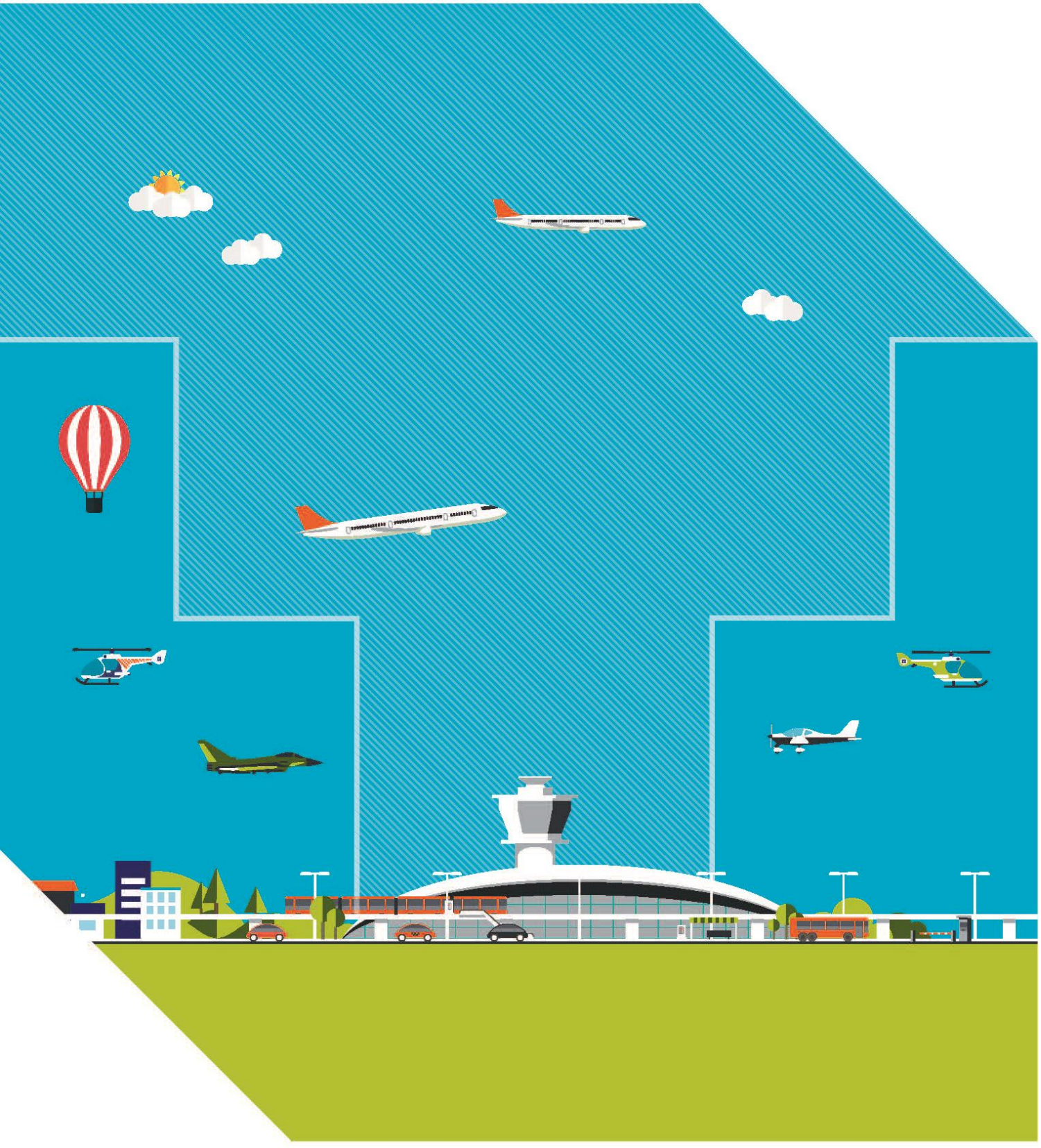
Airspace Modernisation – 2021 Progress Report

CAP 2281



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Revision history

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The latest version of this document is available in electronic format at www.caa.co.uk/CAP2281

Contents

Executive Summary

1. In 2017, the Government updated the Civil Aviation Authority's (CAA's) strategic role for airspace modernisation by issuing new Air Navigation Directions. Consistent with our role as specialist aviation regulator and our statutory responsibilities, we are required to prepare and maintain a co-ordinated strategy and plan for the use of UK airspace for air navigation up to 2040, including for the modernisation of the use of such airspace.

2. Our Airspace Modernisation Strategy[1] responds to that requirement, setting out the detailed initiatives that industry must deliver to achieve the objectives envisaged in current Government policy.

3. The strategy sets out the ends, ways and means of modernising airspace, initially focusing on the period until the end of 2024.[2] The **ends** are derived from UK Government and relevant international policy and the **ways** of achieving them are set through fifteen initiatives that include new airspace design, new operational concepts and new technologies. To establish the **means** of delivering modernised airspace, such as the resources needed, the strategy requires the entities responsible for delivering the initiatives to draw up delivery plans, with progress overseen by the CAA.

4. The 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 of detail on the progress made by the industry, as well as on the work the CAA have conducted in 2021.

5. In Chapter 1 we provide an overview of the current initiatives and our assessment of progress towards completion of each one. This has been done in the form of a 'RAG' status and compared against progress made in 2020.

1 CAP1711 Airspace Modernisation Strategy December 2018

2 2024 corresponds to the end of the next Single European Sky Performance Scheme reference period (RP3)

6. Six of the fifteen initiatives are assessed as on track (green), an improvement on four reported as on track in 2020. Five initiatives require attention, also an improvement on the nine reported last year. Predominantly the impact concerns delayed timescales of delivery against the original plans set out within the Airspace Modernisation Strategy, which may have shifted as a result of ongoing recovery of the aviation industry from the COVID-19 pandemic. Four initiatives have been assessed as having 'major issues', due to the need for further legislations on Performance Based Navigation and Air Traffic Management, core elements of airspace modernisation strategy.

7. Key areas of progress have been noted within Free Route Airspace (Initiative 2) with successful delivery of the Airspace Change Proposals sponsored by National Air Traffic Services (NATS) (En Route) plc. Remobilisation and progress, coordinated by the Airspace Change Organising Group (ACOG), under the FASI South and North airspace change programmes (Initiatives 4 and 5), were also made possible by the Government funding support package. A key milestone has been achieved on the programme in December 2021, with ACOG submitting Iteration 2 of the Masterplan for assessment by the CAA.

8. Initiatives 9, 10 and 11, which are at the CAA Policy Development Stage, have also demonstrated progress. Work on the Flight Information Service is now complete, with the publication of '*Supplementary Instruction CAP 797 SI 2021/03 FISO Manual: Use of ATS Surveillance Systems in Aerodrome Flight Information Service'* in December. The workstream now awaits the Airspace Modernisation Strategy refresh and work on the Lower Airspace Service replacement to continue. We have also decided to refresh and adopt a regional approach to the Airspace Classification Review workstream, with an expectation to move to the Amend phase for the Cotswold Region in April 2022. The CAA has also reached an agreement with the Department for Transport (DfT) regarding Electronic Conspicuity and established an Industry Surveillance Task Force, to develop air and ground specifications for Electronic Conspicuity.

9. In Chapter 2 we provide an update from the Co-Sponsors on the policy and regulatory process, with a particular emphasis on stakeholder engagement activity undertaken as part of the Airspace Modernisation Strategy Refresh and the re-introduction of the Airspace Modernisation Strategy Support Fund. Strategic risks have also been flagged within this chapter, predominantly concerning the future delivery model, financing, and resourcing of the modernisation programme.

10. Chapter 3 provides updates related specifically to activities under the Airspace Modernisation Strategy, undertaken within areas of particular interest from the General Aviation and Communities stakeholder groups.

Chapter 1

Delivery Plans and Progress 2021

1.1 There are currently fifteen Initiatives, set out within CAP1711 Airspace Modernisation Strategy, published in 2018. Chapter 1 contains an overview of the existing Airspace Modernisation Strategy Initiatives and their delivery plans.

1.2 Table 1.1 assesses the level of progress made under each Initiative and within each section, indicated by a **green**, **amber** or **red status** and compared with progress indication made in the previous year:

- green status indicates that the Initiative is on track to be completed in the timescales expected.
- amber status indicates that the Initiative needs attention from key stakeholders to ensure completion in the timescales expected, or that there may be merit in reconsidering deadlines where possible.
- red status indicates there are major issues with the Initiative and a significant risk that completion will not be achieved in the timescales expected.

1.3 In line with the format of the Airspace Modernisation Strategy, each initiative within this report is layed out and described in scope sections, highlighting areas which will require modernisation. Those areas of work are defined as: **.1 Airspace Design**, **.2 Operational Procedures** and **.3 Technology Enablers**. Progress of work under each scope area has also been assessed, as per the RAG status indicated above.

1.4 A Trend Indicator has been provided with progress status as follows:


Progress is getting **worse**; severity is trending up


Progress is getting **better**; severity is trending down


Progress is **steady.**

1.5 Key dependencies and risks to the realisation of modernisation benefits are also summarised in Table 1.1. The risks are assessed on a 1 (low) to 5 (high) scale against likelihood (L), and severity (S).

Table 1.1 Initiative plan and progress status - December 2021

UPPER AIRSPACE

Description: deployment of additional waypoints to the existing route network.		**Implemented**
1.1 New waypoints	1.2 Established procedures	1.3 Airline flight planning system
Timescale: 2018	**Driver:** UK Statutory Instrument / Airspace Modernisation Strategy	
Stage: Implemented	**Mechanism:** NATS (En Route) plc Service and Investment Plan	

Progress Update

The implementation of Direct Route Airspace was mandated by Implementing Regulation EU 716/2014, as retained (and amended in UK domestic law), under the European Union (EU) (Withdrawal) Act 2018.

Direct Route Airspace as a steppingstone towards Free Route Airspace (see Initiative 2).

This Initiative is now considered as implemented and closed, because NATS (En Route) plc has dedicated efforts and resource to further optimise airspace design under the Free Route Airspace concept, as described below under Initiative 2.

Risks to benefit realisation:	**Score:**
n/a	n/a

UPPER AIRSPACE

Description: removal of all fixed routes so aircraft can fly fully optimised routes.	**2020** ⬆	**2021**
2.1 Remove fixed route network	2.2 New procedures	2.3 Airline flight planning system
Timescale: 2025+	**Driver:** UK Statutory Instrument / Airspace Modernisation Strategy	
Stage: Delivery	**Mechanism:** NATS (En Route) plc Service and Investment Plan	

Scope

Free Route Airspace, as defined by EUROCONTROL, is a *'specified airspace within which users can freely plan a route between a defined entry point and a defined exit point, with the possibility of routeing via intermediate (published or unpublished) waypoints, without reference to the Air Traffic Services route network, subject of course to availability. Within such airspace, flights remain subject to air traffic control'*.

The implementation of Free Route Airspace is mandated by the United Kingdom (UK) Regulation (EU) 716/2014. NATS (En Route) plc is intending to cover these requirements and Borealis Alliance[1] ambitions for the UK, whilst managing the deployment in line with other simultaneous airspace modernisation projects.

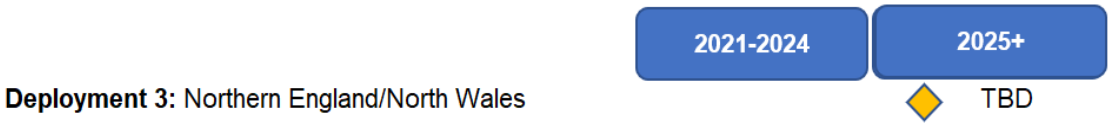
The programme was originally initiated in January 2015, to fulfil the key free route planning principles, where users could ultimately flight plan to preferred trajectories, irrespectively of the air traffic control responsibility boundaries across the Borealis-controlled airspace.

[1] The Borealis Alliance is a group of Air Navigation Service Providers collaborating on a major programme to deliver free route airspace across the whole of Northern European Union.

Key Milestones

Deployment 1 is on track for delivery in December 2021 with the Airspace Change Proposal approved and Operational Conversion Training of controllers and transition planning underway. An additional deployment of Free Route Airspace is included in the southwest approaches, as an enabler to permit the deployment of Free Route Airspace across Brest Control West sectors in December 2021.

Deployment 2 remains on track for delivery in Spring 2023 as part of the West Airspace Deployment with consultation currently underway having passed CAP1616 Stage 3B.



Deployments 3 and 4, delivery timelines have had to be revised as a consequence of the impact of the COVID-19 pandemic and delayed deployment of the Deployment Point (DP)-En Route technology platform. The timelines are subject to the regulatory cycle reference period NR23[3] consultation outcome, but the deployments are targeted

[3] In light of changes to the regulatory framework brought about by the UK withdrawal from the European Union and the impact of COVID-19, we expect to establish a new UK performance plan for the period 2023 to 2027, known as "NR23", which will supersede the RP3 performance plan.

currently as November 2025 and November 2026, due to their dependency with delivery of DP-En Route technology.

The timescale of this milestone is annotated as **'At Risk'** due to the consequence of planned delivery being beyond 2025, so there may be merit in revising the current timescale for completion.

Key Achievements

Deployment 1, the Airspace Change Proposal has been approved, the UK Aeronautical Information Publication changes have been published and operational staff training took place to support implementation in December 2021. The CAA's online Airspace Change Portal includes up to date information and documents for this change, which can be accessed here.

The Free Route Airspace D2.1 Airspace Change Proposal, for the deployment of Free Route Airspace in a small portion of the southwest approach in the London UIR, has been approved and was an important enabler for realising the benefit of delivery in the Brest West sectors. The online Airspace Change Portal includes up to date information and documents for this change, which can be accessed here .

The Airspace Change Proposal Phase 2 (FRA D2: ACP-2019-12), which supports deployment of Free Route Airspace across the Swanwick West Sector Group, is currently at Stage 3B of the airspace change process. It has undergone consultation in November 2021 with a planned implementation of March 2023. The CAA's online Airspace Change Portal includes up to date information and documents for this change, which can be accessed here.

NATS (En Route) plc has also engaged with Jeppesen and airlines to ensure flight planning systems can support the change.

Dependencies

Deployments 3 & 4 are dependent on the iTEC platform installation, which is part of Initiative 15, with timescales yet to be confirmed.

Overall, Free Route Airspace deployment progress has been made in 2021 and the phased introduction of Free Route Airspace will lead to a further two deployments targeting November 2025 and November 2026 to complete roll out across the UK.

A CAP1616 Statement of Need Assessment meeting was held with the CAA in October 2021 to commence work on these deployments.

