigation, Flexible Use of Airspace, Communications, Navigation and Surveillance Infrastructure Development and High-Altitude Integration. The Board regularly met to track progress of projects, maintaining regular understanding of associated risks and approving upwards reporting shared with the Airspace Modernisation Programme Board.

Airspace Modernisation Strategy Part 3: Deployment Plan CAP 1711b

Background

5.53 The refreshed Airspace Modernisation Strategy was published in January 2023 consisting of Parts 1 (Strategic Objectives and Enablers) and 2 (Delivery Elements). In July 2024 the UK CAA published the first version of the Airspace Modernisation Strategy Part 3: Deployment Plan, a significant milestone in the once-in-a-generation work to modernise the UK's airspace. Publication of this plan was a significant and crucial step forward in setting out the key activities and milestones the industry and regulator needed to deliver together, alongside the regulatory frameworks required.

Portfolio of delivery plans

5.54 The Airspace Modernisation Strategy Part 3 portfolio represents a programme delivery plan supporting over 100 projects, with 23 of these already in progress, including the airspace change Masterplan. Nearly half of the projects in this Part 3 iteration are being progressed by industry partners. This delivery plan seeks to

enable all stakeholders to better understand the route to achieving a holistic modernisation of airspace; from underpinning operational policies and clearly sequencing milestones, to outlining dependencies between the various delivery elements. In turn, this should allow all parties to plan their delivery activities with more certainty moving forward

5.55 In consultation with its airspace and air traffic management policy subject matter experts, NATS (En Route) plc and others, the CAA Airspace Modernisation Strategy Development team looked in detail at the various delivery elements that were underway or required to meet the intent of the Airspace Modernisation Strategy. These elements were mapped against the competencies and resources available to develop a viable 'two plus five years' delivery framework.

5.56 The plans presented in Part 3 capture work already underway through the original 2018 Airspace Modernisation Strategy as well as activity commissioned or completed since the refreshed Airspace Modernisation Strategy was published in 2023. Part 3 draws together the means of delivering modernised airspace through organised project teams. It will be further developed as these plans evolve.

5.57 The activity timelines in Part 3 are therefore regarded as a first iteration that provides the foundation for the modernisation programme at the time of writing but was always intended to be updated periodically as the Airspace Modernisation Strategy progresses and as the external context and aviation environment (national, regional and global) evolves. Given its interface with the delivery aspects of the programme, Part 3 will be refreshed more often than Parts 1 and 2.

More about the Airspace Modernisation Strategy Part 3 and Further Development

5.58 Part 3 (Deployment plan) is a collection of delivery plans in support of the vision, strategic objectives and outcomes described in Airspace Modernisation Strategy Parts 1 and 2. For each delivery element, it sets out plans in the form of key activities and milestones, including:

- a detailed description of the contemporary UK CAA focus areas, including committed projects and work that is ongoing or commencing within the next two years
- an overview of other UK CAA activities currently being scoped, largely to take place over the subsequent five years.

5.59 Part 3 therefore sets out the intended direction of airspace modernisation over the next seven years. It does not describe in detail the delivery plans led by the ACOG, NATS (En Route) plc or others in support of the Airspace Modernisation Strategy, although it takes account of and refers to them. We intend to include a

fuller description of these non-UK CAA activities, where available, in future versions of the Part 3, with the next iteration planned for publication in Q2 2025.

5.60 We also anticipate that there will be some changes to all parts of the Airspace Modernisation Strategy as the aviation landscape continues to evolve, as international and UK policy obligations change, and as we begin to deliver against Airspace Modernisation Strategy objectives. As well as the content, the method of presentation is likely to evolve as the Airspace Modernisation Strategy develops over the coming years and the areas of scope and delivery methods are better understood. We have shared and sought feedback from industry, other states and international organisations and will consider whether we can present the plans online in a form that will be easier for users to interact with and interrogate, than the current Part 3 document.

