



ACOG



ANNUAL REPORT 2022/23

Airspace Change Organising Group

- Page blank -

Contents

Chairman’s Statement	4
Head of ACOG’s Statement	6
1. Introduction.....	8
2. Review of 2022/23 and milestones looking ahead to 2023/24	12
3. Risks to the Programme.....	22
4. Finance	26

Chairman's Statement



Unsurprisingly, the beginning of the exit from the global pandemic last year was characterised by significant uncertainty, turbulence and readjustments across populations and sectors, and to a significant degree this still applies, not least in transport and travel. Maintaining a mean course for the airspace modernisation programme as we navigated the fringes of the pandemic storm following a period of being relatively becalmed was therefore not without its challenges, but the efforts of all involved – from political and business leadership through to technical design experts and the regulatory authorities – enabled progress to be made and important components of airspace change to be delivered. I welcome, commend and pay tribute to those efforts.

Notwithstanding, the imperatives for change – sustainable performance, improved operational efficiency, resilience and capacity relief – lost none of their urgency in the interim. If anything, better understanding of the requirements and wider visibility of them served to accentuate the critical nature of the national airspace modernisation mission and the impediments in the way of timely progress that must be addressed. Unpacking the latter identifies four broad categories of implied tasks: resources; improved programme management; streamlined processes; and joint leadership.

The continual background hum of the FASI funding debate is at odds with a national infrastructure programme, particularly one promising to offer such substantive contributions to decarbonisation and other pressing environmental problems and is distinctly unhelpful from programme stability and stakeholder confidence perspectives. Encouragingly, there are signs of a burgeoning social responsibility-led appetite in the sector to examine more distributed funding models that benefit from closer alignment of reward with investment and this trend should be nurtured and leveraged in the months ahead. At the tactical level, the impact of an extremely limited pool of technical design expertise, itself spread across the quality spectrum, is already apparent and, left untreated, will likely prove to be a critical vulnerability as the airspace modernisation programme scales and inevitably increases in complexity. Bolstering and brigading this capability area intelligently should not be left to chance and is time sensitive. ACOG's insight into programme interdependencies and optimal delivery sequencing can and should inform addressing this significant weakness.

I think it fair to say that it is not universally understood that ACOG wields no executive authority – the Group's role is confined to integrated planning at the strategic level, facilitating, arbitrating, advocating and, if required, escalating. Whilst diligent application of these tools has sustained

programme integrity through recent choppy waters and delivered the key outputs of an early iteration of the Airspace Masterplan and the necessary understanding and coordination that underpins it, ACOG's ability to hold the ring is nevertheless fragile. Moreover, our potential roles in promulgating and ensuring the adoption of best practice, such as quality assuring change proposals upstream of CAP1616 Stage Gates, are neither enshrined in our terms of reference, nor resourced. Necessarily, therefore, they are limited to best endeavours on a consensual basis, perhaps offering an avenue through which to strengthen programme delivery performance going forwards.

The litigious environment within which the CAA's CAP1616 Airspace Change Proposal process was originally built led to a perhaps understandably prescriptive process that is tailored to individual or serial assessments of change cases, a structure that will be severely challenged when faced with multiple interdependent and complex change proposals. ACOG provided feedback on potential areas for improvement in our advice on remobilising the airspace change programme after the pandemic and the Authority is currently evaluating responses to a recent consultation on CAP1616. Early indications are that the consultation has helpfully illuminated opportunities to streamline the process and make it more predictable and this is to be welcomed. However, good regulation and oversight is a product of well-crafted, relevant and concise regulations that are risk based and outcome focused, supported by intelligent interpretation and support, including from the regulator directly. The high Stage Gate failure rates being experienced currently will have multiple contributory factors, but we must work harder collectively to ameliorate them or risk de-railing the programme timelines even further.

The convention and requirement for separation between decider, deliverer and assurer is well established. Nonetheless, ideologically drawn organisational boundaries or hierarchies and the 'layers in silos' they sponsor obstruct progress and induce delay. The principles guiding airspace modernisation delivery must be clearly articulated and upheld by their owners, but the processes and structures that are derived from them will benefit from joint leadership and collegiate working across boundaries. There may be occasions when worthy initiatives or proposed changes in direction need to be compartmentalised, examined discreetly and actioned sensitively, but otherwise inclusion and transparency should be the order of the day, offering the surest protection against the threats to mission success posed by uncertainty, erosion of confidence and poor engagement.

The year ahead will require higher gears than hitherto as the rate of delivery increases and the conditions for success in the most challenging components to come are set. ACOG possesses the energy, enthusiasm and understanding to continue to chart the optimal course and collectively, from Steering Committee to domain experts, we look forward to doing so with all stakeholders.

Sir Timo Anderson

KCB DSO

Chair, ACOG Steering Committee

Head of ACOG's Statement



Welcome to this our third ACOG annual report where we set out some real progress towards modernising airspace as the industry continues on its recovery from COVID. We are not yet out of the woods of course and many airports and airlines continue to struggle with financial challenges, a backdrop against which ACOG strives to achieve the much-needed goal of airspace modernisation.

The start of 2022 saw the Government provide the remainder of the funding ACOG had advocated during COVID, bringing the total to £9.2m. This has enabled the airport-led airspace changes to complete Stage 2 of the CAA's airspace change process. This was followed closely by the formal acceptance of ACOG's Airspace Masterplan (Iteration 2) by the Co-Sponsors of the programme and meant that airports could move to the next stage of the process that involves refining the airspace options to support the development of the next draft of our Masterplan in 2023.