Benefits

The key benefit of Free Route Airspace delivery is an improvement of Upper Airspace efficiency. In line with requirements set out within the Airspace Modernisation Strategy and the UK Statutory Instrument, it will deliver airspace harmonisation at a European Union level, enabling operational and fuel consumption cost savings, whilst reducing CO2 emissions, in line with environmental objectives, set out within the Department for Transport's Air Navigation Guidance 2017.

During the Options Appraisal Phase II Stage, NATS (En Route) plc submitted information regarding anticipated deployment benefits, which can be accessed through the links provided under the **'Key Achievements'** section above. NATS (En Route) plc estimates that D1 deployment could deliver up to 3,314T of fuel benefit per annum, equating to c 10,500T per annum of CO2 benefit.

D2 benefit analysis undertaken by NATS (En Route) plc as part of its Stage 3B submission, estimates a range of potential fuel benefit between 152 and 481T of fuel per annum, equating to between 483 and 1153T of CO2 per annum, dependent on the scale of structural limitations implemented. As this deployment will be concurrent with the West Airspace Deployment and enhanced Systemized Airspace arrangements in the lower airspace, the actual value is likely to change this estimate, dependent upon the resultant option chosen.

Both D1 and D2 fuel and CO2 figures are enabled benefits, and therefore realized benefits are contingent on airline flight planning behavior.

Whilst benefit scoping of D3 and D4 is yet to be undertaken by NATS (En Route) plc, a specific project, named '*Borders and Central',* has now been initiated and is currently in the 'Feasibility and Options' stage to determine the scope of the change.

Risks to benefit realisation	**Score:** 12
That aircraft operators do not invest in the flight planning system upgrades required to use Free Route options effectively and maximise the benefits of implementation. Full deployment of Free Route Airspace is dependent on the delivery of DP-En Route technology, which has suffered a number	(Likelihood:3) * (Severity:4)

	of delays in deployment and therefore may not deliver in the required timescale to support Free Route Airspace.	

Advanced Flexible Use of Airspace 3 — **FUA State Programme**

UPPER AIRSPACE

Description: to increase airspace configuration options supporting more efficient use.	**2020** ➡	**2021**
3.1 New airspace structures	3.2 New procedures	3.3 Airspace management tools
Timescale: 2022-24	**Driver:** UK Statutory Instrument / Airspace Modernisation Strategy	
Stage: Delivery	**Mechanism:** Flexible Use of Airspace State Programme Working Group	

Scope

Established in 2016, the Flexible use of Airspace State Programme Working Group have developed the Advanced Flexible Use of Airspace concept and a co-ordinated plan, based on design principles to accommodate both civil and military user requirements, through improved management of Special Use Airspace and flexible airspace structures for commercial and military use. The current scope of this Initiative relates particularly to deployment of the Advanced Flexible Use of Airspace concepts in the upper airspace. The implementation of Advanced Flexible Use of Airspace is mandated by UK Regulation (EU) 716/2014. **General Aviation Users** interested in low level flexibility of using airspace volumes shall refer to **Chapter 3** of this report.

The main activities that will deliver this Initiative include:

- airspace changes and redesign of airspace structures to offer more flexible locations, in line with military requirements and civil traffic flows,

- extending Airspace Management tools, processes, and data sharing, through access and use of the Local and Regional Airspace Management tool,
- implementing a new performance framework to provide statistics and trend analysis.

Key Milestones

Following some replanning as a result of the COVID-19 pandemic, NATS (En Route) plc launched the Airspace Management Enhancements project to support Advanced Flexible Use of Airspace delivery. In conjunction with the Ministry of Defence stakeholders, the programme of works to support airspace management tools development has been identified, planned, and progressed through 2021. That activity included development and implementation of military Airspace Change Proposals, including updates to Special Use Airspace, together with associated enhancements to airspace management processes.

Key milestones are broadly aligned to the Flexible Use of Airspace State Programme Working Group Reference Period 3 Performance Improvement and Delivery Plan, which has now been reviewed and updated. These include transition of key volumes of airspace into managed environments, now scheduled for Q2 2022, with full adoption of Local and Regional Airspace Management tool at Key Military Units for Q3 2022. There are also a number of Airspace Change Proposals in progress, to deliver these by 2023.

Key Achievements

Key achievements and areas of progress are listed below:

Ministry of Defence

- Airspace Trial for collective training complete with further use and updates to refine airspace.
- Launch of several Airspace Change Proposals to enhance and simplify airspace management across several Special Use Airspace including Military Training Areas and south coast danger areas (planned implementation from Q1 2022).
- Implementation of Joint Future Air Traffic Management Development Team sponsored changes including modernisation of south coast danger areas (July 2021).

- Launched review of future military requirements to develop planned airspace changes in NR23 for increasing military demand.

NATS (En Route) plc

- Local and Regional Airspace Management tool updated with additional capability to enable Free Route Airspace.
- Technical solution for extended access to Local and Regional Airspace Management tool developed (planned implementation Q2 2022).
- Progression of Business-to-Business connectivity with the Network Manager (planned implementation Q2 2022).
- Ongoing airspace management data integration with air traffic management systems (D-SESAR platform).

Risks

- The concept cannot be realised without improved utilisation performance, which relies on true interoperability, integration and commonality of tools, support systems and processes between the civil and military users.
- To mitigate against safety risks and enhance Collaborative Decision Making, integration of airspace management data to provide a level of automation is required.
- Due to the complexity of the programme and dependencies, any larger Ministry of Defence Airspace Change Proposal will not be delivered until after Free Route Airspace implementation.
- Lack of resource and funding availability may hinder implementation of the programme in the planned timescales. Mitigation activity is dependent on the NR23 plan agreement, for which NATS (En Route) plc is in the process of undertaking consultation engagement activity and Ministry of Defence resource to support development.

Benefits

The key benefit brought about by the deployment of Advanced Flexible Use of Airspace is efficient airspace management. It will make planning and sharing of airspace between agencies more collaborative and predictable. Reservation of any volumes of airspace needed for a particular military exercise or mission will be more efficiently tailored, thereby delivering operational efficiencies to the Ministry of

Defence, whilst minimising as far as possible any disruptive impact on other airspace users.

With that, additional airspace capacity will reduce the risk factors associated with traffic congestion and peaks in controller workload. Increasing the number of route options available to airspace users will allow air traffic controllers to manage more flights through the same sectors and aircraft operators will have the flexibility to plan and re-plan flightpaths in response to poor weather, segregated areas, and airspace restrictions.

The programme will further support delivery of environmental benefits, with aircraft having the flexibility to flight plan and fly more direct routes at more efficient altitudes and speeds, than with limited fixed waypoints, reducing emissions per flight and saving fuel.

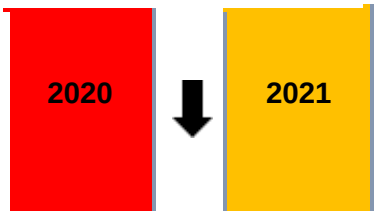
Finally, with the military having efficient and effective access to suitably sized and sited volumes of airspace to complete its missions, information on actual planned utilisation of reserved airspace will be shared in real time, enabling airspace to be handed between users with minimal unutilised time.

Risks to benefit realisation	**Score:** 9
That the implementation of new airspace structures restricts the access of civil and/or military traffic to key routes or volumes of airspace, generating inefficiencies and capacity constraints in certain areas of the UK; and that Advanced Flexible Use of Airspace will not deliver sufficient airspace to facilitate military activity.	(Likelihood:3) * (Severity:3)

FAS Implementation South & North — 4 and 5 — **ACOG**

TERMINAL AIRSPACE

Description: redesign of the terminal network in Southern England (#4), Northern England and Scotland (#5).



4.1 Terminal airspace redesign	4.2 New procedures	4.3 Not Applicable
Timescale: 2026+	**Driver:** CAA (Air Navigation) Directions / Airspace Modernisation Strategy / Government Policy	
Stage: Delivery	**Mechanism:** Airspace Change Organising Group	

Scope

Of the 15 initiatives in the Airspace Modernisation Strategy, two are known as Future Airspace Strategy Implementation – South, and Future Airspace Strategy Implementation – North (known as FASI-S and FASI-N respectively). These are complex airspace design programmes that require coordination between the different sponsors of airspace changes.

The CAA is directed to prepare and maintain a co-ordinated strategy and plan for the use of all UK airspace for air navigation up to 2040, including for the modernisation of the use of such airspace, under the Air Navigation Directions 2017.

The CAA and the Department for Transport have commissioned NATS (En Route) plc to lead the FASI-S and FASI-N programme to create a coordinated plan for airspace changes in the UK (or Masterplan for short). NATS (En Route) plc have established a separate and impartial unit, known as the Airspace Change Organising Group to carry out this task.

The sponsors involved in the FASI-S programme are NATS (En Route) plc (which manages upper airspace and its design) and the airports, which for FASI-S are: Biggin Hill, Bournemouth, Bristol, Cardiff, Exeter, Gatwick, Heathrow, London City, Luton, Manston, RAF Northolt, Southampton, Southend, and Stansted.

The FASI-S airspace change programme is particularly complicated due to the number of changes necessary to achieve modernisation over the south of the UK.

The FASI-N redesign of the airspace involves participation from NATS (En Route) plc and seven airports: Aberdeen, East Midlands, Edinburgh, Glasgow, Manchester,

Leeds-Bradford, and Liverpool. The Department for Transport and the CAA's co-commissioning for inclusion of the Northern airports within the Masterplan took place in 2021.

The programme paused in March 2020 due to the COVID-19 pandemic, as all of the FASI airports were compelled to refocus their attention on conserving liquidity and managing the crisis.

In March 2021, the Department for Transport announced that grant funding would be made available to airports to support the development of Airspace Change Proposals within the FASI-S and FASI-N programmes as part of the Government's commitment to supporting restart in the aviation sector and to decarbonisation. This grant, administrated by the CAA, enables eligible airspace change sponsors to restart their change proposals and progress through the first two stages of the regulatory airspace change process, CAP1616.

As part of the remobilisation of the programme, the Airspace Change Organising Group worked with the sponsors to integrate the outputs produced during Stages 1 and 2 of their Airspace Change Proposals into Iteration 2 of the Masterplan that has been delivered in December 2021 to the CAA for assessment.

Key Achievements

AIRSPACE CHANGE ORGANISING GROUP

Supporting Remobilisation and Re-establishing Airspace Change Organising Group's Organisational Structure & Governance

Following the announcement of the Department for Transport's grant funding in March 2021, the Airspace Change Organising Group has worked with the CAA and airport sponsors to ensure that the funding support package is allocated effectively and that the work across the Programme is phased to optimise the Masterplan delivery schedule. Prior to the COVID-19 pandemic, the Airspace Change Organising Group had finalised its organisational structure and established a central set of processes to drive delivery. However, considering the pandemic and the effect it has had on the programme and the wider aviation sector, the team has evolved. The governance arrangements and processes have been updated to ensure that the coordination activities remain efficient and effective.

Creating the Masterplan

The purpose of the Masterplan is to set out where airspace change could be taken forward, to provide benefits and to consider potential conflicts, trade-offs, and dependencies. The Masterplan does not set the detail of individual airspace designs or solutions. It will include a programme plan for the development of the individual changes that together will make up the Masterplan as well as an implementation plan for those changes. It will also potentially identify where any airspace changes could be needed to deliver a range of benefits, including to reduce noise, deliver air quality or fuel efficiency benefits or where more direct routes are possible that could reduce controlled airspace. **Criteria for the CAA to accepting the airspace change Masterplan** into the Airspace Modernisation Strategy, published in August 2021, are further described in Chapter 2 of this report. The CAA's acceptance of the Masterplan into the Airspace Modernisation Strategy makes the Masterplan, together with CAP1616, the legal basis against which individual airspace change decisions are made by the CAA.

Understanding Interdependencies and Integrating the Airspace Design

In 2021, the Airspace Change Organising Group started to work with the sponsors as they restarted their change proposals to define the nature of the interdependencies that exist and examine the potential solutions. With that purpose, the Airspace Change Organising Group has established Technical Coordination groups for 'deployment clusters' with clear Terms of Reference, to resolve technical design issues and brought together appropriately, applying lessons learnt from the working groups in situ pre-COVID-19. The Airspace Change Organising Group has also developed the methodology for identifying and assessing the impact of interdependencies, at a system level, for inclusion in the Masterplan. It has also developed the Terms of Reference for an airlines task force, to fully define the technology, procedures and airspace concepts needed to achieve the optimised use of Performance Based Navigation.

Demonstrating Impacts and Benefits

The Programme is expected to generate a range of benefits for a broad mix of stakeholder groups. Due the complexity of the Programme, it is possible that creating benefits that fall to one stakeholder group may at times lead to disbenefits for others. The trade-offs between benefits and disbenefits must be carefully managed and informed by widespread stakeholder engagement. Prior to the

COVID-19 pandemic, the Airspace Change Organising Group had started the production of a framework for quantifying and tracking the impacts and benefits of the component Airspace Change Proposals. The Benefits Framework will be incorporated into the Masterplan and continue to evolve as the sponsors move through the CAP1616 process and more information becomes available.

Stakeholder Engagement and Communications

The COVID-19 pandemic continued to impact the Airspace Change Organising Group's level of engagement in the first quarter of the year while the team focussed on securing the short-term funding necessary to restart the programme. During that time however, there were opportunities for the Airspace Change Organising Group to engage with key stakeholders, to reinforce the importance of airspace modernisation. As a result, a new website and social media channels was launched. The legacy 'Our Future Skies' information campaign, set up prior to the Airspace Change Organising Group's creation, has been discontinued, and a new platform One Sky One Plan has been developed to provide a publicly accessible entry point for those wishing to learn more about the programme.