Airspace Modernisation Strategy Support Fund

Background

5.61 In 2020, the UK CAA established the Airspace Modernisation Strategy Support Fund to aid projects in support of the delivery of Airspace Modernisation, where delivery benefits multiple stakeholders, or research will enable wider industry deployment. It follows on from the 2015–2019 Future Airspace Strategy Deployment Facilitation Fund[35] (specifically the Small Gaps element) but is broader in scope and has a new advisory function within its governance. It provides the opportunity for recognised UK legal entities[36], other than NATS (En Route) plc and the UK CAA, to apply for financial support to deliver activities in support of airspace modernisation, ensuring that the required work cannot be funded by other means.

5.62 More information, including current project descriptions and guidance on how to apply, can be found on a dedicated Airspace Modernisation Strategy Support Fund webpage[37].

5.63 The fund of about £2 million per annum is funded through the UK en-route unit rate, charged to aircraft receiving air traffic services in the UK. It was established as part of the UK regulatory cycle reference period (RP3) performance plan and maintained in the NATS (En Route) plc Regulatory Period 23 (NR23) performance plan. It is administered by the UK CAA, on the basis that unused funds will be returned to airlines through an adjustment to the UK unit rate in a future regulatory period.

5.64 For proposals to be eligible for funding, they must align with the overall objectives of the Airspace Modernisation Strategy, as well as other criteria. We expect a

[35] CAP1249: FAS Deployment Facilitation Fund
[36] Legal entities must be UK aviation industry, engaged in modernising the UK airspace.
[37] Airspace Modernisation Strategy Support Fund | Civil Aviation Authority

proposal's ambition to support the outcomes of modernisation. Funds are allocated based on a minimum of two calls for applications a year. We welcome any relevant proposals to be submitted, thereby providing an opportunity for a wide range of organisations to apply, where consistent with the Airspace Modernisation Strategy elements and objectives.

5.65 The Terms of Reference for the Fund can be accessed on the Airspace Modernisation Strategy Support Fund website and are contained within the publication CAP 2258[38].

Applications to the Fund in 2024

5.66 The first call for Airspace Modernisation Strategy Support Fund applications was issued in September 2021, and funds have been committed to 19 projects, totalling approximately £6.3 million, to date.

5.67 In 2024, two calls for proposals opened in May and October, with the UK CAA receiving 32 applications overall. As of December 2024, there is £4.4million in the Airspace Modernisation Support Fund pot, available to spend in future calls for proposals.

Governance

5.68 The Airspace Modernisation Strategy Support Fund Decision Board acts as an objective and independent decision-maker, with an Advisory Board providing advice to the Chair of the group on the approval or rejection of funding proposals. Airline representatives from Airlines UK participate in the advice and decision-making on individual applications.

5.69 Following a decision to fund a proposal, the Oversight team governs its delivery through the Airspace Modernisation Strategy Support Fund Programme Board, reporting regularly to the Airspace Modernisation Programme Board and Airspace Modernisation Strategy Board, and records the grant funding information in line with the UK subsidy control regime[39].

5.70 Further information regarding the dates of governance meetings and future calls for proposals are published on the Airspace Modernisation Strategy Support Fund webpage[40].

Airspace Modernisation Strategy Support Fund Programme Board

5.71 This is a monthly meeting comprised of airline representatives, UK CAA Subject Matter Experts, the Chair and Secretariat. During the Programme Board, the Chair gives an overview of the Fund to date. This includes how many projects are underway, associated progress updates, and updates on the financials. Any risks

[38] CAP 2258: Airspace Modernisation Strategy Support Fund: Terms of Reference | Civil Aviation Authority
[39] UK Subsidy Control Regime
[40] Airspace Modernisation Strategy Support Fund | Civil Aviation Authority

or issues are flagged, and claims are discussed and authorised. The Programme Board invites projects to discuss their deliverables and completed project reports and will ask questions and probe deeper into the findings and benefits of the projects.

Airspace Modernisation Strategy Support Fund Advisory Board

5.72 The Advisory Board is where applications received in the bi-annual call for proposals are discussed, assessed and scored to establish which projects will be recommended to the Decision Board for funding. The Advisory Board is comprised of UK CAA Subject Matter Experts, including those whose specific technical expertise is required in assessing the applications received, and airline representatives. Every application received is discussed and comments from Subject Matter Experts reviewed. Each application is scored on a matrix and the outcomes presented to the Airspace Modernisation Strategy Decision Board.