During the year our Co-Sponsors also agreed ACOG's proposal for organising the UK's lower airspace into regional airport clusters. Each subsequent iteration of the Masterplan will deliver a completed region of the UK's airspace modernisation and its associated benefits. For the southeast of England (the London terminal manoeuvring area) this will be further sub-divided into manageable portions of airspace.

Other highlights this year include: the approval of ACOG's Masterplan safety strategy, designed to make sure that the current excellent safety standards across the UK's airspace are, as a minimum maintained and exceeded where possible; and the development of a Cumulative Analysis Framework (CAF) which will provide guidance and analytical tools to support the appraisal and trade-off of impacts caused by multiple airspace changes using the same airspace.

The drive towards net zero by 2050 continued to be a focus for ACOG and this year we published our environmental strategy as well as completing the first phase of an environment-based trial with Manchester airport. This will illustrate the benefits of modernisation using state of the art tools to baseline environmental efficiency of the new route structures.

With so many stakeholders interested in the programme, engagement remains a priority. Highlights this year include the appointment of a general aviation coordinator to engage with other airspace users; the formation of a Community Advisory Panel to assist ACOG on wider public and community engagement on the Airspace Masterplan; and a partnership with British Chambers of Commerce in a

series of roundtables to inform political and business stakeholders about the potential economic benefits of upgrading airspace.

Finally, the programme is unsurprisingly not without risk. With government support funding ending in April 23, the Industry must consider the means through which all airports can remain within the programme to constitute a truly national endeavour. As some airports fail to make their planned gateways through the CAA's process, there is a risk of programme compression whereby the regional clusters become bunched and the resource capacity to deliver the programme in a coherent way may become challenging. The ability to deliver an environmentally optimised programme will also remain a key challenge throughout the duration of this work and the benefits led approach will need to be crystal clear on environmentally favourable outcomes.

Mark Swan

Head of the Airspace Change Organising Group

1. Introduction

1.1. Overview of Airspace Modernisation

1. Aviation keeps people connected and provides the air services that the UK needs for business, leisure, tourism and overall economic growth. All forms of aviation depend on access to the airspace making it a vital but largely invisible part of our national infrastructure. The basic design of the airspace has remained the same for decades, despite the massive increase in demand for flying and a step change in the capability and diversity of aircraft. Our airspace is now outdated, inefficient and reaching capacity. Modernisation is long overdue, and a transformation of the overall airspace design is critical to ensuring the infrastructure is fit for purpose in the future.
2. The Department for Transport (DfT) and Civil Aviation Authority (CAA) co-sponsor airspace modernisation in the UK. The DfT develops and owns national aviation policy, including the strategic case for airspace modernisation.¹ As an independent regulator and technical advisor to the Government, the CAA develops and maintains the UK Airspace Modernisation Strategy (AMS).²
3. The AMS describes the initiatives that the aviation sector must deliver to achieve the Government's modernisation vision for **“quicker, quieter, cleaner journeys and more capacity for the benefit of those who use and are affected by UK airspace.”** The AMS initiatives include upgrades to the UK's airspace structure and route network, new operational concepts for improving environmental performance and advanced technologies that enable greater integration of different forms of aviation, including commercial air transport, General Aviation, the Military and new and rapidly developing parts of the sector like remotely piloted aircraft systems (known as drones) and advanced air mobility (often referred to as air taxis).

1.2. Introduction to ACOG, the Masterplan and the Programme

4. The Airspace Change Organising Group (ACOG) is a team of technical, programme management and communications specialists. ACOG is tasked with developing and maintaining the UK Airspace Change Masterplan (the Masterplan). The Masterplan is a single coordinated implementation plan for airspace changes in the UK up to 2040 to upgrade the UK's airspace design and deliver the objectives of airspace modernisation at a national and regional level.

¹ Upgrading UK Airspace, Strategic Rationale, DfT, viewed [here](#).

² Airspace Modernisation Strategy, CAA CAP1711 Edition 2, Parts 1 and 2, viewed [here](#).