Over the summer, Airspace Change Organising Group began its programme of stakeholder engagement around Iteration 2 of the Masterplan. In four initial sessions, Airspace Change Organising Group spoke to over fifty stakeholders that make up the Airspace Modernisation Strategy governance groups, to brief them on the development of the Masterplan. One-to-one follow up sessions took place and concluded in October. Airspace Change Organising Group have continued a programme of communications and engagement for the remainder of the year to promote its co-ordination role in the process, develop the Masterplan and demonstrate the importance of airspace modernisation for the future of UK's infrastructure. Summary of Airspace Change Organising Group's 2021 engagement activity has been set out within Table 1.1.1:

Table 1.1.1. Airspace Change Organising Group Stakeholder Engagement

2021 Engagement	
Group	**Detail**
Airports / NATS	Multiple dedicated engagement activities with all participating airport sponsors to help remobilise the programme including providing support for those sponsors who continued working on their Airspace Change Proposals during the programme pause. Engagement with a broad base of UK airports, airlines, and Air Navigation Service Providers at the Industry Coordination forum for the Airspace Modernisation Strategy (ICAMS). Regular engagement with airport communications teams.
Airlines	Dedicated engagement with airlines representatives as part of the Masterplan engagement and follow up sessions.
General Aviation and Remotely Piloted Aircraft System	Briefings to members of the General and Business Aviation Strategic Forum (GBASF) and the National Air Traffic Management Advisory Committee (NATMAC). Ongoing engagement with the Aircraft Owners and Pilots Association (AOPA), General Aviation Alliance (GAA) and its member organisations, on ACOG's role and objectives regarding airspace access and integration. Engagement with UK Research and Innovation and ARPAS on the potential for safe and efficient integration of UAS operations as part of the Programme. Dedicated engagement with GA and other airspace users as part of the Masterplan engagement and follow up sessions.
Community Representatives, Interest Groups and Local Government	Dedicated engagement with community representatives, airport consultative committees, devolved administrations and DfT's ANEG group as part of the Masterplan engagement sessions. b) A briefing was provided to the GLA's Environment Committee, on request, regarding the Airspace Change Programme and ACOG's coordination role. c) Briefings to the Luton Airport Consultative Committee and Heathrow Community Noise Forum on ACOG's role and the development of the Masterplan
Central Government	Written updates on the funding and progress of the Programme provided to key Government & parliamentary stakeholders. Regular updates provided by ACOG Steering Committee Chair to the Government's Airspace Strategy Board. Submission to DfT's Jet Zero consultation. Dedicated briefings for Members of Parliament.
Passengers, Businesses, and the Wider Economy	The Our Future Skies website and social media channels continued to make the case around airspace change and saw good levels of engagement from a range of stakeholders. The OFS site is being removed and a new information platform will be launched in the Autumn. Engagement with businesses and groups including London Chamber of Commerce and Industry and international couriers, UPS.
European stakeholders	Engagement with Senior Management at EUROCONTROL to ensure that the UK Airspace Change Programme maintains technical alignment as the Single European Sky initiative evolves. Engagement with colleagues from DARP (Dutch Airspace Redesign Programme) to share best practice and learnings.

FASI Sponsors

Majority FASI Airspace Change Proposal sponsors have remobilised their efforts on airspace change with the support from **The Future Airspace Strategy Implementation Programme Funding Support Package (FASI Grant)**, described in more detail within Chapter 2 of this report. Status of their progress against the various stages of assessment under CAP1616 has been summarised in Table 1.1.2:

Table 1.1.2. FASI Grant Recipients – Summary of Progress as of December 2021

Key: Complete; Not Started; On Track; Needs Attention; Major Issue

Airport Airspace Change Proposal Sponsor	Stage 1B Design Principles	Stage 2A Comprehensive List of Options	Stage 2B Refining Options to Shortlist	Stage 2B Initial Options Appraisal	Stage 2 Gateway	Progress Areas
Bristol					Feb-22	**Stage 2**: Developing and accessing airspace design options
Cardiff					Feb-22	
Exeter					Mar-22	
Edinburgh					Jul-22	
Glasgow					Jun-22	
Aberdeen					Sep-22	
Manchester					Jul-22	
East Midlands					Mar-23	
Gatwick					Jul-22	
Stansted					Mar-22	
Luton					Mar-22	
London City					Jun-22	
Biggin Hill					Sep-22	
Southampton					Jan-23	
Leeds Bradford					Feb-22	**Stage 1:** Developing airspace design principles with representative stakeholders
Heathrow					TBC	
Bournemouth					TBC	
Southend					TBC	

NATS (En Route) PLC

London Airspace Management Plan Deployment 1, part of NATS (En Route) plc's West Airspace Deployment project, established a revised pathway to deployment by splitting into two distinct Airspace Change Proposals, LD1.1 to support proposed network changes above 7000ft and progressing as a Level 2 Airspace Change

Proposal and the other, LD1.2, established to enable support to downstream changes, progressed as part of the Airspace Change Proposals being developed by Bristol, Cardiff, and Exeter. LD1.1 passed its Stage 3 (Consultation) submission in August and commenced an aviation stakeholder consultation on 6th September, running concurrently with the Free Route Airspace Deployment 2 consultation as deployment of these two projects will be concurrent. This enables the overall West Project to remain embedded within the FASI programme of change. NATS (En Route) plc remains committed to future FASI activities and the Masterplan Iteration 2 for all other low-level airspace change as planned within the FASI programme.

Manston

Following an unsuccessful gateway, the Sponsor is still at Stage 2 with the Airspace Change Proposal ACP-2018-75, documentation available here. The Sponsor has been instructed to work with the Airspace Change Organising Group on its coordination requirements with other FASI Sponsors and it is currently planning a Stage 2 gateway assessment in April 2022.

RAF Northolt

The Airspace Change Proposal ACP-2018-66 is currently in progress and at Stage 2, with documentation available here . There is a dependency with Iteration two of the airspace change Masterplan. It is anticipated that the Develop & Assess Stage 2 Gateway for this Airspace Change Proposal will be in June 2022.

Liverpool

The Airspace Change Proposal ACP-2015-09 is currently on pause at Stage 4, following a public consultation on a preferred airspace design with materials available here . The Sponsor is currently working with the Airspace Change Organising Group and the Airspace Modernisation Strategy Co-Sponsors to determine how best to integrate their proposal into the wider programme, given the low-level and network interdependencies that exist with Manchester airport and NATS (En Route) plc respectively.

Risks

Although the programme has successfully remobilised in 2021, a number of high priority risks continue to pose a significant threat and the impact on the scope and timeframes of the Programme. Those risks have been outlined below:

- Slower than anticipated recovery from COVID-19 continues to affect the aviation industry. This may result in inability for airport sponsors to continue with their Airspace Change Proposals beyond FY21/22. Despite the remobilisation of the Programme following the provision of Department for Transport's grant funding, the airport Airspace Change Proposal sponsors continue to operate under financial constraints which may limit their ability to invest in airspace developments in the near term. Airport sponsors that cannot access investment could fall behind and the timeline for delivery of the Programme might become misaligned. Due to the Airspace Change Proposals' interdependencies that exist, and the coordination required through the airspace change Masterplan, this could lead to significant non-linear delays to benefits realisation.
- Risks associated with the size and complexity of the changes required in the London Terminal Manoeuvring Area and the ability of the CAA and industry stakeholders to provide the necessary resource to ensure interdependent Airspace Change Proposals are assessed/approved and implemented in a cohesive, joined-up manner and is still a threat. However, whilst the CAA Instrument Flight Procedure resource is currently limited, expectations are to develop the team in 2022 to respond to the demand.
- Risk associated with uncertainty about future runway developments and the scope and timeframes of plans to introduce additional runway infrastructure in the South East of England. This risk may make it difficult for the airports and NATS (En Route) plc to determine the required scope of their Airspace Change Proposal and the nature of the dependencies between them. Heathrow Airport have started a new Airspace Change Proposal based on a two-runway configuration however, this may change in the future in line with evolving business plans and subject to recovery from the impacts of COVID-19.
- Risks associated with changes to the policy and regulatory framework that underpins airspace change: Possible changes to existing airspace related policies and regulations have the potential to hinder progress in developing

airspace changes and the policy objectives they should meet. For example, possible updates to the scope of the Air Navigation Guidance (2017). In addition, the Government published Transport Decarbonisation Plan and is expected to publish an updated Aviation 2050 Strategy, and a framework for the sustainable recovery of the aviation sector, which all have the potential to affect the Programme timescales.

Risks to benefit realisation	**Score:** 12
That the large number of co-dependent airspace changes required to modernise terminal airspace in the south of England are not co-ordinated effectively, leading to sub-optimal airspace designs, poor engagement with affected stakeholders, inefficient network integration and implementation delays. Inability of sponsors to undertake the work, due to financial and resource pressure, brought about by continued COVID-19 impact to sponsors' revenue.	(Likelihood:3) * (Severity:4)

Queue management 6 — NERL's SIP

TERMINAL AIRSPACE

Description: new capabilities to stream the flow of traffic.	**2020** →	**2021**
6.1 Linear Holding Structure	6.2 New procedures	6.3 Queue management tools
Timescale: by 2024	**Driver:** UK Statutory Instrument / ICAO GANP	
Stage: Delivery	**Mechanism:** NATS (En Route) plc Service and Investment Plan	

Scope

NATS (En Route) plc reports that queue management tools and procedures are relatively well developed and understood, with NATS (En Route) plc an active member of the Single European Sky Air Traffic Management Research Deployment Alliance. As part of the Service and Investment Plan re-planning, NATS (En Route) plc expect greater clarity on the scope, ambition, and timetable for further deployments of queue management, whilst focusing on benefit-driven approach to consultation with their customers.

Under the initiative's concept, NATS (En Route) plc envisages deployment of the Arrival Manager at Manchester and Stansted, upgrading Heathrow's Time-Based Separation to Pairwise and deploying Optimised Mixed Mode Time Based Separation at Gatwick, subject to spending limits, airport funding and customer SIP approval.

Extended arrivals management is in place at Heathrow and went live at Gatwick in December 2019. The NATS (En Route) plc price control review (NR23) blended plan contains a proposal to upgrade Arrivals Manager with an Arrivals Streaming capability through Arrivals Manager at suitably equipped airports (Heathrow, Gatwick, and Stansted). Single European Sky Air Traffic Management Research-funded research will determine to what extent this capability could support all UK airports as a Multi-airport Arrivals Streaming Service concept. NR23 also contains a proposal to deploy a suitable means of supporting overseas airports' extended arrivals management procedures.

NR23 also contains provision for making use of Manchester Airport's Arrivals Manager data as part of an extended arrivals management process, assuming that Manchester deploys an Arrivals Manager.

Time Based Separation Pairwise

Time Based Separation is already in place at Heathrow. This is planned to be enhanced to Static Pairwise separation, which is individually tailored to each aircraft type. The project has over €1 million of Single European Sky Air Traffic Management Research 2020 funding.

Time Based Separation Optimised Mixed Mode Gatwick

Optimised Mixed Mode Time Based Separation optimises the spacing between arriving aircraft, while allowing for interleaved departures. The Optimised Mixed Mode+ variant adjusts arrival spacing, while additionally taking account of the type of departing aircraft. This requires additional system and operations inter-operability. NR23 reflects the

agreement with Gatwick, which is to deliver Optimised Mixed Mode Time Based Separation first, followed by Optimised Mixed Mode+ one year later.

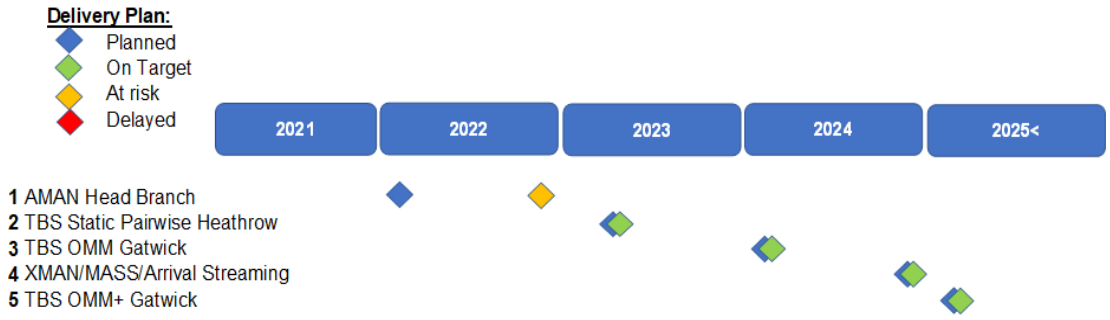
Extended Arrivals Manager, Multi-airport Arrivals Streaming Service & Arrivals Streaming

The concept is based on deployment of arrivals streaming capability, so that pilots can manage their flights, to meet a time-separated target time at the start of systemised airspace. The benefit anticipates increase of the numbers of aircraft that can fly a continuous descent from en-route to the Terminal Manoeuvring Area and reducing stack-holding time. Work is initially primarily Single European Sky Air Traffic Management Research funded and, depending on suitable positive results, will then be deployed by NATS (En Route) plc as individual projects, as described in the NR23 plan.

Key Milestones

NATS (En Route) plc is currently engaging with the industry as part of the NR23 process, which includes the exact scope and planned timescales of deployment for these initiatives.

Below information is indicative and subject to change:



The Heathrow Time Based Separation Pairwise upgrade has undergone several simulations to enable requirements to be finalised; these are expected to be passed to the manufacturer by the start of 2022. The Arrivals Manager arrivals streaming simulation is has taken place in December 2021. Arrivals Manager Head Branch deployment is planned for 2022.

Next Steps

- Continue Heathrow Time Based Separation Pairwise product development
- Get result of Gatwick Time Based Separation mixed mode funding request

Risks

The key risk highlighted by NATS (En Route) plc is the availability of resource, especially engineering, while major Single European Sky Air Traffic Management Research activity is underway in parallel to the planned queue management projects.

Benefits

Deployment of the queue management initiative is expected by NATS (En Route) plc to deliver environmental benefits, associated with cost efficiencies for airspace users. It will maintain and where possible, enhance safety performance and deliver workload efficiencies through a combination of Air Traffic Management System and Airspace Change. Below is a summary of the currently deployed queue management benefits, observed by NATS (En Route) PLC:

Gatwick Extended Arrivals Management

Extended arrivals management and reduced descent speed procedures save airlines 1200 tonnes of fuel annually by transferring 27,000 minutes of delay out of the Terminal Manoeuvring Area.

Heathrow Demand Capacity Balancer

Using Demand Capacity Balancer (instead of normal air traffic control flow regulations), generated 26-41% less pre-departure delay during trials held between April and June 2019. Analytical modelling indicated that stack holding could be reduced by five minutes, as a result of asking long haul aircraft to slightly slow during the entire cruise phase.

Heathrow Extended Arrivals Management

Extended arrivals management and reduced descent speed procedures save airlines 8000 tonnes of fuel annually, by transferring 132,000 minutes of delay out of the Terminal Manoeuvring Area. Higher proportion of heavy, faster aircraft, with routine stack-holding provides a big opportunity to gain benefits of slowdown.

Heathrow Time-Based Separation using NATS (En Route) plc's and Leidos' *Intelligent Approach* the following benefits were noted by NATS (En Route) plc:

- 62% reduction in Arrival delays due headwinds & more stability in landing & flow rates
- 230,000 minutes annual reduction in Heathrow average airborne holding, saving 15,000 tonnes of fuel per annum
- Average landing rate increased by +2 /+4.2 landings/hour & improved consistency of air traffic control spacing
- Arrival spacing savings equivalent to over 30 minutes of extra landings per day
- No tactical flight cancellations due headwinds
- Overall savings (including holding & delay) > €30m p.a.