Airspace Modernisation Strategy Support Fund Decision Board

5.73 The Decision Board is comprised of airline representatives and UK CAA Subject Matter Experts. It is chaired by the Head of the Airspace Modernisation. The Oversight team, who administer and oversee the Support Fund, describe the application sifting and scoring process, and present their findings and the top-rated projects recommended for funding. The Decision Board will discuss the rationale as to why some projects have not been scored highly or recommended. Board members can challenge, seek further clarification or present a case as to why a project should be recommended for funding. The Chair agrees with Board members which projects should be funded and onboarded for that call.

Completed Projects

5.74 Eight projects had delivered their outputs by December 2024 and are now complete:

Electronic Conspicuity Interoperability Test Programme (Aviation Innovation Centre)

5.75 The objective of this project was to provide a rapid test facility with the expertise, systems and operational capability to gather accurate data about the interoperability of airborne and ground-based Electronic Conspicuity solutions. This is considering the performance of the associated airspace integration concepts that they are intended to enable. To view the final reports, email airspace.modernisation@caa.co.uk.

Light General Aviation Digitisation of Flight Data (Skyverse)

5.76 The project was a proof of concept to show end-to-end digital transfer of ‘Visual Flight Rules’ flight details via the internet, in order to cut out mundane radio transmission, reduce Air Traffic Control Officer workload and provide data-rich

information to all air navigation service providers. To view the final reports, email airspace.modernisation@caa.co.uk.

Flight Information Display Template Documentation (Custom Chess Company)

5.77 The project created a set of product-agnostic Flight Information Display template documentation, providing suitable guidance and Acceptable Means of Compliance to reduce the burden on Aerodrome Flight Information Service units. It provided some common standards to the documentation that will improve the efficiency of the UK CAA's approval process and encourage common standards across industry. Copies of the templates can be viewed by emailing airspace.modernisation@caa.co.uk.

Trial of Automatic Dependent Surveillance–Broadcast Obstruction Beacons on 978MHzUniversal Access Transceivers (uAvionix)

5.78 The purpose of the trial was to evaluate the results of the obstruction beacons from the point of view of the operator and other airspace users. This was achieved by gathering feedback both verbally, by email and via questionnaires. The final report can be viewed here.

Reduced Departure Divergence (Gatwick Airport)

5.79 The objective of this research project was to reduce the existing minimum standard angle of divergence for conventional departures below 45˚, validated using flight data from existing Standard Instrument Departure routes and a robust analytical approach to loss-of-separation risk modelling. To view the final reports, email airspace.modernisation@caa.co.uk.

Fair and Equitable Distribution of Aircraft Noise (Gatwick Airport)

5.80 By working with communities affected by aircraft noise, this project aimed to gain information to feed into future airspace changes that will allow the environmental impacts of aviation to be more fairly distributed. The project defined a set of metrics that can be used when a new airspace change application is being progressed, so that environmental impacts are reduced overall. The final report can be viewed here.

Electronic Conspicuity Interoperability Test Programme 2 (Aviation Innovation Centre)

5.81 This project followed on from phase 1 that completed in August 2023. This project included further evolution of the Flight Information Display to present the dynamically activated Temporary Reserve Area and enable automatic QNH (pressure) updates. It will also test the capabilities required to conduct remotely piloted aircraft systems operations in an atypical air environment. To view the final reports, email airspace.modernisation@caa.co.uk.

Enhanced use of Flight Intent Data (Skyverse)

5.82 This project demonstrated three further capabilities in relation to the enhanced use of flight intent data. These are ‘Route Validation Capture’, ‘Route Validation Sharing’ and ‘Flight Intent Actioning’. The project tested new technologies that could fundamentally change the way the UK builds a low cost, digital picture of visual flight rules and flight intentions without either impacting a pilot's right to roam nor mandating any new requirements of them. To view the final report, email airspace.modernisation@caa.co.uk.