5. NATS (En Route) plc (“NERL”) is accountable under its licence to produce the Masterplan. NERL delivers this obligation through ACOG – a separate and ring-fenced entity that operates independently with oversight from an impartial Steering Committee of senior experts drawn from across the aviation sector. ACOG is funded through the charges levied on commercial air transport operators that use the UK’s airspace. ACOG’s funding is agreed upon as part of NERL’s Business Plan.
6. The Masterplan is a strategic plan made up of individual Airspace Change Proposals (ACPs). The most important ACPs are organised into two joint initiatives: FASI (Future Airspace Strategy Implementation) South and FASI North. Together these initiatives represent the UK’s Airspace Modernisation National Infrastructure Programme (the Programme). The Programme encompasses the requirement to fundamentally transform the airspace design at lower altitudes and in the terminal airspace that serves commercial air transport across the busiest regions of the UK.
7. ACOG is preparing the Masterplan in a series of iterations. More detail is added with each iteration as the ACPs in the Programme progress. The co-sponsors assess that each iteration of the Masterplan covers the right material using a set of published acceptance criteria.³ Once accepted formally into the AMS, the Masterplan, along with the CAA’s general duties (set out in section 70 of the Transport Act 2000), form the basis against which the CAA’s Airspace Regulation team make decisions on the individual ACPs.
8. Iteration 1 of the Masterplan, produced in 2019, is a high-level plan of the airspace changes needed for modernisation in Southern England. Iteration 2, produced by ACOG in 2021, following the COVID-enforced hiatus to the Programme, catalogues the likely interdependencies between the ACPs with the scope extended to the whole of the UK and illustrates the approaches that will be taken to resolve design conflicts and balance any trade-offs. ACOG’s Iteration 2 was accepted formally into the AMS in January 2022, following the CAA’s assessment and consultation with the Secretary of State for Transport.
9. ACOG is now preparing Iteration 3 of the Masterplan that describes the proposed airspace structure and route network envisaged by the Programme ACPs when viewed as a collective but without the detailed designs of all the routes. Iteration 3 will set out any conflicts and trade-offs between the proposals in greater detail than Iteration 2, with more information about the cumulative impacts of different design choices and the methods used to calculate them.
10. To speed up the Programme, offer flexibility and release benefits as early as possible, from Iteration 3 onwards, the Masterplan is divided into separate regional clusters with different timelines. ACOG has organised the Programme into four clusters: Scotland, Northern

³ Airspace change masterplan, CAA acceptance criteria, CAP2156a, edition 2 can be viewed [here](#).

England, the West, and London and the Southeast. Each cluster requires a NERL-led ACP (concentrating on the airspace network above 7000ft.) to be coordinated with several airport-led ACPs (that focus on the arrival and departure routes that serve their operations below 7000ft.) so that the transformation in the overall airspace design in each region are optimised.

11. The clusters vary in size and complexity. For example, the interdependencies and conflicts between the ACPs in Scotland are fewer and simpler than those in London and the Southeast. The ACP timelines are generally shorter in the simpler clusters. As a result, Iteration 3 of the Masterplan will be developed and submitted to the co-sponsors according to the timelines for each regional cluster.

1.2. ACOG Governance Arrangements

12. The DfT and CAA, as co-sponsors of airspace modernisation, provide the policy framework and regulatory oversight that guides and dictates ACOG's work. This governance framework is set out in the AMS.
13. ACOG's main governing body is the ACOG Steering Committee, chaired by an independent non-executive Chair. The Steering Committee comprises an additional nine members who collectively possess a broad range of aviation experience, demonstrable capability at Board level of leading and delivering complex national-level programmes and a thorough understanding of government legislative and regulatory processes.
14. The ACOG Steering Committee exercises the primary governance function of assuring the ACOG programme of work and deliverables and is responsible for signing off each iteration of the Masterplan. In this capacity, the Committee's responsibilities are as follows:
 - Acting collegiately, provide constructive challenge, strategic guidance and specialist advice to ensure that ACOG objectives and deliverables are clear, understood and delivered on time and to the required standard.
 - Oversee the work of ACOG and use best endeavours to resolve issues relating to the delivery of the programme in a timely way (noting that members are not acting as representatives of aviation industry stakeholder groups but are appointed as individual subject matter experts). If, after making all reasonable efforts, the Committee cannot resolve an issue, it will recommend options and any resulting implications to the co-sponsors via the CAA.
 - It is expected that the SC will be able to agree on most significant issues objectively and impartially. Where this is not possible, the range of views will be made available to the co-sponsors via the independent Chair of the Committee, along with his/her recommendation as to the best course of action.

- Form part of the review process for setting yearly budgets within NERL's Reference Period settlements as determined through the CAA's economic licensing process, which includes consultation with a wide range of stakeholders, and noting there will be a ring-fenced overall budget for ACOG for the applicable reference period.
 - Review the effectiveness of ACOG activities, programmes, structures and processes employed in delivering ACOG's objectives, ensuring that the organisation operates effectively and efficiently.
15. There are a series of regular reporting functions to the co-sponsors on Masterplan progress, up to and including the ACOG Steering Committee Chair to the DfT's Aviation Strategy Board and Ministers. ACOG is subject to annual external programme audits by an independent Infrastructure Programme Authority (IPA) accredited major programme reviewer. In this capacity, an IPA reviewer audited ACOG in Q3-22 to validate the group's organisational structure, functions and core processes. In addition, ACOG is an ISO90001-accredited organisation (achieved in 2021 and successfully reaccredited in 2022) with a robust quality management system that is externally audited under the International Standards Organisation protocols. This contributes to the external and independent checks and balances by way of audit and by continuously improving the ACOG working environment.

2. Review of 2022/23 and milestones looking ahead to 2023/24

16. ACOG's objectives in table 1 provide a useful point of reference to consider the key achievements of 2022/23 and look ahead at the major milestones for 2023/24.

TABLE 1: ACOG's OBJECTIVES

1.	Lead the creation of a credible and implementable Masterplan for the Programme, working collaboratively with ACP sponsors and other stakeholders.
2.	Coordinate optimised airspace decisions through the identification of design interdependencies and facilitation of cumulative analysis and trade-off decisions.
3.	Demonstrate the collective benefits and impacts of the Programme.
4.	Build a broad base of support for airspace modernisation and join up the ACP sponsors' approach to public consultations on interdependent ACPs.