Expected benefits for the proposed future queue management solutions have been captured by NATS (En Route) plc and communicated as part of their Service and Investment Plan consultation. A summary has been provided by NATS (En Route) plc below:

Time Based Separation Pairwise

Solution will include safety case to reduce Minimum Radar Separation on final approach to realise benefits for all wake pairs. It will also optimise Runway Occupancy Time spacing indications. The benefit is expected to translate into an increased landing capacity, reduced delays and airborne holding and is expected to deliver >30kT CO2 per annum at 2019 traffic levels. Building on the Single European Sky Air Traffic Management Research work, the project will industrialise Pairwise Wake Vortex Separation into Heathrow Time Based Separation, providing increased landing capacity of 1-2 landings per hour, enabling significant fuel/CO2 savings and enhancing airport service resilience.

Time Based Separation Optimised Mixed Mode

The solution is expected to deliver increased landing capacity, reduction in delays and airborne holding. Environmental benefit will be dependent on the degree to which additional capacity is scheduled. Early studies and simulations showed potential for substantial benefits in landing capacity. Optimised Mixed Mode is expected to deliver circa 3 additional landings per hour, with Optimised Mixed Mode+ adding a further one landing per hour.

Extended Arrivals Manager, Multi-airport Arrivals Streaming Service & Arrivals Streaming

Benefits of these solutions are expected to deliver significant fuel/CO2 savings and reduce airborne holding, complexity, and controller workload. It will also enhance capacity and safety and contribute to the wider benefits of the systemised airspace concept. Benefits estimates will be available after the results of the December 2021 simulation.

Risks to benefit realisation	**Score:** 6
That the implementation of multiple arrivals and departures management systems focused on different airports are not integrated effectively at a network level, leading to pinch points & inefficiencies.	(Likelihood:2) * (Severity:3)

Satellite navigation route replication 7 — ACOG and airports

LOWER ALTITUDE

Description: replication of existing arrival and departure routes using Performance-based Navigation concepts

2020 ⬆ **2021**

7.1 Route Upgrades	7.2 New procedures	7.3 Aircraft avionics upgrades
Timescale: by 2030	**Driver:** UK Statutory Instrument / Airspace Modernisation Strategy	
Stage: Delivery	**Mechanism:** Airspace Change Organising Group / Airports	

Scope

The scope of the initiative is based on requirements defined within the International Civil Aviation Organisation (ICAO) Global Air Navigation Plan (GANP) thread on

Improved Arrival and Departure Operations and UK Regulations (EU) 716/2014 and (EU) 2018/1048. The need for further legislations is under consideration with the Department for Transport and industry but does not diminish the commitment to deployment of Performance Based Navigation as a core element of airspace modernisation.

Performance Based Navigation is a concept, providing specifications for area navigation and Required Navigation Performance, which can be applied to an airspace volume, air traffic route or instrument procedure.

The Navigation Specification is one of the components of the Performance Based Navigation concept, where integrity, continuity and accuracy of operational performance is defined, in a particular airspace. Description for achievement of set performance is also included, such as requirements for specific navigation functionalities.

Pilot training and knowledge requirements are also set, along with required operational approvals, dependent on the type of specification. Required Navigation Performance specification requires on-board self-contained performance monitoring and alerting, whereas specification for area navigation does not.

The Navigation Specification will indicate requirements for space- or ground-based navigational aids (Navaid Infrastructure), the availability of which must be considered, to support the navigation application on air traffic services routes, in line with instrument flight procedures.

Key Achievements

NATS (En Route) plc delivered to the Airspace Change Organising Group a Performance Based Navigation Deployment Strategy, to help determine potential delivery within the scope of the FASI Initiatives 4 and 5, feeding into the creation of Iteration 2 of the Masterplan. Sponsors are ready to commence more detailed design development activities, subject to the Masterplan acceptance by the CAA in early 2022. NATS (En Route) plc is investigating how to provide assurance to this work, in support of potentially implementing reduced divergence departures using Performance Based Navigation to facilitate more effective runway utilisation and minimise CO2 emissions.

Risks

The Department for Transport and the CAA are working on a way forward with regards to Performance Based Navigation deployment. Presently the Performance Based Navigation deployment requirements in the UK are based on retained EU law but are under review.

Dependencies

Most airports required to upgrade their arrival and departure routes to Performance Based Navigation will do so as part of the FASI-N and FASI-S programmes.

There is therefore a significant dependency with Initiatives 4 and 5, including the successful co-ordination of the Airspace Change Proposals by Airspace Change Organising Group. There is also dependency on the quality of the Airspace Change Proposals by sponsors, following the CAP1616 process, before submission to the CAA's airspace regulators for a decision. Initiative 7 is also interdependent with the Satellite Navigation Implementation Plan, delivered under Initiative 14.

Benefits

Performance Based Navigation delivers operational benefits of improved safety, access, flight efficiency and capacity, through optimising aircraft routing. With that, it may translate into reduced CO2 emissions and fuel burn efficiencies. Applying the appropriate navigation performance specification can also mitigate against noise-sensitive areas, adding to environmental benefits of the concept.

Risks to benefit realisation	**Score:** 16
It is expected that route replication can be achieved successfully, however not delivering on expected environmental benefits. The need for further UK legislations regarding the European Union Commission Implementing Regulation 2018/1048 is still under consideration with the Department for Transport and industry, which will impact previously anticipated delivery timescales. Furthermore, dependency with Initiatives 4 and 5 may further push the timing of Performance Based Navigation deployment, of which impact cannot be assessed at this stage without an accepted Masterplan.	(Likelihood:4) * (Severity:4)

Satellite navigation route redesign 8 **ACOG and airports**

Description: deployment of new arrival and departure routes using Performance-based Navigation concepts.

2020 → **2021**

8.1 Route Design	8.2 New procedures	8.3 Aircraft avionics upgrades

Timescale: 2030

Driver: UK Statutory Instrument and Airspace Modernisation Strategy

Stage: Delivery

Mechanism: Airspace Change Organising Group / Airports

Most airports requiring new arrival and departure routes designed to Performance Based Navigation standards, will be doing so as part of the FASI-N and FASI-S programmes.

There is therefore a significant dependency with Initiatives 4 and 5, including the successful co-ordination of Airspace Change Proposals by the Airspace Change Organising Group and the quality of the Airspace Change Proposals following the CAP1616 process before submission to the CAA's airspace regulators for a decision. In some circumstances new routes may be more difficult to achieve, and this will be monitored as Airspace Change Proposals progress.

Key achievements, risks and benefits have been captured under Initiative 7, above.

LOWER ALTITUDE

Risks to benefit realisation	**Score:** 16
Design of new routes changes the environmental impact and can provide respite through alternation, however greater requirement for consultation cost and resource may lead to delayed delivery by impacted sponsors.	(Likelihood:4) * (Severity:4)

UNCONTROLLED AIRSPACE

Review of air traffic service provisions in the UK	9	**CAA developing policy**

Description: review of air traffic service provision in the UK to ensure alignment with international standards and interoperability across airspace boundaries.	**2020** →	**2021**
9.1 Define ATS requirements	9.2 ATS framework	9.3 Not applicable
Timescale: 2026	**Driver:** ICAO Standards and Recommended Practices / ICAO Procedures for Air Navigation Services / CAA (Air Navigation) Directions/ Airspace Modernisation Strategy	
Stage: CAA Policy	**Mechanism:** TBC	

Scope

Initiative 9 requires the CAA to review Air Traffic Service (ATS) arrangements in uncontrolled airspace. Specifically, it requires the following:

(a) a review of the ATS arrangements in uncontrolled airspace, which includes achieving compliance and increased alignment with ICAO's provisions on Flight Information Service (FIS), specifically the *Information Thread – Meteorological Information (MET), Digital Aeronautical Information Management (DAIM), Flight & Flow in Collaborative Environment (FICE), System-Wide Information Management (SWIM)*

(b) consideration of the mechanisms and arrangements by which ATS are provided to aircraft in an en-route phase of the flight (currently delivered through the Lower Airspace Radar Service - LARS concept).

Key Milestones

Timescales for this work will now be aligned with the Revised Airspace Modernisation Strategy due for public consultation in Q1 2022 and will form part of the Integration Implementation Plan.

Key Achievements

Flight Information Display (FID), *'Supplementary Instruction CAP 797 SI 2021/03 FISO Manual: Use of ATS Surveillance Systems in Aerodrome Flight Information Service'*[4] was published in December, amending CAP797, to enable the use of FIDs at airfields, were a Flight Information Service Officer (FISO) provides the service.

The work on flight information service is therefore now complete, awaiting the Airspace Modernisation Strategy refresh and work on the lower airspace service replacement, before making any further progress.

Risks

Decisions on Electronic Conspicuity solution may impact timescales for deployment of proposed Flight Information Service procedure and lower airspace service replacement, where flexibility in airspace use is assumed to be required.

Delivery timescales for stakeholder engagement and subsequent deployment will be established through implementation planning activity, which will commence after the publication of the refreshed Airspace Modernisation Strategy in Q4 2022.

Risks to benefit realisation	**Score:** 8
That the funding model required to deliver a service that serves the needs of users will not be possible. Available technology may not fully support developed concepts and procedures.	(Likelihood:2) * (Severity:4)

[4] CAP 797 SI 2021/03 (caa.co.uk)

Airspace classification review 10 **CAA Airspace Classification Team**

UNCONTROLLED AIRSPACE

Description: review of airspace classification to optimise the integration of all classes of aircraft.		**2020** ⬇	**2021**
10.1 Optimised classification	10.2 New procedures	10.3 Electronic Conspicuity	
Timescale: 2025		**Driver:** ICAO Standards and Recommended Practices / ICAO Procedures for Air Navigation Services / CAA (Air Navigation) Directions	
Stage: Delivery		**Mechanism:** Airspace Classification Team	

Scope

The Air Navigation Directions 2017 require the CAA to regularly consider whether airspace classifications should be reviewed; to carry out a review (which includes consultation with airspace users), where we consider a change to classification might be made; and as we consider appropriate, to amend any classification in accordance with the CAP1991 procedure developed and published by the CAA for making such amendments.

Key Achievements

Having engaged with industry stakeholders on developing the options to amend airspace volumes identified in the CAA's December 2019 consultation (CAP1935), the CAA has decided to refresh its approach to the airspace classification task and so will not be taking any volumes forward to amend from the December 2019 consultation.

The CAA has decided to refresh and adopt a regional approach to this workstream, with an expectation to move to the Amend phase for the Cotswold Region in April 2022. More information on this work can be found on a dedicated webpage available here .

2021 highlights of the work are outlined below:

- Production of the Cotswold Regional Report, along with a general stakeholder engagement survey.
- Stakeholder engagement (workshops and briefings) held in September.
- 2019 consultation comments on airspace volumes within active Airspace Change Proposals passed onto relevant sponsors.
- Stakeholder feedback utilised, together with gathered intelligence, to develop an initial plan of volumes.
- Detailed scrutiny of the survey results undertaken and validated with the use of the Analyser tool; discussion on findings with the relevant Airspace Controlling Authorities.

Next Steps

The analysis will inform the development of the CAA's *Initial Plan*, which will:

- Set out which volumes of airspace the CAA believes should progress to the Amend phase.
- Contain an overview of the survey results, the CAA's detailed scrutiny and the Airspace Controlling Authorities' position.
- Propose alternative solutions to identified issues, where reclassification may not be appropriate, proposing for example: education, training, changes to Letters of Agreement and other.
- Detail volumes filtered out of the process and the CAA's rationale behind it.

The CAA will consult on the Initial Plan, to determine the final set of volumes to progress to the amend phase. The CAA will also continue to pass intelligence to other areas of the CAA or Airspace Change Proposal change sponsors, where an alternative, more appropriate process is required to address the issues raised.

Risks and mitigations

Key risks to the delivery of the initiative have been noted by the CAA and outlined below, alongside proposed mitigating actions:

- The designated controlling authority responsible for the airspace volume for which the CAA proposes for classification review, may not have the resources to cooperate, particularly as a result of the ongoing recovery from the COVID-

19 pandemic. To mitigate this risk, the CAA will produce evidence as to why the change is necessary. The CAA will monitor the implementation of the new procedure, in order to identify anything that is blocking progress, and may decide to engage with Government about how to resolve any issues.

- The environmental impacts of a classification change could be uncertain. Removing controlled airspace, for example, effectively opens up that volume of airspace to all flights. If the airspace were previously relatively unused (hence the reclassification), there could potentially be an increase in noise from new low-level traffic. The CAA does not envisage any significant environmental impacts from a classification change, because these would have been filtered out at an earlier stage in the procedure. However, the CAA cannot model the impacts outside controlled airspace and in respect of this procedure, the CAA does not have specific guidance from the Department for Transport on assessing environmental impacts. If the CAA notes a correlation between increased noise complaints and classification amendments, we will advise the Department for Transport, and reflect any policy changes they make in updates to the procedure. As with any change, the designated controlling authority will monitor its implementation and after one year the CAA will report on the effectiveness of the change and whether any further action is needed.

Risks to benefit realisation:	**Score:** 9
Risk to be further defined as part of the Initial Plan development stage, relevant to the Cotswold Region.	(Likelihood:3) * (Severity:3)

Deployment of electronic surveillance solutions 11 CAA developing policy

UNCONTROLLED AIRSPACE

Description: deployment of electronic surveillance solutions to aircraft and at airports to aid integration of traffic.

2020 ⬇ **2021**

11.1 New airspace structures	11.2 New procedures	11.3 Electronic Conspicuity

Timescale: 2024	**Driver:** UK Statutory Instrument / Airspace Modernisation Strategy / Safe and Efficient Airspace / Integration of new airspace users
Stage: CAA policy	**Mechanism:** TBC

Scope

The CAA is developing a strategy to determine how Electronic Conspicuity can play as an enabler in addressing integration of existing and new users of UK airspace. This work is a key enabler for Initiatives 9 and 10 and builds on the work undertaken by the CAA and the inputs from a cross section of stakeholders via a Call for Evidence[4], focusing on the technical solution required to progress.

Electronic Conspicuity is an umbrella term for the technology that can help pilots, remotely piloted aircraft users and air traffic services to be more aware of what is operating in surrounding airspace. The transmission of Electronic Conspicuity data will be used by ground-based services, to enable delivery of Flight Information Services and the implementation of more flexible controlled airspace structures. The information generated and depending on the integrity and accuracy of the data, can be presented to pilots and air traffic services visually, audibly, or both, to provide them with information on other traffic nearby. This strengthens the 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 to be using compatible Electronic Conspicuity devices, for detection purposes.

Many airspace users (with aircraft weighing more than 5700kg), are legally required to transmit Electronic Conspicuity information using Automatic Dependent Surveillance–Broadcast Out transponders, under UK Regulation (EU) 1207/2011.