Ongoing Projects

5.83 Eleven projects are ongoing as of December 2024:

Scottish Cluster Cumulative Impact Assessment (Edinburgh and Glasgow Airports)

5.84 The project team are currently writing up their final report, which will encompass lessons learnt on the Cumulative Analysis Framework, which can be shared with UK-wide airspace change proposals in the airspace modernisation programme.

Digital Transformation of Airspace Management (Airspace Unlimited Scotland)

5.85 The project is almost complete. The final report has been written on the D323 exercise area (a managed danger area) highlighting the benefits of better airline routing. The results show potential annual savings of 6,000 tonnes of UK carbon dioxide emissions and £1.8million in airline operating costs.

Next Generation Airspace Operations and Surveillance (LiveLink Aerospace)

5.86 The project is almost complete, and the final report is being written. The project developed, deployed and tested a new airspace technology, ‘Passive Detection and Radar’, which offers benefits like reduced carbon emissions, improved traffic routing and increased airport capacity.

Project Dragon’s Eye (Snowdonia Aerospace)

5.87 The project will soon begin the trial phase. From January 2025 until September 2025, there will be four airspace modernisation integration trials. These trials will allow testing of different aircraft combinations and cooperative and non-cooperative Detect and Avoid solutions, with enough time between tests for analysis, reporting and coordination with the UK CAA Sandbox Team.

Fuel-efficient Delay Absorption (GE Aerospace)

5.88 The project is currently in phase 2, which is designing the demonstration study environment. The goal is to create a proof of concept that can serve as a template for developing accurate trajectory predictions for each aircraft, offering targeted arrival advisories.

Digital Airspace Quantification to Support Risk-Based Operations (HexCam Ltd)

5.89 This project is currently on pause due to the required approval of the operational safety case. The project is currently in phase 3.

Advanced Drone Airspace Management

envAero

5.90 Work has begun on the scenario-testing report. The next steps involve testing different machine-learning techniques, predicting hourly flight counts, and analysing key features and parameters across airspace volumes of different types and sizes.

Performance-Based Navigation Arrivals Optimisation (Gatwick Airport)

5.91 The project started in October 2024 and is currently in phase 1, which involves creating the project plan and defining its scope. The goal is to address the Reduced Night Noise trial issues and develop guidance on implementing Performance-based Navigation arrivals at Future Airspace Strategy Implementation airports to achieve the expected noise benefits.

Reduced Departure Divergence – Validation of Industry Research for Updated Minimum Standards (Gatwick Airport)

5.92 This project started in October 2024 and is in its final phase. This project used a third-party organisation to validate the Reduced Departure Divergence Airspace Modernisation Strategy Support Fund research project that completed at the end of 2023.

Flight Path Design Visual Repository (Tetra Tech and Trax International)

5.93 The project started in October 2024 and is now in phase 2. The concept and requirements for the Design Visual Repository have been defined and the platform is ready. The next step is to transfer flight path data into the repository.

Electronic Conspicuity Interoperability Test Programme 3 (The Aviation Innovation Centre)

5.94 The project started in October 2024 and is currently in phase 1. It will build on the success of the Electronic Conspicuity Interoperability Test Programmes 1 and 2 to enhance electronic surveillance networks, like the one at Goodwood aerodrome, for airspace integration.

6 The Future of Flight

6.0 The Future of Flight Programme and Airspace Modernisation Strategy are intrinsically linked. The Future of Flight Programme delivers many of the enabling components of airspace integration in the short to medium term and is a crucial step to achieving the longer-term goals of the Airspace Modernisation Strategy. A significant number of the Airspace Modernisation Strategy delivery components are directly funded by the Future of Flight Programme. The UK CAA plays a key role in establishing the regulatory frameworks and processes necessary to realise the UK's Future of Flight vision, while ensuring the safety of the public and all aviation stakeholders.

6.1 In March 2024 the UK CAA appointed the Future of Flight Programme Director and Head of Future, Safety and Innovation team whose role is to enable the delivery of the change programme required to support aerospace innovation in the UK.

Future of Flight Action Plan

6.2 The UK CAA, as a key partner with DfT to deliver the Future of Flight Programme for the UK, is committed to the integration of Future of Flight vehicles into aviation and transport networks. The aviation industry and government have collaborated to create a comprehensive strategy for the sector's growth, supporting the UK economy, society and environment while maintaining high safety and security standards.