2.1. Lead the creation of a credible and implementable Masterplan

17. The start of the year saw a positive announcement from the Government that it would provide the remainder of the funding ACOG had advocated during COVID to enable the airport-led ACPs to restart and complete Stage 2 of the airspace change process (CAP1616). Together with the formal acceptance of Masterplan Iteration 2, this announcement meant that airports could move through the next important stage of the CAP 1616 process, refining the options appraisals needed to support the development of Iteration 3.
18. The 22/23 achievements linked to creating the Masterplan and the milestones looking ahead to 23/24 are summarised in Table 2.

TABLE 2: Preparing the masterplan, achievements and milestones looking ahead

Theme	22/23 Achievements	23/24 Milestone Lookahead
Secured further Government funding for the Programme ACPs and supported the CAA-led administration of the grants.	<ul style="list-style-type: none"> • In Q2-22, ACOG compiled the cost, benefit and programme impact information required to help to secure further Government funding for 22/23. • In Q3-22, ACOG advised the CAA on the inputs required to apportion the grant funding and ensure all ACP sponsors could maintain their progress through Stage 2 of CAP1616. 	<p>Q2-23: Complete analysis commissioned by the co-sponsors to provide a best estimate of the total financial cost of delivering the Masterplan ACPs from Stage 3 of CAP1616 onwards now that the Programme is moving back to private sector funding.</p>
Scope of the Masterplan Iteration 3	<ul style="list-style-type: none"> • In Q2-22, ACOG defined and agreed the scope and structure of the Masterplan Iteration 3 with the co-sponsors. • In Q4-22, ACOG worked with the CAA to support the update to the Masterplan Acceptance Criteria (CAP2156a) that was published in December 2022. 	<p>Q1-24: Complete the first phase of work with CAA's appointed consultants to support the development of the Strategic Environmental Assessment of the Masterplan Iteration 3 for the Scottish cluster.</p>
Clustered approach to developing the Masterplan and deploying the ACPs.	<ul style="list-style-type: none"> • In Q4-22, ACOG demonstrated how the transformation of the overall airspace design is best delivered by separating the Masterplan into regional clusters with different timelines. The co-sponsors formally accepted ACOG's advice on the clustering approach and arrangements to manage the interdependencies between clusters into the Masterplan as part of an Addendum published in October 2022. 	<p>Q3-23: Complete engagement with the public on the overall airspace design of the draft Masterplan Iteration 3 for the Scottish regional cluster in before submission of the co-sponsors for assessment.</p> <p>Q2-23: Complete work with the CAA and the ACP sponsors in London and Southeast cluster on the end-to-end process for</p>

- Between Q2-22 and Q1-23, Aberdeen, Glasgow and Edinburgh in the Scottish cluster, Bristol and Cardiff in the West and Southampton, RAF Northolt and Biggin Hill in the London/Southeast all completed Stage 2 of CAP1616 in line with the assessment provided in the Masterplan Iteration 2.
 - In Q3-22 Liverpool John Lennon Airport resumed development of its Masterplan ACP in the Northern regional cluster, following ACOG advice to the co-sponsors.
 - In Q4-22, ACOG developed guiding principles for forming an ACP development and deployment plan for the large and complex London and Southeast regional cluster, including the approach to organising the ACPs into modules for deployment.
 - In Q1-23, ACOG coordinated the development of an overall airspace design for the Scottish cluster, supporting the integration of the Glasgow and Edinburgh airport ACPs with the NERL Scottish Terminal Airspace ACP.
 - In Q1-23, ACOG finalised the development and deployment plan for the ACPs in Northern England cluster, following endorsement from NERL and the airport sponsors.
 - In Q1-23, ACOG provided advice to the co-sponsors on the implications and options for the West cluster ACPs to tackle delays associated with post-COVID funding challenges.
 - In Q4-22, ACOG provided advice to the co-sponsors on integrating a new Farnborough Airport ACP into the Masterplan. The co-sponsors accepted this advice and Farnborough has joined the London and Southeast cluster.
- deploying airspace changes in the complex London Terminal Maneuvering Area, ensuring the approach is coherent, operationally feasible and compliant with the regulatory process set out in CAP1616.
- Q4-23:** Established a final development and deployment plan for the ACPs in the London and Southeast cluster that is formally endorsed by NERL, the airports and the co-sponsors. The plan will inform the development of Iteration 3 for the London and Southeast cluster, and the associated public engagement in 2024/25.
- Q1-24:** Coordinated the development of an overall airspace design for the Northern England cluster, supporting the integration of Manchester, Liverpool, Leeds and East Midlands airport ACPs with the NERL Manchester Terminal Airspace ACP.
- Q2-23:** Update and agree on the West cluster ACP development and deployment plan in response to the co-sponsors decision regarding the approach to tackling post-COVID funding challenges.
- Q2-23:** Seek co-sponsor endorsement of a re-baselined programme for the preparation of all future masterplan iterations and the associated airspace deployment, following delays to the preparation of Iteration 3, linked to ACP gateway failures and funding challenges.