[4] CAP1837: Response to CAP 1776 Electronic Conspicuity - a call for evidence and future plans - including views gathered at the Share the Air Conference (June 2019)

Key Achievements

The CAA has reached an agreement with the Department for Transport regarding Electronic Conspicuity and established a Surveillance Task Force, to develop air and ground standards/specifications for Electronic Conspicuity. These specifications will provide clear guidance to all airspace users and service providers to achieve interoperability between systems, enabling information to be shared accurately and reliably and promoting safe integration and growth. The initial meeting was held in November, with representation from across the CAA, Department for Transport, avionics manufacturers and experts in air navigation service provision. The initial activity consists of establishing a Concept of Operations for Electronic Conspicuity, based on requirements focusing on airspace access and Beyond Visual Line of Sight Remotely Piloted Aircraft Systems integration.

The adoption of Electronic Conspicuity specifications will not be mandated UK-wide. Users of other systems can continue to benefit from the functionality that those products offer. However, compliance with the established Electronic Conspicuity specifications will be required in some areas to ensure safety and interoperability between airspace users.

Some users of airspace may need to adopt new equipment or adapt existing devices to meet the new specifications. The CAA will set out more details in due course about support, to help manufacturers and airspace users make those changes.

Next Steps

With the Department for Transport-funded body of work, the CAA is now engaging with third-party suppliers and have launched a tender process for the development of Concept of Operation for Electronic Conspicuity future state and regulatory framework. The Surveillance Task Force will continue its activity and oversee the development of this work, which will be conducted in three phases.

The initial assessment of the current environment (Phase 1) is planned for delivery in February, with the definition of the future state (Phase 2) planned for April 2022. At Phase 3, the CAA plans to deliver a set of recommendations for Department for

Transport's approval in Spring 2022. The infrastructure change stage will follow, with a target delivery date of end 2024.

The CAA will also develop a Stakeholder Engagement Plan to include all entities enlisted within the Airspace Modernisation Strategy Governance Structure.

Benefits

Electronic Conspicuity will play a vital enabling role in the Airspace Modernisation Strategy. The solution is seen as an enabler to the on-going modernisation of the UK's airspace structure and route network. It is expected to enable safe and efficient integration of remotely piloted aircraft whilst providing accurate data to ground systems enabling greater flexibility in airspace use.

Risks

Because the availability of the protected portion of radio frequency spectrum, used by aviation stakeholders to transmit Automatic Dependent Surveillance–Broadcast (1090Mhz) is limited, there is a risk that the general Electronic Conspicuity equipage use creates a surge in demand for spectrum, that cannot be accommodated. This may lead to gaps in the ability to create a full known environment, as the spectrum becomes saturated.

The Remotely Piloted Aircraft Systems integration risk is closely related to the spectrum supply risk. Given the potential high demand from the Remotely Piloted Aircraft Systems sector and the finite amount of spectrum resource, the CAA is observing international developments in this area and is working closely with Ofcom, under Initiative 12, to mitigate the risk and find an optimum general equipage mandate solution.

Risks to benefit realisation	**Score:** 9
That the adoption of electronic surveillance solutions on board aircraft and on the ground at airports is not considered commercially viable and competitive.	(Likelihood: 3) * (Severity:3)

Efficient use of radio frequency spectrum 12 — **CAA and Ofcom**

COMMS AND ATM INFRASTRUCTURE

Description: cross-industry plan for the efficient use of radio-frequency spectrum to support growing demand from aviation.		**2020** ➡	**2021**
12.1 Airspace structures	12.2 New procedures	12.3 Develop standards	
Timescale: ongoing		**Driver:** UK Statutory Instrument / Airspace Modernisation Strategy	
Stage: Delivery		**Mechanism:** CAA / Ofcom	

Scope

Communications (including datalinks), Navigation (terrestrial and space-based) and Surveillance (primary, secondary and ADS-B) all require appropriate radio spectrum to operate safely and efficiently.

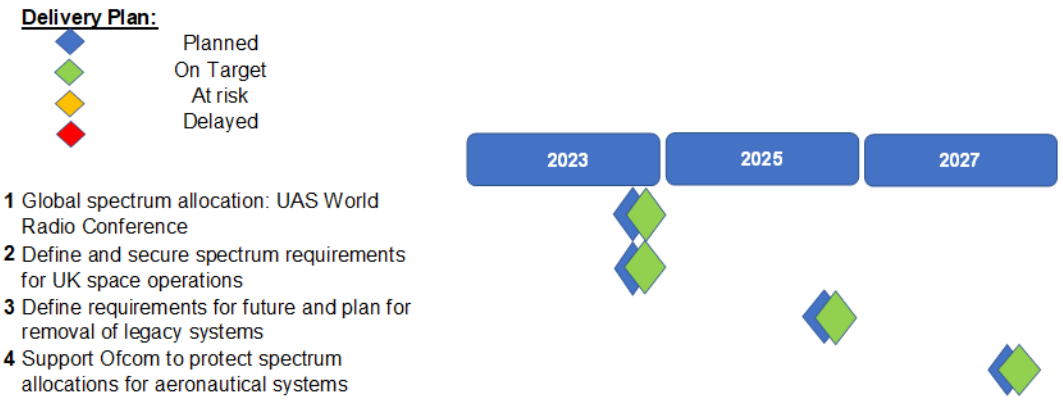
At a global level, the United Nation's International Telecommunications Union manages the Radio Regulations, which are the international treaty, governing the global and regional use of radio-spectrum and satellite orbits.

The treaty can only be amended through a World Radiocommunication Conference (WRC), which will next occur in 2023. There are six items on the agenda where aviation is seeking action to enhance its use of spectrum, with a further ten, that aviation needs to watch, as they could potentially adversely impact aviation's access to spectrum.

Within the UK spectrum, assignments are licensed by Ofcom, the telecommunications regulator.

Key Milestones

The key milestones for Initiative 12 are mainly driven outside the aviation sector, by the work of radio regulators, tabled at the Spectrum Implementation Group. The following key dates are therefore observed:



Key Achievements

An ongoing trial of 978MHz covering Beyond Visual Line of Sight operations and provision of Traffic Information Service from ground to air is taking place, led by uAvoinx and Trax International at Goodwood. Outcome report is expected to be delivered to the CAA in the early months of 2022.

In 2020 the Radio Technical Commission for Aeronautics (RTCA) published a report on the "Assessment of C-Band Mobile Telecommunications Interference Impact on Low Range Radar Altimeter Operations" which highlighted a risk of interference from 5G base stations to radio altimeters. The Report left a number of questions unanswered due to the anonymisation of the results. The CAA have been working with the Ministry of Defence and Ofcom to understand the implications for the UK and UK-registered aircraft flying abroad. A test programme led by the Ministry of Defence is currently being undertaken. Of the three civil radio altimeters being tested, two have now completed testing and the results are being analysed. Additionally, the CAA are involved with work at the global and regional level within aviation and the radio regulatory community. Indications are that some radio altimeter designs may not have considered the potential for the introduction of high-powered systems in the frequency band below that used by radio altimeters when

they were designed. Manufacturers have indicated that if a retrofit programme were needed then that may take until 2030 to complete

Risks

The CAA has identified a risk that if manufactures are unwilling to release the data on performance of individual radio altimeter models, then the retrofit programme may need to be more extensive and further testing may be required at a CAA or Department for Transport cost.

The CAA recognises potential issues with timely and precise definition of remotely piloted aircraft and UK space requirements, along with operational and safety risks identified and requiring mitigation, due to non-aeronautical system (wireless microphones), allocated by the radio regulator within in the frequency band used by aviation.

It is also recognised that the World Radio Conference 2023 date may be shifted, due to the extended travel restrictions because of COVID-19 and logistics around remote participation on such a large, global scale of stakeholders.

Benefits

The main objective is to provide airspace users with safe, reliable, and interoperable operational environment, the benefits therefore translate into greater capacity of a globally finite radio spectrum resource. Initiative 12 is therefore expected to deliver benefits, by:

- enabling single, unified airspace management,
- enabling Communications, Navigation and Surveillance functions in an integrated system, whilst ensuring adequate redundancy,
- addressing radio frequency capacity issue, protection, resilience, efficiency, and compatibility,
- ensuring spectrum utilization meets radio regulations,
- maintaining sufficient and suitable spectrum for aviation needs.

Risks to benefit realisation	**Score:** 12
Lack of sufficient, suitably assigned, and protected spectrum will constrain the widespread adoption of new technologies and procedures, designed to improve airspace safety, efficiency, and capacity. The situation is exacerbated by aviation's current in-	(Likelihood:3) * (Severity:4)

	efficient use of the spectrum resources it already has access to, which could potentially be available to support all future requirements and minimize the risk.	

Full adoption of datalink communications **13** Virtual datalink groups of CAA, NATS and airlines

COMMS AND ATM INFRASTRUCTURE

Description: cross-industry plan for the full adoption of datalink communications.		**2020** ➡	**2021**
13.1 Not applicable	13.2 New procedures	13.3 Develop standards	
Timescale: by 2035	**Driver:** UK Statutory Instrument / Airspace Modernisation Strategy		
Stage: Delivery	**Mechanism:** CAA, NATS (En Route) plc and UK Airlines		

Scope

Datalink refers to a system of text message transmission between the aircraft and ground. Controller–pilot datalink communications allow certain non-urgent air traffic control messages to be communicated via text message, rather than voice.

The deployment and use of datalink forms part of the Euro control Operational Excellence Programme aimed at fully re-invigorating the use of datalink and to realise the benefits of an operational datalink service.

UK Regulation (EU) 29/2009 on datalink services, applies to all flights operating as general air traffic, in accordance with instrument flight rules in all airspace above FL285, with some exceptions.

In 1983 ICAO began an effort to establish a datalink architecture under its Future Air Navigation System structure. This advance became the architecture and protocol

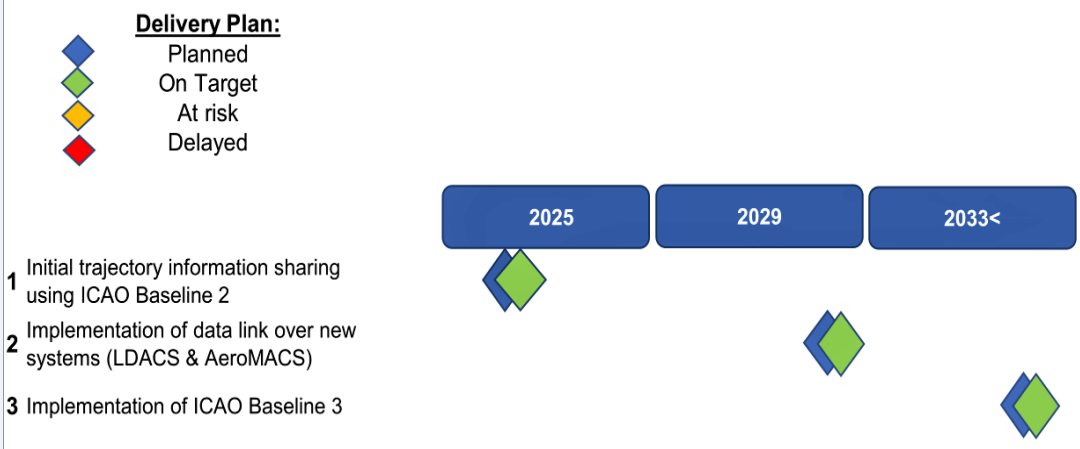
standard of an oceanic communications network. ICAO have developed Future Air Navigation System structure to different baseline standards. 'Baseline 2' includes advanced services such as:

- 4D Trajectory Negotiation & Synchronization
- Flight deck-Based Interval Management (aircraft spacing)
- Taxi Clearance
- Hazardous Weather Reporting
- Runway Visual Range
- Operational Terminal Information.

'Baseline 3' will drive performance improvements to enable a global airborne network for air traffic control and related services, that uses multiple down-links to the ground network.

Key Milestones

Activities under the Operational Excellence Programme Work Stream 12.1 are progressing as planned, with a view to increasing the datalink message set to enhance operations. Future delivery plans linked to Baseline 2 and 3 deployment remain unchanged and on track, as shown below:



Risks

Although the target of 75% equipage datalink capability is being met, only 50% of flights are using Controller–Pilot datalink communications. Despite lower-than expected data and aircraft traffic levels, as a result of COVID-19, performance issues

related to particular aircraft datalink equipment and frequency management (congestion) were noted by the CAA as evident. Actions to address these issues are currently being investigated, although negotiations on the exact allocations and use to ease the congestion have slowed. Work on international agreements will be proposed for agreed regarding frequency use.

Promotion of UK engagement within the European Union datalink improvement activities is ongoing, with a view of increasing the datalink message set to enhance operations.

Dependencies

There is a strong link between datalink services and trajectory information sharing and dependency exists with deployment of System Wide Information Management under Initiative 15. The ability to move to full Trajectory Based Operation in a collaborative environment, strongly depends on simultaneous sharing of the full range of aeronautical and meteorological information between airspace users, to provide a similar picture of the operational environment to all.

Benefits

Datalink use is not universal, but the benefits are being seen where it is deployed, and greater utilisation is being encouraged. More controllers are seeing the benefits of using both datalink and voice messaging to reduce workload and ambiguity in communication, thereby reducing safety risk.

The use of Controller–Pilot datalink communications messages provide several advantages over traditional voice communications. Datalink also plays a central role in the implementation of trajectory-based operations. Text-based messages reduce the margin for error due to a poor voice radio connection and they liberate space on the congested Very High Frequency channels for more urgent voice communications.

Datalink therefore delivers operational benefits, reducing controller workload and frequency congestion, and increase efficiency and awareness in the cockpit.

Risks to benefit realisation	**Score:** 9 (Likelihood:3) * (Severity:3)

	That a lack of co-ordination in the adoption of datalink solutions across airports, aircraft operators and air traffic control will reduce the benefits of the technology.	

COMMS AND ATM INFRASTRUCTURE

Satellite navigation implementation plan **14** **ACOG and ANSPs**

Description: a national infrastructure plan for CNS, that includes the retention of sufficient ground navigation aids, communications, and surveillance capability to ensure the continued provision of air services in contingency.

2020 ⬆ **2021**

14.1 National standards Airspace Structures and Routes	14.2 National standards Air Traffic Management Procedures	14.3 Rationalise ground infrastructure
Timescale: 2030	**Driver:** UK Statutory Instrument / Airspace Modernisation Strategy	
Stage: Delivery	**Mechanism:** Airspace Change Organising Group / Air Navigation Service Providers	

Scope

The need for further legislation regarding Performance Based Navigation is under consideration with the Department for Transport and industry, but it does not diminish the commitment to deployment as a core element of airspace modernisation, the introduction of three-dimensional Performance Based Navigation instrument approach procedures, Standard Instrument Departure Routes, Standard Terminal Arrival Routes, and the application of Performance Based Navigation on air traffic service routes.