6.3 The Future of Flight Programme will deliver the regulation, technologies and infrastructure for the routine use of innovative aircraft, so that they are safe, secure, sustainable and work for citizens and communities. To fully realise the benefits of Future of Flight technologies for the UK (drones/ Unmanned Aircraft Systems and Advanced Air Mobility), the Future of Flight Programme is working towards:

- enabling routine Beyond Visual Line of Sight drone operations at scale in integrated airspace by 2027; and
- enabling piloted electric vertical take-off and landing aircraft from 2028 to deliver better connectivity across the UK and economic growth.

Digitalising Specific Category Operations

6.4 The Digitalising Specific Category Operations (DiSCO) project is modernising the UK Remotely Piloted Aircraft System Operational Authorisation application process. PDRA01 authorisations were launched on the new platform in April 2024, reducing average customer application processing times from an average of 13 days to 30 minutes. This is a substantial benefit to the Remotely Piloted Aircraft System sector, reducing administrative effort, shortening application lead times, and providing greater certainty for application outcomes. In November 2023 the UK CAA confirmed membership of the DiSCO Stakeholder Working Groups, who have provided valuable insight and support into this project.

6.5 The UK Specific Operation Risk Assessment will launch on the platform in April 2025, joining the 60+ countries who already operate under the Specific Operations Risk Assessment methodology developed by the Joint Authorities for Rulemaking on Unmanned Systems. UK Specific Operation Risk Assessment replaces the existing Operating Safety Case methodology approval process which has been criticised for long application lead times, has generated dissatisfaction from customers and has reduced the efficiency of UK CAA colleagues.

6.6 The introduction of the Specific Operation Risk Assessment methodology alongside this new digital platform addresses all these issues as well as providing a more transparent, quantitative risk assessment framework, which, coupled with new Remote Pilot Competency and Flight Worthiness frameworks, will substantially improve the safety assurance to Remotely Piloted Aircraft System Operators and the UK CAA. Launched on 3 April 2024, it introduces the PDRA01 Online Application Tool, which streamlines applications for PDRA01 Operational Authorisation with a 24-hour processing time, low flat fee, automatic notifications and self-service access, including templates for operations manuals and logbooks.

6.7 The next version, expected in Q1 2025, will incorporate Specific Operations Risk Assessment methodology for all Specific Category Operational Authorisations, including complex Beyond Visual Line of Sight operations.

6.8 In March 2024, the UK CAA published CAP 2973: Cyber Security Guidance for Innovators[41]. The guidance aims to equip innovators with a foundational understanding of cyber security and identify potential attackers targeting their technologies, both presently and in the future. It emphasises existing and forthcoming regulations while offering frameworks and resources that innovators can leverage to integrate cyber security considerations into their upcoming projects.

[41] CAP2973: Cyber Security Guidance for Innovators | Civil Aviation Authority

Unmanned Aircraft Systems and Electric Vertical Take-off and Landing Aircraft

6.9 The recently formed Test & Evaluation unit has been stood up to ensure that the UK CAA is gathering data from early operations and using these learnings to develop better policies. We have been analysing data from early integrated Beyond Visual Line of Sight operations in Temporary Reserve Areas and also Atypical Air Environment operations.

6.10 The UK CAA has combined its Innovation Advisory Team with Future Safety and Innovation. This ensures that industry partners have a single point of contact within the UK CAA to provide support and continuity. Industry partners provide feedback from their operations as part of the iterative process of developing and demonstrating the regulatory frameworks needed to achieve the Future of Flight Programme and provide an additional layer of safety as part of the test and trial process. As part of this collaboration, industry frequently agrees to confidentially share its test data with the UK CAA, which provides further evidence of the effectiveness of the regulatory framework, developed as part of the Future of Flight Programme. This is then fed back into the UK CAA policymaking in a process of continuous improvement.

6.11 In support of the Future of Flight Programme, the UK CAA and DfT were tasked by the Law Commission to review the law around autonomous flight, to support the safe development of rapidly advancing technology. The first consultation on autonomy[42] in relation to electric vertical take-off and landing and drones was published in February 2024 and closed in June 2024. The second consultation in relation to Air Traffic Management is expected to be published in early 2025, followed by a final report at the end of 2025.