<p>Masterplan Safety Assurance Strategy</p>	<ul style="list-style-type: none"> In Q1-23, ACOG agreed the Masterplan Safety Strategy with the CAA, following input and endorsement from the Programme ACP sponsors. The strategy aims to ensure all relevant safety assurance activities conducted by the ACP sponsors that underpin the overall system-wide airspace design proposal in each cluster are coordinated and clear evidence of the outputs and interfaces is provided as part of the regulatory submissions. 	<p>Q3-24: Develop and agree the Safety Assurance Delivery Plan for the Scottish cluster ACPs.</p> <p>Q4-23: Develop and agree the Safety Assurance Delivery Plan for the Northern cluster ACPs.</p> <p>Q4-23: Develop and agree the Safety Assurance Delivery Plan for the West cluster ACPs.</p> <p>Q1-24: Develop and agree the Safety Assurance Delivery Plan for London & Southeast ACPs.</p>
---	---	---

2.2. Coordinate optimised airspace design decisions

19. NERL and the airports that are sponsoring ACPs to deliver airspace modernisation must work together to integrate their respective designs, manage the interdependencies and coordinate their consultations with all affected stakeholders. ACOG's coordination is required to track potential design conflicts and the solutions available to resolve them, building a transparent understanding of the cumulative impacts and trade-offs to optimise the overall design. Coordination is also needed to sequence the timelines for deploying changes at the national and regional levels, recognising that the industry does not have sufficient resources to implement all the required modifications at the same time while maintaining the safety and efficiency of the existing airspace.
20. The 22/23 achievements linked to coordinating optimised airspace design decisions and the milestones looking ahead to 23/24 are summarised in Table 3.

TABLE 3: Coordinating optimised airspace design decisions, achievements and milestones looking ahead

Theme	22/23 Achievements	23/24 Milestone Lookahead
Programme coordination	<ul style="list-style-type: none"> ACOG conducted regular programme management and technical coordination groups with the ACP sponsors in each regional cluster throughout 2022. In Q2-22, ACOG recruited two additional programme coordination resources to further strengthen the team. In Q3-22, ACOG has developed a framework for tracking the identification and management of each major design interdependency to ensure that assessment, trade-off and optimisation activities are transparent to stakeholders. 	<p>Q2-23: Update the Programme risk and opportunity framework to improve transparency and strengthen the alignment between the risk management activities of the ACP sponsors, ACOG and the co-sponsors.</p> <p>Q2-23: Strengthen the ACOG programme planning and reporting arrangements in response to lessons learned about the management of ACPs gateway failures and their implications for the broader masterplan development schedule.</p>
Cumulative Analysis Framework	<ul style="list-style-type: none"> In Q3-22, ACOG established a Cumulative Analysis Framework (CAF). The CAF provides guidance and analytical tools for ACP sponsors to support the appraisal of cumulative impacts that may be identified when the shortlisted 	<p>Q2-23: Complete an update to the CAF Part 1 incorporating lessons learned from the live-testing.</p> <p>Q2-23: Complete the CAF Part 1 analysis for the Scottish cluster ACPs to support the public engagement exercise on the cumulative impacts of the overall</p>

	<p>options of interdependent ACPs are compared.</p> <ul style="list-style-type: none"> • In Q4-22 and Q1-23, ACOG live-tested the CAF Part 1 approach with ACP sponsors in the Scottish and London and Southeast clusters. • Feedback gathered from sponsors regarding the scale and complexity of cumulative analysis is being used to further refine the CAF guidance and tools. 	<p>airspace design and the development of the Masterplan Iteration 3 for Scotland.</p> <p>Q4-23: Complete the CAF Part 1 analysis for the Northern England cluster ACPs.</p> <p>Q4-23: Complete the CAF Part 1 analysis for the West cluster ACPs.</p> <p>Q4-23: Complete the development of the CAF Parts 2 and 3, incorporating quantitative information from the ACP full and final options appraisals to demonstrate the combined and collective impacts of the overall airspace design for each cluster.</p>
<p>Technology options that support modernisation</p>	<ul style="list-style-type: none"> • In Q3-22, ACOG produced a discussion paper for the Airspace Strategy Board chaired by the aviation minister that considers the main technology options and new operational concepts that enable airspace modernisation in the busy terminal airspace and how they may be applied to mitigate the impacts of aircraft noise. 	<p>Q3-23: Provide an update in the Masterplan Iteration 3 for the Scottish cluster on the maturity of the technology options and new operational concepts required for airspace modernisation, including the maturity of relevant air traffic management and aircraft systems.</p>

2.3. Demonstrate the collective benefits and impacts

21. The Programme ACPs are expected to generate a range of benefits and impacts that will affect a broad mix of stakeholders. In addition, the publication of the Government's Jet Zero Strategy highlighted the Programme as a key deliverable on the industry's journey to net zero. The scale of the transformation to airspace design required to deliver modernisation means that benefits will sometimes be achieved at the expense of negative impacts elsewhere. The trade-offs between benefits and impacts must be carefully managed at the local, regional and national levels. Policy direction, quantitative analysis and qualitative information gathered through stakeholder engagement and consultation will be used by the ACP sponsors to guide their trade-off decisions and by ACOG to ensure the overall airspace design is optimised.
22. The 22/23 achievements linked to demonstrating the collective benefits and impacts and the milestones looking ahead to 23/24 are summarised in Table 4.