It also envisages placing airspace usage requirements on rotorcraft operations and all providers of Air Traffic Management/Air Navigation Services, including aerodromes, to present Performance Based Navigation Transition Plans to the CAA.

The necessity for contingency measures drives the scope of this initiative, to ensure continuity through other means where, for unexpected reasons beyond their control, Global Navigation Satellite System or other methods used for performance-based navigation are no longer available. This may require retention of a network of conventional navigation aids and related surveillance and communication infrastructure.

Key achievements and current risks have been captured under Initiative 7 above, with dependencies on Initiative 8 and 12.

Risks to benefit realisation	**Score:** 16
Rationalisation of conventional navigation aids will be complex, as there needs to be appropriate contingency, particularly due to potential interference threats such as space, weather or jamming trials.	(Likelihood:4) * (Severity:4)

Air traffic management 15 **NERL's SIP for ATM, AIS part. Met Office part with CAA.**

COMMS AND ATM INFRASTRUCTURE

Description: air traffic management to modernise systems, tools, and procedures.	**2020** ⬆ **2021**	
15.1 Not applicable	15.2 New procedures	15.3 New systems and tools
Timescale: by 2035	**Driver:** UK Statutory Instrument / Airspace Modernisation Strategy	
Stage: Delivery	**Mechanism:** NATS (En Route) plc Service and Investment Plan/ Met Office via CAA	

Scope

Initiative 15 in the Airspace Modernisation Strategy sets out the requirement for the modernisation of air traffic management systems, tools, and procedures. Part of this work is to implement modern data exchange and sharing services, that will allow the efficient communication of flight, meteorological and aeronautical information to operational stakeholders, using new air traffic management systems and tools on the ground and in the air.

Much of this work has been set out in ICAO GANP *Information Thread – MET, DAIM, FICE, SWIM* and UK Regulation (EU) 716/2014.

ICAO Information Management (IMP) and Meteorology (METP) Panels are responsible for timely delivery of the provisions, supporting implementation of the GANP, which provides Aviation System Block Upgrades (ASBU), Modules and Roadmaps. ASBU framework defines six-year timeframes and deadlines for each block, to be available for implementation.

Key Milestones

AIM- and MET- related activities are planned in three main ASBUs, with key target dates provided below:

- DAIM – Digital Aeronautical Information Management – Blocks 1 & 2
- SWIM – System Wide Information Management – Blocks 2 & 3
- AMET – Meteorological information – Blocks 0 – 4

The Air Traffic Management activities envisage for deployment are:

- iTEC - Flight and Radar Data Processing tool
- Foursight – an aircraft trajectory prediction (conflict detection) system
- Main and Second Voice - (Communication) systems

NATS (En Route) plc's planning for the deployment of Voice and En Route systems have been revised in the light of COVID-19. The aim is deployment of a common platform, providing mutual system contingency and resolution of legacy issues from National Airspace System/National Air Traffic Operational Display Equipment. Originally envisaged work for 2021 has not been achieved, iTEC and the deployment

of tools in lower airspace has been postponed for now with further activities on iTEC being a core activity in the NR23 planning.

The first Limited Operational Shadowing activity using the DP-En Route Core Strategic Architecture took place in November. This saw controllers using the DP_ER system to shadow live operations in Prestwick Upper airspace for a short period of time with valuable information being obtained to inform future such activities.

Deployment of the next version of ITEC V3, is currently entering the requirements definition phase which will last through to Spring 2023. This is the period where the functional (ATC capabilities) and non-functional requirements needed in the early ITEC V3 builds will be defined. They will include requirements to support deployment into the NERL's lower operations (Prestwick Lower and Terminal Control operations) later this decade which will enable the roll out of a common Flight Data Processor and Common Workstation across all NERL centres.

The CAA and the Met Office will jointly lead on policy and report on progress, once the scope and requirements have been established. NATS (En Route) plc and Met Office will lead on deliverables once requirements are known.

Significant work is underway and planned that will support Initiative 15 (and other Initiatives) but there are currently no specific deliverables or requirements that have been identified and can be reported on.

Risks

The following risks have been identified by the CAA and NATS (En Route) plc, with regards to deployment of scope under the initiative. Those are presented below:

- Financial pressure due to the impacts of COVID-19 may lead to re-prioritization of projects, where some elements of the initiative may not be delivered or delivered at timescales significantly different to estimated deployment.

- Resource availability within the CAA's Aeronautical Information Management & Meteorological Information team, and NATS (En Route) plc project teams may increase reliance on third party contractors for delivery, impacting planned timescales.

- Lack of clarity and consistency between users and industry requirements, along with NR23 planning and re-prioritization may cause a disconnect between what the industry expects and what is delivered in the short-term.

- Concern that work is progressed either to Initiative 15 or other Initiatives that is dependent on AIM or MET deliverables, which is not identified sufficiently early in the workflow of the project.

Dependencies

Successful deployment of Initiative 15 impacts delivery of the performance-based navigation concept, under Initiatives 7 and 8, and supports delivery of Initiative 9 - Review of Air Traffic Service Provision in the UK, which relies on timely deployment of System Wide Information Management. Deployment of Electronic Conspicuity under Initiative 11 on the other hand, enables technical integration of solutions, delivered under Initiative 15 workstreams.

Initiative 15 is also an enabler, and partially addressed requirements under Initiative 12, whilst benefit realisation of System Wide Information Management is inter-dependent on deployment of datalink solution, under Initiative 13.

Dependencies have been noted on successful development of new user requirements, in line with innovation, and establishing an alignment point, especially in the areas of Remotely Piloted Aerial Systems and Space flights.

Global dependency is also of importance, which is based on industry's readiness to implement change and requirement for harmonisation across all international stakeholders.

Benefits

The air traffic management system is increasingly reliant on accurate and timely information. Such information must be organised and provided by solutions that support system wide interoperability and secured seamless information access and exchange.

Global improvements in information management are needed and the implementation of the System Wide Information Management should ensure

delivery of the right information, to the right people at the right time, in an interoperable manner that meets the appropriate quality standards.

There are a number of benefits achieved through the modernisation of air traffic management systems, tools, and procedures, especially through the application of System Wide Information Management, such as:

- improved safety by providing the capability to receive relevant information in timely and effective manner,
- improved efficiency by enabling performance-based operations and by transitioning to a service orientated environment,
- improved collaborative-decision making by all stakeholders through the access to quality data including dynamic data, and improved exchange of information,
- improved air traffic management performance and increased capacity.

This initiative will also provide improved access to increasing amounts of high quality, high detail, and globally available MET data, in line with the System Wide Information Management. This is required by a variety of aviation stakeholders and by concepts and activities, such as performance-based navigation, flight planning, continuous descent operations and continuous climb operations. This will help to improve the efficiency, performance, and safety of operations, whilst minimising environmental impacts.

Risks to benefit realisation	**Score:** 16
That the requirements to change the airspace and upgrade air traffic management systems, tools and procedures in the same timeframe creates complex interdependencies that require significant resources, funding, and additional development time to resolve.	(Likelihood:4) * (Severity:4)

Chapter 2

Co-Sponsor Updates

The Role of the Co-Sponsors: Policy & Regulation

Airspace Modernisation Co-Sponsors

2.1 The Department for Transport and the CAA act as Co-Sponsors for airspace modernisation. The Department for Transport is accountable for national policy on airspace, and the CAA for the strategy. Whilst these accountabilities are distinct, they act as Co-Sponsors together to ensure alignment. Together, the Department for Transport and the CAA commission specific projects, necessary for airspace modernisation, including the delivery of the Initiatives set out in 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 with any contingencies made explicit. It must be noted however, that whilst in some cases delivery of Initiatives is a matter of law, for others delivery depends on the voluntary participation of delivery groups. In such cases, the confidence of delivery is dependent on the benefits and delivery bandwith that organisations can commit to.

2.2 The Co-Sponsors agree deliverables and outcomes and set parameters for delivery groups tasked with planning and delivering modernisation projects and Airspace Modernisation Strategy Initiatives.

2.3 The expectation of the Co-Sponsors is that progress of the commissioned projects is monitored and reported on by theCAA's Airspace Modernisation Oversight Team, further described in the section below. The Co-Sponsors will be the point of escalation on delivery issues, communicated by the Oversight Team, and will jointly consider when and how to intervene. Further detail on the Co-Sponsors role is set out in the annex on governance, that was initially published alongside the Airspace Modernisation Strategy in December 2018 and updated in the December 2019 Airspace Modernisation Progress Report (CAP1862). The governance annex will be updated as part of the Airspace Modernisation Strategy Refresh activity, described later in this chapter.

Delivery, Monitoring and Oversight

2.4 Reporting into the Co-Sponsors, the CAA's delivery, monitoring and oversight role is carried out by the Oversight team in the Strategy and Policy Department. The key function of the team is to oversee, track and regularly report on the Airspace Modernisation Strategy Initiatives' delivery to the Co-Sponsors and annually to the Secretary of State.

2.5 The team consists of the Head of Airspace Modernisation Oversight and an Airspace Modernisation Oversight Associate. In 2021 the team has expanded by making new appointments, one for the role of another Associate and one for a newly created role of an Airspace Modernisation Oversight Principal.

2.6 The Oversight team is also responsible for administering and managing the Future Airspace Strategy Implementation (FASI) Programme Funding Support Package, on behalf of the Department for Transport and will provide an Advisory Board function within the governance structure of the Airspace Modernisation Strategy Support Fund. The scope and progress of both funds is described in more detail later on in this chapter.

2.7 The Oversight Team will also have a key role to play in problem solving modernisation delivery and advising on the potential use of powers, to direct sponsors to prepare and submit airspace changes that are required as part of the CAA's strategy and plan, under the Air Traffic Management and Unmanned Aircraft Act 2021, further described in this chapter.

Airspace Modernisation Strategy Refresh

Introduction

2.8 The Airspace Modernisation Strategy sets out what airspace modernisation must achieve and how it will happen. When we first published the Airspace Modernisation Strategy in December 2018, we intended to review it in 2020 to make sure it responded to any policy changes brought about in the Department for Transport's Aviation Strategy, the subject of a 2018 Green Paper (in particular policy changes on managing aviation noise), and to build upon the existing strategy. We also recognised that the Airspace Modernisation Strategy would need to be updated in order to meet the Government's specified timescale of a

strategy, covering the period out to 2040. The refresh activity commenced in the final months of 2020, due to the uncertainty of the changing context for aviation, brought about by the COVID-19 pandemic.

2.9 While the Aviation Strategy has not yet been finalised, the context for aviation has changed since the initial Airspace Modernisation Strategy publication in the following areas:

- **demand for air travel**, a key driver for airspace modernisation, has collapsed because of COVID-19, resulting in many industry modernisation initiatives being paused; but the number of flights in UK airspace is forecasted, by the Airspace Change Organising Group to recover to 2019 levels by 2025 and to continue growing (assuming unconstrained demand), at around 1.5% per annum;

- **Heathrow** airspace modernisation plans – another key driver – have restarted but based on a two-runway operation, with the three-runway plans on hold for now; interdependencies at the system level means there are knock-on implications to modernisation of lower airspace in the south-east generally;

- **decarbonisation**: in July the Government consulted on Jet Zero, outlining its vision for the aviation sector to reach net zero by 2050. In October 2021, alongside its Net Zero Strategy[5] the Government reiterated its support for aviation as a social and economic good and stated its belief[6] that the aviation sector, even if returning to a pre-COVID-19 demand trajectory, could achieve net zero without the Government needing to intervene directly to limit aviation growth;

- **European Union withdrawal / alignment with ICAO**: Prior to leaving the EU, the UK's obligations under the Global Air Navigation Plan (GANP), which is ICAO's strategy that drives evolution of the global air navigation system, was delivered through the Single European Sky, and associated Master Plan, which is used to produce the necessary regulations regarding airspace modernisation which had direct effect in the UK. While some of this legislation has been retained as domestic law and continues to apply in the

[5] *Net Zero Strategy: Build Back Greener*, HMG, October 2021.

[6] Government response to the Climate Change Committee's 2021 report *Progress in Reducing Emissions*

UK. The UK Airspace Modernisation Strategy Refresh will provide the basis of our alignment with the ICAO GANP, using the framework of the Airspace System Block Upgrades (ASBU) to guide modernisation activities, whilst ensuring it is relevant to UK operations. The UK's ongoing membership and active engagement within the inter-governmental organisation EUROCONTROL, facilitates significant access to planning, designing, implementing and monitoring of the architechture and operation of the pan-Europen ATM Network.

- **Aviation innovation:** Air traffic management of demand for airspace access is setting some significant challenges globally, including in the UK. The advent of new users such as drones, urban air mobility, high-altitude operations (e.g. telecoms platforms) and space launches, in addition to existing user demand from commercial flights, the military and General Aviation, will require significant change to UK air traffic management and airspace use. The refresh of the Airspace Modernisation Strategy will therefore aim to introduce new areas of focus to the strategy, both near and longer-term, updating existing elements as necessary, as well as informing the creation of a 2040 vision. This will help fulfil our strategic vision and objectives for airspace modernisation, which we aim to re-express to better reflect the latest context, while remaining derived from our duties under Section 70 of The Transport Act 2000, Government policy and international obligations**.**

Communication & Engagement

2.10 The Air Navigation Directions 2017 require the CAA to consult the Secretary of State in relation to preparing and maintaining the Airspace Modernisation Strategy. With that in mind, the CAA published CAP2175 Airspace Modernisation Strategy Review 2021 Stakeholder Engagement Plan and Process[7] to outline our approach on how we intend to better reflect the priorities of all stakeholder and interest groups in the production of a refreshed draft of the Airspace Modernisation Strategy, ahead of the public consultation period.

2.11 The work on the Airspace Modernisation Strategy Refresh commenced in November 2020 with listening sessions. Aiming to engage with a wide range of

7 CAP2175 Airspace Modernisation Strategy Review 2021 Stakeholder Engagement Plan and Process

stakeholders, the sessions were attended by key stakeholder groups listed within the Airspace Modernisation Strategy governance structure.

2.12 Since then, and to help inform the content and strategic direction of the Airspace Modernisation Strategy refresh, we have engaged extensively with over one hundred individuals, representing those using or impacted by the use of UK airspace and with an interest in modernisation. We asked for views on which of the 15 Initiatives of the existing Airspace Modernisation Strategy remain important and which could be improved, and where there are gaps – either something not addressed in 2018 or that has arisen since, like the impact of COVID-19. Our engagement then focused on identifying what the strategic aims or 'ends' of modernisation were, both short term and as part of a longer 2040 vision. With a subset of the wider group we then held 'co-creation' workshops on how to achieve those 'ends', with a separate review group to critique how we were interpreting the outputs.