6.12 In January and July 2024, the UK CAA has published a series of important guidance for the electric vertical take-off and landing industry, including policy statements on battery handling[43] [44], eVTOL Initial and Continuing Airworthiness, Flight Operations and eVTOL Pilot Licensing[45]. The UK CAA has extended Vertical Aerospace's Design Organisational Approval to enable them to further develop their four-passenger VX4 aircraft in the UK.

6.13 The UK CAA has also formally agreed how to collaborate with European Union Aviation Safety Agency on certification. This ensures that UK manufacturers are able to design and develop these innovative types of aircraft in the UK, safe in the knowledge that there is a straightforward route to international certification and market. The UK CAA is also continuing to work on formalising regulatory

[42] Aviation Autonomy
[43] Policy Statement On Battery Handling Rules For VTOL Aircraft Using
[44] CAP3014 Statement on Battery Handling Rules for VTOL
[45] Licensing Pilots of VTOL-Capable Aircraft - Civil Aviation Authority - Citizen Space

harmonisation work with the United States' Federal Aviation Authority and other national aviation authorities.

6.14 The UK CAA has consulted on design standards for currently licensed Aerodromes that wish to accept electric vertical take-off and landing aircraft (published in July 2024) and has also setup a stakeholder working group to discuss vertiport design. The UK CAA has conducted a comprehensive analysis of the current flight operations rules relative to vertical take-off and landing operations and has also set up a stakeholder working group to discuss operations policy for electric vertical take-off and landing aircraft.

6.15 The use of mobile communication networks in an aviation context (CAP 2988[46]) was published in May 2024. It is an overview of the UK CAA internal study, commissioned by UK Research and Innovation, enabling the UK CAA and UK Government to better understand the benefits and drawbacks of using Mobile Communications Networks in an aviation context.

6.16 In July 2024 the UK CAA has also published CAP 3008, a guide for operators who wish to carry out Unmanned Aircraft Systems Beyond Visual Line of Sight operations in the Specific Category in the UK under current regulations[47].

6.17 The Airspace Coordination Obstacle Management Service portal has been updated, and it now allows users, including Unmanned Aircraft Systems Operators, to notify the UK CAA about activities needing Notice to Aviation (NOTAM) alerts for other airspace users, such as recreational pilots, kite fliers, airports, Unmanned Aircraft System operators and commercial entities. Unmanned Aircraft System Operators can now submit requests directly to the regulator through a streamlined system designed for improved simplicity, speed and accuracy. Additional details regarding the process of accessing and registering for the customer portal are available on the UK CAA website[48].

6.18 CAP 3040: Unmanned Aircraft Operations in an Atypical Air Environment: Policy Concept[49] published in October 2024 enables drones to fly beyond visual line of sight operations using Atypical Air Environments as one of their key safety mitigations against the risk of mid-air collisions. This will allow operators to apply to use Atypical Air Environments to carry out operations including long-distance inspection of infrastructure such as power lines and wind turbines, as well as site security.

6.19 The UK CAA publication CAP 3038 presents the individual components, delivery model and roadmap, to enable routine Unmanned Aircraft System Beyond Visual Line of Sight Operations in the UK in the Specific Category[50]. The publication

[46] CAP2988 The use of Mobile Communication Networks in an Aviation Context
[47] CAP3038: Delivering Scalable UAS BVLOS in the Specific Category - The UK CAA Technical Strategy Delivery Model
[48] Notifying airspace users of drone and remotely piloted events or activity | Civil Aviation Authority
[49] CAP3040: Unmanned Aircraft Operations in an Atypical Air Environment: Policy Concept | Civil Aviation Authority
[50] CAP3038: Delivering Scalable UAS BVLOS in the Specific Category - The UK CAA Technical Strategy Delivery Model

sets out how the UK CAA will achieve two key milestones on that journey: demonstration of Beyond Visual Line of Sight activities by the end of 2024 and evolving towards routine Beyond Visual Line of Sight operations in 2027/2028.