TABLE 4: Demonstrating benefits and impacts, achievements and milestones looking ahead

Theme	22/23 Achievements	23/24 Milestone Lookahead
ACOG Environmental Strategy	<ul style="list-style-type: none"> • In Q3-2022 ACOG finalised its Environmental Strategy on the environmental challenges and opportunities created by airspace modernisation, including how its contribution to the net-zero 2050 goals for UK aviation. 	
Research into airspace benefits and impacts	<ul style="list-style-type: none"> • In Q3-22, ACOG identified specific routes in UK airspace that consistently underperform environmentally because of inefficient climb and descent profiles to highlight the potential benefits of airspace modernisation. • In Q1-21, ACOG completed phase one of a trial with Manchester Airports Group and EUROCONTROL using the IMPACT tool to model the baseline environmental performance of the airspace design that serves Manchester Airport, enabling a detailed assessment of the potential for modernisation to generate benefits. 	<p>Q3-23: Complete joint case study analysis with EUROCONTROL to evaluate the environmental performance of UK climb and descent profiles compared with Europe.</p> <p>Q2-23: Publish report on the findings of phase one of the Manchester Airport IMPACT trial, comparing modelling of the baseline performance with the environmental outcomes derived from other potential route options to identify the potential for modernisation to generate benefits.</p> <p>Q3-23: In conjunction with easyJet, EUROCONTROL, and Manchester Airport,</p>

	<ul style="list-style-type: none"> In Q1-23, ACOG commissioned PA Consulting to review of the economic benefits of airspace modernisation to build a better understanding of the multiplied impact of the Programme ACPs. 	<p>validate the findings from the phase one IMPACT trail using full motion simulators.</p> <p>Q4-23: Complete the next phase of work with NATS and leading airline operators to demonstrate the safety and viability of new design guidance that would allow Continuous Climb Operations (CCO) in complex airspace.</p>
General Aviation Impact Assessment	<ul style="list-style-type: none"> In Q2-22, ACOG recruited a General Aviation coordinator to support the Group's engagement with other airspace users on the impacts of the Programme on access and integration for all current and potential future user groups (General Aviation, Military, Drone, Advanced Air Mobility and commercial space launch operators). 	<p>Q3-23: Complete engagement with airspace users from the General Aviation, Military, Drone, Advanced Air Mobility and commercial space launch sectors to gather feedback about the potential impacts of the Scottish cluster ACPs on airspace access and integration. The outputs will be included in the Masterplan Iteration 3 for Scotland and guide similar assessments in the other clusters.</p>
Benefits management strategy	<ul style="list-style-type: none"> In Q1-23, ACOG recruited a new benefits manager, who is using the established Benefits Framework, to develop a full Benefits Management Strategy ensuring alignment with the existing Cumulative Analysis Framework principles and CAP1616 requirements In Q1-23, ACOG completed a proof-of-concept study to identify the methodology for measuring changes in controlled airspace volumes to measure airspace access benefits. 	<p>Q2-23: Create a Strategic Benefits Map, aligning ACOG's strategic objectives with existing quantitative outputs required by CAP1616 and existing ACOG cumulative analysis methodologies.</p> <p>Q3-23: Complete full Programme Benefits Management Strategy, building from the Benefits Framework to ensure all benefits and disbenefits are identified during an ACP.</p> <p>Q4-23: Implement and maintain a benefits reporting cycle to ensure accurate tracking of all benefits and disbenefits that arise from the overall system-level design.</p>

2.5. Stakeholder communications and engagement

23. Creating and maintaining the Masterplan is the cornerstone of ACOG's work and the focus of our engagement with all stakeholders interested in airspace modernisation. ACOG has continued its comprehensive programme of communications and engagement to promote the Group's coordination role in the process, develop the Masterplan and demonstrate the importance of airspace modernisation for the future of UK infrastructure. This included the creation of a Community Advisory Panel, direct government engagement, events hosted in partnership with the British Chambers of Commerce (BCC) across the country, and a parliamentary event with over two dozen Members of Parliament in attendance.
24. The 22/23 achievements linked to stakeholder engagement and communications and the milestones looking ahead to 23/24 are summarised in Table 5.

TABLE 5: Stakeholder communications and engagement, achievements and milestones looking ahead

Theme	22/23 Achievements	23/24 Milestone Lookahead
Government and Parliamentary Engagement	<ul style="list-style-type: none"> ACOG's Chair Sir Timo Anderson held regular meetings with the Minister for Aviation over the last year, highlighting key areas of progress and the main challenges that the Programme must tackle to assure successful delivery. ACOG provided regular briefings to Members of Parliament who hold a particular interest in airspace modernisation. These included MPs local to airports keen to understand how ACPs and the Masterplan fit together and those concerned by flight paths over their communities. The Shadow Minister for Aviation and the SNP Spokesperson for Transport have also received dedicated ACOG briefings by Mark Swan Head of ACOG. 	
Public Engagement Exercise on the	<ul style="list-style-type: none"> In Q3-22, ACOG and the co-sponsors agreed the scope, approach and timelines for conducting a Masterplan Public Engagement Exercise (PEX) on Iteration 3 to 	<p>Q3-23: Conduct a Public Engagement Exercise on the draft content of the Masterplan Iteration 3 for Scotland setting out the overall airspace design envisaged by the Scottish ACPs and</p>