2.13 We have shared the outputs with the whole group in as transparent a way as possible, taking on board comments where we can, while signalling the forthcoming formal consultation. We also made clear where some points raised are out of scope, for example matters of Government policy over which the CAA has no control, or where they concerned our CAP 1616 airspace change process, which is subject to a separate ongoing review[8].

2.14 A summary of the Airspace Modernisation Strategy Refresh engagement activity has been presented in Table 2.1.

Table 2.1: Airspace Modernisation Strategy Refresh 2021 – Summary of Stakeholder Engagement Activity

Session Type	Date	Description
Listening sessions	November and December 2020	The CAA held five listening sessions with airspace stakeholders to hear about issues they considered were not addressed in the 2018 Airspace Modernisation Strategy or had arisen since its publication. Not everything raised was within the remit of the CAA or the

8 UK CAA seeks views on airspace change process | UK CAA (caa.co.uk)

		Airspace Modernisation Strategy, for example issues concerning Government policy (such as the trade-off between facilitating growth and minimising environmental impact) or comments on the CAA's CAP 1616 airspace change process (which is currently subject to a separate CAA review).
Feedback/ playback sessions	March 2021	At these sessions we played back to stakeholders what we had heard from them during the listening sessions. Further discussion included a stakeholder desire to enhance and add to several of the 'ends' (objectives) in the Airspace Modernisation Strategy, e.g., new areas of focus on the wants and needs of users outside controlled airspace.
CAA Airspace Modernisation Strategy stakeholder engagement plan	Published June 2021	For transparency, we published our stakeholder engagement plan.
Requirements gathering sessions	June and July 2021	Eight requirements-gathering sessions focused on understanding what stakeholders need from a modernised airspace – the strategic aims or 'ends'. Both those deliverables in the short term, and future needs and aspirations long term.
Co-creation workshops A subset of 12 expert representative stakeholders	July and August 2021	These four workshops, limited to around twenty external participants to keep them manageable and workable, considered the Initiatives that would aim to meet these strategic 'ends'. The outputs were filtered into material that could be included in a formal public consultation. Although some rationalisation of existing Initiatives might be needed, we committed that no changes would be made that could undermine modernisation activity already underway.

Airspace Modernisation Strategy Review Group A subset of 12 expert representative stakeholders	August 2021 and ongoing	The Airspace Modernisation Strategy Review Group was also limited to around twenty participants (a different subset of the wider group from the co-creation workshops to maximise the number of different individuals engaged). The group provides a critique of how we have interpreted, and intend to represent in the Airspace Modernisation Strategy, the information collected from the requirements sessions and co-creation workshops. As this has been generally well received by stakeholders, subject to formal consultation on the Airspace Modernisation Strategy governance structure, we propose continued use of this group in some form during the ongoing development of the Airspace Modernisation Strategy.
Progress update sessions	October 2021 and ongoing	These sessions update the wider group on progress and our envisaged timeline for formal consultation and publication of a revised Airspace Modernisation Strategy.
Public consultation	Planned for January 2022	A public consultation seeking stakeholder views on our proposals for a revised Airspace Modernisation Strategy, including the draft text of a strategy and plan where we have firm proposals.

Next Steps

2.15 In January we plan to launch a twelve-week public consultation on the content of a revised Airspace Modernisation Strategy and seeking views on whether any changes are needed to the Airspace Modernisation Strategy governance structure.

2.16 Once the public consultation is concluded, we will incorporate received feedback into the final versions of the Airspace Modernisation Strategy. This activity will be supported by appropriate stakeholder engagement, and formal consultation with the Secretary of State.

2.17 Following on from that we will continue development of required delivery plans**,** in conjunction with relevant stakeholders, while continuing to oversee and report on the progress.

2.18 In order to ensure consistency in communication and engagement, taking on board the feedback received last year, we are also in a process of overhauling the CAA's Airspace Modernisation Strategy webpages, to include further content, such as our oversight work and the Masterplan acceptance detail.

Criteria for accepting the airspace change Masterplan into the Airspace Modernisation Strategy

2.19 The CAA and the Department for Transport, as Co-Sponsors of airspace modernisation in the UK, commissioned NATS (En Route) plc to create the airspace change Masterplan – a single coordinated implementation plan for airspace changes in the UK to cover the period to 2040. Given the large number of parties involved in the development of the masterplan, including many airports and NATS (En Route) plc itself, the co-sponsors required NATS (En Route) plc to set up a separate and impartial body to develop the masterplan. This body is known as the Airspace Change Organising Group.

2.20 Initially the Masterplan commission was in respect of airspace in Southern England, but in May 2021 this was extended to cover all of the UK, thus encompassing the FASI-South and FASI-North programmes[9] (Initiatives 4 and 5 of the Airspace Modernisation Strategy) redesigning the existing airspace structure. The FASI-South airspace change programme is particularly complex because of the number of interdependent changes necessary to achieve modernisation in the south of the UK.

2.21 The Co-Sponsors assess Airspace Change Organising Group's progress to confirm that the Masterplan is consistent with the published criteria, Government policy and the CAA's own statutory airspace functions. Based on that assessment, and before the Masterplan can be implemented, the CAA must decide to formally 'accept' the Masterplan into our Airspace Modernisation Strategy, having consulted the Secretary of State. Once accepted, this makes the Masterplan, together with CAP 1616, the legal basis against which individual airspace change

9 20210512 CIVIL AVIATION AUTHORITY AND DEPARTMENT FOR TRANSPORT TO NATS (En Route) PLC_COMMISSION_UPDATE.pdf

decisions are made by the CAA. The Airspace Change Organising Group envisages a minimum of four iterations of the Masterplan.

2.22 On 27 August 2021 the CAA published a suite of documents comprising of:

- the criteria for accepting each of the future iterations of the Masterplan into the Airspace Modernisation Strategy (CAP 2156a)
- the supporting assessment framework (CAP 2156b)
- a short summary of opportunities for stakeholders to engage in development of the Masterplan and constituent airspace change proposals (CAP 2156c)
- how we considered responses to the public engagement exercise that we ran in early 2020 (CAP 2157).

2.23 Airspace Change Organising Group submitted Iteration 2 of the Masterplan to the CAA in December 2021, for acceptance into the Airspace Modernisation Strategy. After having consulted the Secretary of State, the CAA expects to make its decision in the early months of 2022.

Air Traffic Management and Unmanned Aircraft Act 2021

2.24 Historically, neither the Government nor the CAA have had the powers to guarantee or compel that airspace change, as part of a wider modernisation programme is taken forward. To address this issue and following consultation[10] the Government introduced the Air Traffic Management and Unmanned Aircraft Bill into Parliament. The Bill received Royal Assent on 29 April 2021 and is cited as the Air Traffic Management and Unmanned Aircraft Act 2021.

2.25 Part 1 of the ATMUA Act 2021 relates to Airspace Change Proposals and contains powers for the Secretary of State[11] to direct "*a person involved in airspace change*" to progress or cooperate in an Airspace Change Proposal. Such persons are air navigation service providers, airports and other persons with functions relating to

10 Department for Transport: Consultation Response on Legislation for Enforcing the Development of Airspace Change Proposals, October 2019 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/841247/consultation-response-on-legislation-for-enforcing-the-development-of-airspace-change-proposals.pdf

11 The Secretary of State may also delegate certain functions to the CAA by giving a notice to the CAA.

air navigation. When determining whether to use the power, the Secretary of State would consider advice from the CAA. This advice would need to take account of the extent to which the Airspace Change Proposal would assist in the delivery of the Airspace Modernisation Strategy.

2.26 Should the Secretary of State issue a Direction to a person involved in airspace change, the Act provides the CAA with enforcement powers and the ability to determine and impose a penalty based on a person's turnover.

2.27 The CAA has therefore published in December its Enforcement Guidance and Draft Statement of Policy on Penalties which is required under Part 1 of the Act [see CAP 2280[12]].

2.28 In addition, the Government introduced the Air Traffic Management and Unmanned Aircraft Act 2021 (Airspace Change Directions) (Determination of Turnover for Penalties) Regulations 2021 into Parliament in November 2021. These regulations define "turnover" for the purpose of determining any penalties.

Airspace Modernisation Strategic Risks in 2021

2.29 In the first chapter we assessed each Initiative and how delivery has progressed in 2021. At a strategic level, the CAA uses this progress report to raise with the Secretary of State any concerns or risks to delivery, and advise on potential solutions or mitigations.

Airspace Modernisation Strategy Scope & Delivery Model

2.30 The scope of the UK airspace modernisation programme has been set out through the publication of the Airspace Modernisation Strategy in 2018. Since then, the context of aviation has changed and a risk has been identified where the balance of initiatives may no longer align with the requirements of stakeholders and interest groups. In order to mitigate that risk, the CAA undertook the process of refreshing the Airspace Modernisation Strategy, as described in the early sections of this chapter and will seek further feedback through a public consultation exercise commencing in January 2022.

[12] Enforcement Guidance and Draft Statement of Policy on Penalties - Air Traffic Management and Unmanned Aircraft Act 2021 Part 1 (caa.co.uk)

2.31 We must ensure that through refreshing the scope of modernisation, we do not undermine ongoing Airspace Modernisation Strategy Initiatives, such as those relating to controlled airspace and commercial air transport.

2.32 It must be noted that the delivery of the strategy will require a substantial and coordinated effort from across the industry, including the CAA, to ensure a safe and effective deployment. In the context of the new, broader scope, consideration is being given to the appropriate delivery entity and funding stream, especially in the areas outside of NATS (En Route) plc/Airspace Change Organising Group's current scope and competencies, which primarily focus on controlled airspace and commercial air transport. The Airspace Modernisation Strategy refresh consultation represents an opportunity to consider and seek opinion on this element. We are in the process of addressing this risk, working with the Department for Transport and relevant stakeholders and will confirm the outcome through an update to the Airspace Modernisation Strategy Governance Structure and delivery plan under the refreshed Airspace Modernisation Strategy.

Delivery of the Airspace Change Programme

2.33 The greatest risk in the Airspace Modernisation Strategy concerns the delivery of the FASI programme under Initiatives 4 and 5. Two of the most important and complex initiatives in the Airspace Modernisation Strategy concern the coordinated redesign of terminal and upper airspace across the UK. Last year, as a result of the COVID-19 pandemic, airports have paused their airspace changes, unable to invest in infrastructure development, due to their uncertain financial positions at the time and re-prioritisation towards recovery. To help manage this, Airspace Change Organising Group asked the Department for Transport to fund the immediate next phase of airspace change work for airports, which would help with remobilisation of airspace changes driving the Masterplan.

2.34 The CAA had supported the Department for Transport in assessing the potential to fund this work and ensure the continuation of the programme, including the environmental and other benefits to be realised through it. The Future Airspace Strategy Implementation Programme Funding Support Package (FASI Grant), had been made available to airspace change sponsors in March 2021. Further detail regarding this financial package has been provided within the section below in this chapter.

2.35 With the funding made available up until the end of the current financial year (2021/22), the CAA still considers the delivery of this Initiative to be at risk. Airports will have other, potentially competing priorities as they still recover economically from the impact of the COVID-19 pandemic. The CAA will continue to engage with airports to reinforce the importance and benefits of the airspace change programme.

2.36 A cost risk has also been identified, that the Government FASI Support Grant Funding Package is not continued into FY22/23, as a consequence leading to the majority of Airspace Change Proposals needing to pause. This has been raised at the Airspace Modernisation Strategy Co-Sponsors level where despite some of the Airspace Change Proposal sponsors being willing to continue with the work going forward, may not effectively do so, if other sponsors within their dependent cluster are paused, leading to a breakdown of collaboration needed and defined within the Masterplan. Abortive design costs due to any delay between design and consultation or mismatch in timescales for delivery of airport options and conflicts may materialise if the risk is not mitigated. Airspace Change Proposal sponsors need to understand how long design data will be valid for and assess risks, work with the Airspace Change Organising Group and other Airspace Change Proposal sponsors to ensure that both timing and designs align.

2.37 The CAA is also concerned that ongoing co-ordination among airspace change sponsors, which is necessary to take forward the Masterplan, may be impacted by the industry's ongoing recovery from the pandemic. We will continue to closely monitor this issue and continue to work closely with the Department for Transport to assist their policy development and provide support and advice, for example should it be necessary to use the Air Traffic Management and Unmanned Aircraft Act 2021, that gives powers to compel airspace change.

2.38 With regards to the Masterplan, Iteration 2 has been submitted by the Airspace Change Organising Group in December 2021. The CAA and the Department for Transport are currently assessing its content and will make a decision whether to accept it (or not).

2.39 The FASI Programme sponsors will be unable to progress through the Stage 2 gateway of the CAP1616 process until potential conflicts and interdependencies between airspace changes are represented in an accepted Iteration 2 of the Masterplan. Delays to this will impact dates by which sponsors undergo their planned Gateway 2 assessments under the CAP1616 process. It is expected by

the CAA that the sponsors have been working closely with the Airspace Change Organising Group and other interdependent Airspace Change Proposals' sponsors, to develop the appropriate Masterplan content, to the quality required.

2.40 A design and process risk has been identified, that the approach to designing multiple route options being constrained to a minimum 45-degree angles of divergence, which may limit the potential to improve noise management as part of an Airspace Change Proposal. This risk has been raised by Airspace Change Proposal sponsors with Airspace Change Organising Group, NATS (En Route) plc and the CAA's Oversight Team. The Airspace Change Proposal sponsors have committed to mitigating such risk by examining the gaps in existing materials and commencing the defining work required to close them. There is a risk that the key airspace and air traffic management concepts that drive performance improvements cannot be deployed as part of the Airspace Change Proposal.

Funding

Future Airspace Strategy Implementation (FASI) Programme Funding Support Package

2.41 The Department for Transport made funds available to support the progression of airspace design changes needed for modernisation – the Airspace Modernisation Future Airspace Strategy Implementation (FASI) Support Package. In accordance with the Secretary of State's powers (under section 16[1] of the Civil Aviation Act 1982), the CAA is required to aid and advise in connection with the administration of the fund.

2.42 This grant is intended for the FASI Airspace Change Proposal sponsors to fund the relevant activities that are required to progress their Airspace Change Proposals through Stage 2 of the airspace change process (CAP1616). That work has also supported the development of an airspace change Masterplan produced by the Airspace Change Organising Group.

2.43 To restart airspace change activities as part of the FASI programme, airport change sponsors required short term funding to help them progress through Stage 2 of the CAP1616 process. Therefore, the Department for Transport provided the CAA with £1.5m, in the 2020/2021 financial year and a further £4m for the 2021/2022 financial year. The fund of £5.5m (£5,476,409 allocated to the airport sponsors) equates to 68% of the estimated funding required for all the sponsors.