Masterplan Iteration 3	provide stakeholders with an opportunity to feedback on the development of the Masterplan.	explaining how stakeholders can influence trade-off decisions as part of the forthcoming CAP1616 consultation.
Community Advisory Panel	<ul style="list-style-type: none"> In Q2-22, ACOG established a Community Advisory Panel to help shape the Group's approach to engagement with community stakeholders on the Masterplan. The panel meets quarterly to improve how information included in the Masterplan is presented publicly to promote accessible and meaningful engagement. 	<p>2023/24: Conduct quarterly Community Advisory Panel meetings.</p> <p>Q2-23: Seek Community Advisory Panel members endorsement of the key materials that will be used to support the Public Engagement Exercise on the Masterplan Iteration 3 for Scotland.</p>
Business engagement	<ul style="list-style-type: none"> ACOG partnered with the British Chambers of Commerce (BCC) to hold roundtable events in Glasgow (November 2022), Manchester (December 2022) and Edinburgh (March 2022) to highlight the benefits that airspace modernisation is expected to bring to businesses and communities across the country. 	<p>Q3-23 & Q4-23: Partner with the BCC to conduct a further airspace modernisation round table events in Northern England, the West and London and Southeast clusters.</p>
Online engagement	<ul style="list-style-type: none"> ACOG's engagement via its digital channels continued to grow during 2022. A regular online newsletter was launched in Q2-22 and has been opened over 820 times, while the campaign's social channels, under its One Sky One Plan banner, continued to grow strongly with over 275,000 total impressions. 	<p>Q2-23: Publish an update to the online Masterplan Resource Centre for external stakeholders to find more information about each iteration of the Masterplan as they are developed, consider FAQs and follow links to other relevant documents and reports.</p> <p>Q2-23: Use the One Sky One Plan information campaign to promote the forthcoming Public Engagement Exercise and create an education series to help stakeholders better understand the Programme and the role of the Masterplan.</p>

3. Risks to the Programme

25. The ACOG risk management process has two elements to it: a horizon scanning risk management function; and a programme risk management function. Both elements also record and reflect opportunities that may arise during the programme. The Horizon risks are predominantly the longer-term strategic risks to airspace modernisation. These risks are set in the wider context outside the immediate scope of the Masterplan and the Programme. Critically, these risks are not “owned” by ACOG owing to their strategic nature but could potentially affect the conduct of the Programme and the achievement of benefits. By their nature, the risks tend towards externalities such as policy, regulation and environmental risks that must be managed by careful collaboration with those stakeholders with accountability for the mitigations, such as the DfT and CAA.
26. The ACOG Steering Committee regularly reviews the horizon scanning risk register to consider the appropriate management approach. Although the risks are by and large tolerated by ACOG for now, by adopting a modular approach to the programme, ACOG has sought to minimise the risk to the overall deployment strategy and benefits realisation. The modular approach has segregated the 22 airports into four individual deployment clusters and this helps to contain risks to a specified region of the UK without creating a domino effect on the whole national programme. Where a “tolerate” approach has been judged to be insufficient, ACOG has engaged with stakeholders such as the CAA and DfT to work with risk owners to put mitigations in place.
27. The second element, the programme risk register, contains risks that directly affect the preparation of the Masterplan and ACOG’s ability to deliver the Programme. These risks are actively managed through the internal ACOG team risk management process. An independent ISO90001 accreditation audit identified the ACOG team risk management process as best practice and well above the ISO standard.
28. A summary of the key horizon scanning and programme risks are set out in tables 6 and 7, along with an overview of the management approach.

TABLE 6: Summary of horizon scanning risks and management approach

#	Horizon scanning risks	Management approach
1	Key parties (e.g. airlines, airports and ANSPs) that are required to invest in complementary changes to deliver airspace modernisation are unable or unwilling to produce viable and coherent business cases, which leads to the fragmentation of the Masterplan and the Programme.	With the government grant funding (that allowed the airports to manage through COVID) ceasing from Apr 2023, this risk may become more pertinent during 2023/24, and

	<p>Maintaining balanced industry investment in airspace modernisation over multiple years with 22 airport-led ACPs in the Programme remains high risk owing to the fluctuating nature of airport revenues as the after-effects of COVID continue to play out.</p>	<p>ACOG continues to look for additional funding sources for airports that are unable to maintain their investments.</p>
<p>2 Due to increasing demand for scarce airspace capacity from both conventional and rapidly growing portions of the sector, there is a risk that the modernisation approach to integrating diverse users does not meet the operational requirements of new entrants such as remotely piloted aircraft systems and air taxis.</p> <p>The proliferation of airborne and ground technology solutions intended to support airspace integration compounds this risk by creating a lack of alignment that could result in a sub-optimal airspace design and an inability to integrate to internationally recognised standards.</p> <p>ACOG is working to ensure that any adverse impacts on airspace users are mitigated to the greatest extent possible and opportunities are identified for greater integration into the UK's airspace.</p>	<p>ACOG engages with a diverse mix of users regarding their evolving requirements for airspace access and integration. In Q2-22, ACOG appointed the ex-Head of the CAA General Aviation Unit as its stakeholder manager specifically to understand the needs of these sectors and report formally in the next iteration of the Masterplan in 2023.</p>	
<p>3 There is a risk that new policy guidance or a legislative mandate regarding the environmental performance of aviation, especially focusing on emissions, air quality and noise, may impact the development and deployment of an optimised Masterplan. This could be particularly relevant when trade-offs need to be made to limit adverse environmental effects caused by proposed airspace designs.</p> <p>Changes to policy or process that prompt a Judicial Review at either a regional or national level and have the potential to invalidate previous work on airspace modernisation or negate aspects of planned iterations of the Masterplan. The Strategic Environment Assessment and Habitats Regulation Assessment of the Masterplan, commissioned by the CAA, alongside the environmental impact analysis required of ACP sponsors as part of the CAP 1616 process, may compound this risk.</p>	<p>ACOG has developed Cumulative Analysis Framework guidance and tools that will enable trade-offs between these competing environment elements to be managed in a fair, transparent and equitable way. Where the toolkit demonstrates gaps in policy or guidance, this will be referred to the co-sponsors to remediate.</p>	
<p>4 There is a risk that insufficient resources across the sector to support the delivery phases of the Masterplan, results in fragmentation of ACP development and deployment within and across the clusters. The Programme would be unable to adhere to planned cost, time and performance milestones with concomitant delay to benefits realisation.</p>	<p>ACOG has worked with all stakeholders throughout this year to identify potential critical resource constraints and this has been reported to the co-sponsors, notably the CAA itself, where regulatory</p>	

		resource shortfalls continue to be addressed.
5	There is a risk that further modifications to the Airspace Modernisation Strategy that may result in a new delivery model across all components of the strategy, could absorb ACOG into a more complex and much broader programme of changes. The associated loss of agility and time taken to effect such a level of change might delay or adversely affect the current programme as changes take place and are bedded in. At the extreme, the ACOG delivery model could be compromised.	ACOG is working very closely with the co-sponsors to understand the intent and likely outcomes of the AMS refresh and has formally responded to all related consultations.

TABLE 7: Summary of programme risks and management approach

#	Programme risks	Management approach
1	<p>As a subset of the broader resource risk mentioned under horizon scanning (risk 4 in table 6), there is a risk associated with the size and complexity of the airspace changes required in the London and Southeast cluster.</p> <p>As the largest airspace change ever undertaken in one specific area, the ability of the CAA and industry stakeholders to provide the necessary resource to ensure multiple interdependent ACPs are assessed, approved and implemented in a cohesive, joined-up manner will be a complex and difficult task, spanning multiple years.</p>	The CAA Airspace Regulation team has been taking steps to address known resource shortfalls in these areas following last year's risk reviews and ACOG will continue to assist in identifying shortfalls across the sector where appropriate.
2	<p>A key risk that is likely to span several years is that of programme compression ie. as a result of ACPs failing gateways; financial/liquidity issues; judicial review/local planning issues; environmental issues; or other delays to the programme that results in the "bunching up" of ACP clusters on the programme timeline.</p> <p>The Masterplan could suffer programme compression to the extent that the major changes required for modernisation could become undeliverable, with the benefits not realised in time or indeed at all in some instances.</p>	ACOG has built-in contingency to the plans by cluster and this is proving resistant to compression. We will continue to actively monitor this risk and in extremis could seek to deliberately defer aspects of the Programme if they might compromise overall delivery. Currently, this is not judged to be a required mitigation.
3	Due to uncertainty about future airport developments and the scope and timeframes of plans to introduce additional runway infrastructure in the South-East of England, there is a risk that the airports and NERL are unable to fully determine the scope of the ACPs required for airspace modernisation in the London Terminal Maneuvering Area and the nature of the interdependencies between them.	ACOG are currently working with NERL and the LTMA airports to agree on a design and deployment strategy for the LTMA that should be agreed in 2023. This should significantly reduce the design

	<p>risk associated with the currently planned programme.</p>
<p>4 Due to the refresh of the Airspace Modernisation Strategy, of which the Masterplan is only a part, there is a risk that the scope of the ACOG delivery model is expanded to include other elements of modernisation.</p> <p>Although no firm plans have been announced, the potential exists for ACOG to be given greater scope and responsibility for delivering the AMS. There is a significant risk that unless ACOG was fully funded and able to grow both capability and capacity to resource these additional responsibilities, there could be an as yet unquantified effect on the core Programme.</p>	<p>ACOG continues to engage with the co-sponsors on their plans and intentions in order to advise on its requirements were the scope to increase as described.</p>

4. Finance

29. The ACOG budget is funded through the NERL portion of the UK en route unit rate. As an independent and impartial organisation, ACOG has discretion in performing its duties and authority over the use of its budget. The ACOG Steering Committee monitors ACOG's financial performance and NERL retains "arms-length" oversight of ACOG's activity via its regulatory licence requirements. ACOG's budget includes the costs of its resources, external suppliers and discretionary spend. The costs associated with some supporting functions, including premises, payroll and resources, are absorbed by NERL and not presented here.
30. ACOG achieved 21% savings in 2022, as a result of actively delaying recruitment to align with the pace of remobilisation of the Programme, deferring external spend in line with the production of key deliverables and general efficiency savings. As we enter 2023 with a fully remobilised programme it is anticipated that ACOG resources will return to their full complement.
31. Table 8 sets out the budgeted, forecast and actual costs associated with ACOG's activities for the fiscal years 2021 to 2027.

TABLE 8: Budgeted, forecast and actual costs associated with ACOG's activities, 2021 - 2027

	2021	2022	2023	2024	2025	2026	2027
Actual	£2.7m						
Forecast		£2.8m	£3.8m	£3.9m	£4.0m	£4.2m	£4.4m
Budget	£3.0m	£3.7m	£3.8m	£3.9m	£4.0m	£4.2m	£4.4m

* The CAA will provide the final determination of the NERL business plan (NR23) in the Summer of 2023