Once the CAA received confirmation of funding from the Department for Transport, this information was communicated with the industry in March 2021.

2.44 The CAA worked with the Department for Transport and the Airspace Change Organising Group to establish the grant funding process during the second half of March 2021. The CAA then collaborated with all Airspace Change Proposal sponsors, supported by Airspace Change Organising Group, to ensure funding and requirements of each sponsor are in alignment across the full programme and submitted to the CAA for approval. The CAA Oversight Team scrutinised the submissions and set up baselines for each of the change sponsors, to verify claims against, alongside any evidence which would be submitted during the claims process, (in line with the terms and conditions of the commercial contract agreements that were entered into between the Airspace Change Proposal sponsors and the CAA).

2.45 There were some barriers to a speedy progress in the early stages of the grant funding programme (April and May), with tasks requiring carefully thought through working solutions, for this newly established bespoke funding process. These were mostly administrative in nature, for example in addressing resourcing issues (such as new team members) on the change sponsors part, which resulted in the need for enhanced the Airspace Change Organising Group and CAA communications and additional time in onboarding third-party suppliers by the sponsors.

2.46 There are twenty one UK airports involved in the delivery of the national programme to redesign terminal airspace that the Airspace Change Organising Group is coordinating. However, there are only eighteen sponsors participating in the FASI Grant programme: Aberdeen, Biggin Hill, Bournemouth, Bristol, Cardiff, East Midlands, Edinburgh, Exeter, Gatwick, Glasgow, Heathrow, Leeds-Bradford, London City, Luton, Manchester, Southampton, Southend and Stansted.

2.47 The remaining three airports, which are involved in the national FASI programme but are not currently participating in the grant funding programme are Liverpool, Manston and RAF Northolt. RAF Northolt is not eligible for the grant funding, being a military airbase and neither is Liverpool, which is currently in Stage 4 of the CAP1616 process. Manston has sought to progress its Airspace Change Proposal without the use of the grant funding.

2.48 As of December 44.3% of the total budget has been spent (£2.44m of £5.5m), with the main activities consisting of programme remobilisation efforts, holding stakeholder engagement sessions, Masterplan coordination work, route options development and design principles evaluation.

Airspace Modernisation Strategy Support Fund

2.49 The CAA has set up the Airspace Modernisation Strategy Support Fund which is intended 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[13] (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 legal entities[14] in the UK, other than NATS (En Route) plc and the CAA, to seek financial support to deliver against the Airspace Modernisation Strategy Initiatives, where the required work cannot be funded by other means.

2.50 The dedicated fund of £2 million per annum is funded through the UK State overflight charging mechanism (en-route unit rate) for commercial air transport. It was established as part of the UK regulatory cycle reference period (RP3) performance plan, and we expect provision to continue into the new performance plan for the period 2023 to 2027, known as NR23. The fund will be collected through the CAA element of the en-route unit rate and administered by the CAA. Any unused funds will be returned to airlines through an adjustment to the UK unit rate in the future regulatory period.

2.51 The Airspace Modernisation Support Fund is open to UK aviation industry organisations excluding NATS (En Route) plc and the CAA; if required, either NATS (En Route) plc or the CAA can be subcontracted by another organisation to provide services to a project. The fund has been created to support the delivery of initiatives defined in the Airspace Modernisation Strategy and therefore funding proposals must align with the overall Airspace Modernisation Strategy objectives. The current set of initiatives in the Airspace Modernisation Strategy are broad in

13 The Terms of Reference for the Future Airspace Strategy (FAS) Deployment Facilitation Fund (CAP1249) can be found here.

14 Legal entities must be UK aviation industry, engaged in modernising the UK airspace.

their description and will evolve with further iterations of the strategy, but we expect a proposal's ambition to support the ends (the outcomes) of modernisation.

2.52 Money will be allocated on the basis of bi-annual calls for applications. We welcome any relevant proposals to be submitted, thereby providing an opportunity for a wide range of organisations to come forward as long as their proposals align with and support the Airspace Modernisation Strategy Initiatives.

2.53 The CAA's Oversight Team will function as the Airspace Modernisation Support Fund Advisory Board, together with one or two CAA technical specialists. They will consider the proposer's business case in accordance with assessment criteria set out in the Terms of Reference before they give advice and make recommendations to the Decision Board.

2.54 The role of the Airspace Modernisation Support Fund Decision Board is to act as an objective and independent decision-maker, providing advice to the Chair of the group on the approval or rejection of funding proposals to the Airspace Modernisation Support Fund. The CAA's Airspace Modernisation Strategy Assurance Group (see below), takes on the role of the Airspace Modernisation Support Fund Decision Board on a bi-annual basis, and airline representatives will also be invited to participate in the decision-making on Airspace Modernisation Support Fund funding allocations.

2.55 Once a positive decision to fund a project has been made, there is an on-going requirement on the CAA to provide oversight of its delivery. This work will be managed and administered by the CAA's Oversight Team and will be reported to the Joint Airspace Modernisation Strategy Programme Board, co-sponsored by the Department for Transport and the CAA.

2.56 The CAA issued the first call for applications to the fund on 30 September 2021. All information can be found on a dedicated Airspace Modernisation Support Fund webpage, including guidance on how to apply. The call for applications runs until the end of 2021, and a Decision Board meeting will be held in February 2022, where a decision on fund applications will be made. The CAA will confirm in due course when the next call in 2022 will be issued.

CAA Resource

2.57 Different departments within the CAA may have different roles within the Airspace Modernisation Strategy. From a Co-Sponsor perspective, the CAA may have

strategy or policy responsibilities. From a regulatory perspective, the CAA may be a decision-maker, or may have a technical role in introducing certain requirements.

2.58 With the Airspace Modernisation Strategy Refresh activity undertaken this year, the Airspace Modernisation Team has expanded in line with existing budget, to undertake stakeholder engagement activity and produce the content for the Airspace Modernisation Strategy refresh. Further hires may be considered to further support the team as programme momentum builds.

2.59 On Initiatives 4 and 5, which together comprise the airspace change programme and include the work Airspace Change Organising Group is doing to develop an airspace change Masterplan, the CAA is acting in a strategic role. In order to confirm that the Masterplan is consistent with Government policy and the CAA's own statutory airspace functions, the Co-Sponsors must assess the Airspace Change Organising Group's progress. Based on that assessment, and before the Masterplan can be implemented, the CAA must decide to formally accept the Masterplan into its Airspace Modernisation Strategy, having consulted the Secretary of State. The CAA is responsible for setting the acceptance criteria for the Masterplan.

2.60 The CAA must provide oversight of the delivery of the Masterplan and, from a regulatory perspective, decide whether to approve the twenty one lower-altitude Airspace Change Proposals that comprise of the Masterplan programme. This has led to the CAA increasing its staff resource within its oversight function, in testing and monitoring the delivery of the Masterplan, in addition to administering and managing the FASI Grant on behalf of the Department for Transport (as described above in this chapter).

2.61 The CAA will also need to consider its resource with the airspace regulation function for making decisions about individual changes. The CAA Airspace Regulation resource constraints could cause delay to the review of Airspace Change Proposal submission documents impacting sponsor timelines. Sponsors are working with the CAA and the Airspace Change Organising Group to ensure all Airspace Change Proposals and submissions are deployed with CAA resource available.

2.62 The CAA has recruited a new specialist to address the shortage of Instrument Flight Procedure expertise in the Airspace Regulation team. The CAA has also brought the Swiss Air Navigation Service Provider's (SkyGuide) Instrument Flight

Procedure team onbaord, to process the routine five- yearly reviews, to reduce the load on its own resource. It should be noted that the availability of suitably qualified individuals has been impacted by the UK leaving the European Union, due to complexities in the recruitment of overseas staff.

2.63 On Initiative 10, the CAA is directed to, among other things, regularly consider whether airspace classifications should be reviewed, carry out a review where the CAA considers a change to classification might be made and amend airspace classifications as the CAA considers appropriate. The CAA has therefore been undertaking policy development work to design and consult on a new process, introduced in December 2020. In addition to that, the CAA holds a delivery function role, with the creation of the Airspace Classification Review Team, to design and propose an amendment to the airspace classification. The CAA has now recruited four specialist roles in airspace design, environment, cartography and safety management, along with an Engagement Lead and a Team Principal function. Progress of the work has been described in Chapter 1.

2.64 On Initiatives 9 and 11 the CAA has a regulatory role, in that we must set out the technical solutions required to enable delivery of the Airspace Modernisation Strategy initiatives. The work the CAA has done to make progress on these, has now been superseded by the work on the Airspace Modernisation Strategy Refresh, further described earlier on in this chapter.

2.65 On Initiative 15, the CAA is providing regulatory (policy and technical) expertise within the Aeronautical Information Management and Meteorological Information disciplines. Limited resource within this team may increase reliance on third party contractors for delivery, which may impact on planned delivery timescales.

CAA Airspace Modernisation Strategy Assurance Group

2.66 In order to manage the overall efficiencies of resource allocation and effort prioritisation within the CAA, in support of delivery within the areas relevant to the Airspace Modernisation Strategy, a senior management group has been established internally.

2.67 As highlighted in sections above, several Initiatives within the Airspace Modernisation Strategy require cross-CAA development of technical policies, to support industry implementation. Staff across the CAA will be involved in developing these Initiative areas and will be required to update the Oversight Team, linking in with the Airspace Modernisation Strategy Governance Structure

for reporting on progress and risks to the Airspace Modernisation Strategy Co-Sponsors, and complementing the CAA's internal governance process through reporting into its Airspace Programme Board.

2.68 The group, which comprises of different teams and areas of expertise, will be focussed on airspace and infrastructure developments in support of Airspace Modernisation Strategy deployments, where the CAA has a prime task to enable those deployments. The broad scope of the Initiatives offers the group a unique insight into the potential cross technical policy dependencies and therefore make informed decisions on the required CAA input. Its work will also cover areas of drone integration, space launch operations, Unified Traffic Management development and Airspace Management and Air Traffic Services.

2.69 In addition to that, the group will make decisions on the need for an airspace classification review, as per the CAP1991 process and will periodically engage with representatives of the airline community, as part of its Decision Board function for the Airspace Modernisation Strategy Support Fund, to allocate the funding in line with the benefits of the proposals received from the wider industry.

Chapter 3

Progress within Areas of General Aviation and Communities Interest

Introductions

3.1 This chapter has been created in response to the feedback received by the Airspace Modernisation Team to provide updates related specifically to activities undertaken under the Airspace Modernisation Strategy, with particular interest from the General Aviation and Communities stakeholder groups. Whilst overall progress updates for each of the Airspace Modernisation Strategy Initiatives have been provided in Chapter 1, below is a summary of key activities and topics within the airspace modernisation agenda.

3.2 These activities and topics reflect the CAA's current ambitions based on the work it has done to date and will be subject to public consultation on the revised Airspace Modernisation Strategy (and therefore may be subject to change).

Airspace Modernisation Strategy

3.3 The aim of the Airspace Modernisation Strategy Refresh, stakeholder engagement and co-creation activity described in more detail within Chapter 2, is to ensure airspace modernisation responds to requirements of all stakeholders and interest groups, in a balanced manner. For that reason the refreshed Airspace Modernisation Strategy, due for public consultation next month, will not be broken down into silos of work but will be a single airspace strategy that will clearly show the benefits to all the individual airspace users.

3.4 Ideally, the air navigation system should avoid to the greatest extent possible imposing any restrictions on individual flight operations. In practice, this is rarely feasible because of external constraints (beyond the control of air navigation services) or at times conflicting needs of airspace users, amongst other reasons. Integration and flexibility of operations in the UK airspace is a key priority of the Airspace Modernisation Refresh to help deliver an air navigation system flexible enough to integrate changes in business and operational trajectories at the frequency required by airspace users. This requires use of onboard and ground based information exchange technologies to provide timely operational

information that allows for as much freedom to operate as possible for the end users whilst ensuring safe separation from other users.

3.5 We have started to deliver this through our work on Electronic Conspicuity and the initial developments for ground use of this information source through the Flight Information Display capability.

3.6 We will look to aid deployment of new user requirements through the use of existing regulatory frameworks to help manage the burden on existing and new users whilst developing operational integration further through the Lower Airspace Service concept.

Access to Controlled Airspace | Size and Regulation of Controlled Airspace | Flexible Use of Airspace *(at low level and in addition to the existing Airspace Modernisation Strategy Initiative 3 scope)*

3.7 The Airspace Modernisation Strategy refresh is driven by the intent of improving the overall access to airspace for all users in the spirit of '*integration over segregation'*. It will focus on better use of airspace, especially with the principle of *'only using what is required and when'*. Access to controlled airspace is already available to those that ask, but there will be more emphasis on the type of airspace classification used, along with the types of service provided, for better flexibility for the Visual Flight Rules pilot. Flexible access airspace will be an aim such that it becomes controlled when an Air Traffic Control Service is required for Instrument Fligh Rules flights, and the in-use airspace will be structured around the specific procedures in use at that time. The CAA's Airspace Classification Team will continue to review the classification of airspace and to amend volumes where appropriate.

3.8 We are also required to seek to ensure that the amount of controlled airspace is the minimum required to maintain a high standard of air safety and, subject to overriding national security or defence requirements, that the needs of all airspace users are reflected on an equitable basis.

3.9 Furthermore, whilst segregation will remain for specific activities, where safety is a concern i.e. military firings, space launch etc., more flexibility will be sought for Danger Areas only being active for the minimum safety required and time required.

3.10 The long-term objective is that this airspace will better facilitate autonomous, self-managed use by suitably equipped aircraft.

3.11 It is intended to progress a Lower Airspace Service that will provide the services and airspace management necessary to better enable these changes.

Radar Based ICAO Flight Information Services

3.12 As mentioned above a surveillance based ICAO Flight Information Services is planned to replace the current Lower Airspace Radar Service and other flight information service providers. This will be a dedicated service for the lower airspace user. The concept is being developed and planned for it to take advantage of cooperative surveillance and be available 24/7 but with a focus on the daylight hours. In addition, this service would also provide the airspace management function for flexible access airspace, enable Remotely Piloted Aircraft Traffic Management conduit and be the stepping stone to autonomous airspace.

Electronic Conspicuity

3.13 The Industry Task Force is currently in place, as a result of the CAA reaching an agreement with the Department for Transport on Electronic Conspicuity. The Task force will focus on air and ground specifications for enabling and delivering the concept. In particular, the task force will look at Electronic Conspicuity requirements related to airspace access and Beyond Visual Line Of Sight Remotely Piloted Aerial Systems integration. Further detail on progress has been provided in Chapter 1 of this report.