Future Airspace Strategy Implementation- ScTMA

Gateway Documentation:

Stage 3 Consultation Document

ACP-2019-74

NATS

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Roles

Action	Role	Date
Produced	Airspace Change Specialist Airspace Change Compliance & Delivery	August 2025
Reviewed Approved	Manager Airspace Change Compliance & Delivery Airspace Change Compliance & Delivery	August 2025
Reviewed Approved	Airspace Implementation Manager Airspace & Future Operations	August 2025
Reviewed Approved	Head of Airspace Development Airspace & Future Operations	August 2025

Change History

Issue	Month/Year	Changes this issue (most recent first)
Version 5.0	January 2026	The following sections have been updated following a typographical error, 3% was written instead of 3° (Highlighted), relating to the descent gradient used to design the option: • 6.2.5. • 6.2.16. • 6.2.17. • Q15 of the questionnaire.
Version 4.0	August 2025	Section 8 updated to remove duplication of Scottish Airspace Modernisation sponsor list and inclusion of a systemwide monetised benefit value. Note added to section 3.12 on implementation timeframe,
Version 3.0	August 2025	Updated following Cluster Gateway July 2025 including: • Change history Added. • Consultation Dates updated. • Number of FASI airports updated to eighteen following the withdrawal of Manston and Exeter. • Appendices referenced in 2.73 and 2.74 updated. • Inclusion of an explanation explaining why 2023 is used as the base year in traffic forecasts. • Inclusion of a new section summarising the benefits of Scottish Airspace Modernisation.
Version 2.5	July 2025	Updated document relating to an identified design error relating to the STRAT SID from Edinburgh airport
Version 2.0	December 2024	Updated Document following Gateway Feedback. Updates include: • Improved referencing of figure data. • Document has been checked for consistency against airport submissions. • Clarification that the presented Fuel and CO_2e figures are for the cluster. • Clarification provided that Glasgow Prestwick does not need a separate ACP. • Releasing CAS has been changed to Re-classifying CAS throughout. • Traffic Data updated. • "Conflicts" have been defined.
Version 1.0	August 2024	Original submission to CAA for Gateway Assessment.

Referenced Documents

Ref No	Name and description	Links
1	Future Airspace Strategy Implementation- ScTMA- Progress through CAP1616	LINK
2	Stage 1: Assessment Meeting Presentation	LINK
3	Stage 1: Assessment Meeting Minutes	LINK
4	Stage 1: Design Principles	LINK
5	Stage 2: Design Options and Evaluation	LINK
6	Stage 2: Initial Options Appraisal including Safety Appraisal	LINK
7	Stage 3: Consultation Strategy	LINK
8	Stage 3 Full Options Appraisal	LINK
9	CAP1616 Edition 5: Airspace Change Process	LINK
10	CAA Airspace Modernisation Strategy (CAP1711)	LINK
11	CAP1385: CAA Policy on Performance-based Navigation (PBN): Enhanced Route Spacing Guidance	LINK
12	SARG Policy 126: Policy for the Design of Controlled Airspace Structures	LINK
13	UK Government Department for Transport's 2017 Guidance to the CAA on its environmental objectives when carrying out its air navigation functions, and to the CAA and wider industry on airspace and noise management (abbreviated to ANG2017)	LINK
14	SARG Policy 133: Policy for the Establishment and Operation of Special Use Airspace	LINK
15	CAP1617: Planned and Permanent Redistribution of Air Traffic	LINK
16	CAP785B: Implementation and Safeguarding of Instrument Flight Procedures (IFPs) in the UK	LINK
17	SARG Policy 117: Policy for ATS Provision Within Controlled Airspace by Units not Notified as the Controlling Authority	LINK
18	ICAO Annex 11 to the Convention of International Civil Aviation: Air Traffic Services	LINK
19	Airspace Change Masterplan Iteration 3 Scotland	LINK

1. Executive Summary

1.1 The Scottish TMA Airspace Change.

1.1.1 The Scottish Terminal Control Area (ScTMA) Airspace change, sponsored by NATS En-Route Ltd. (NERL), is seeking to modernise the air traffic services (ATS) route network in and around the ScTMA above 7,000 ft as part of the Scottish Airspace Modernisation program of work. The area of change is shown in Figure 1.

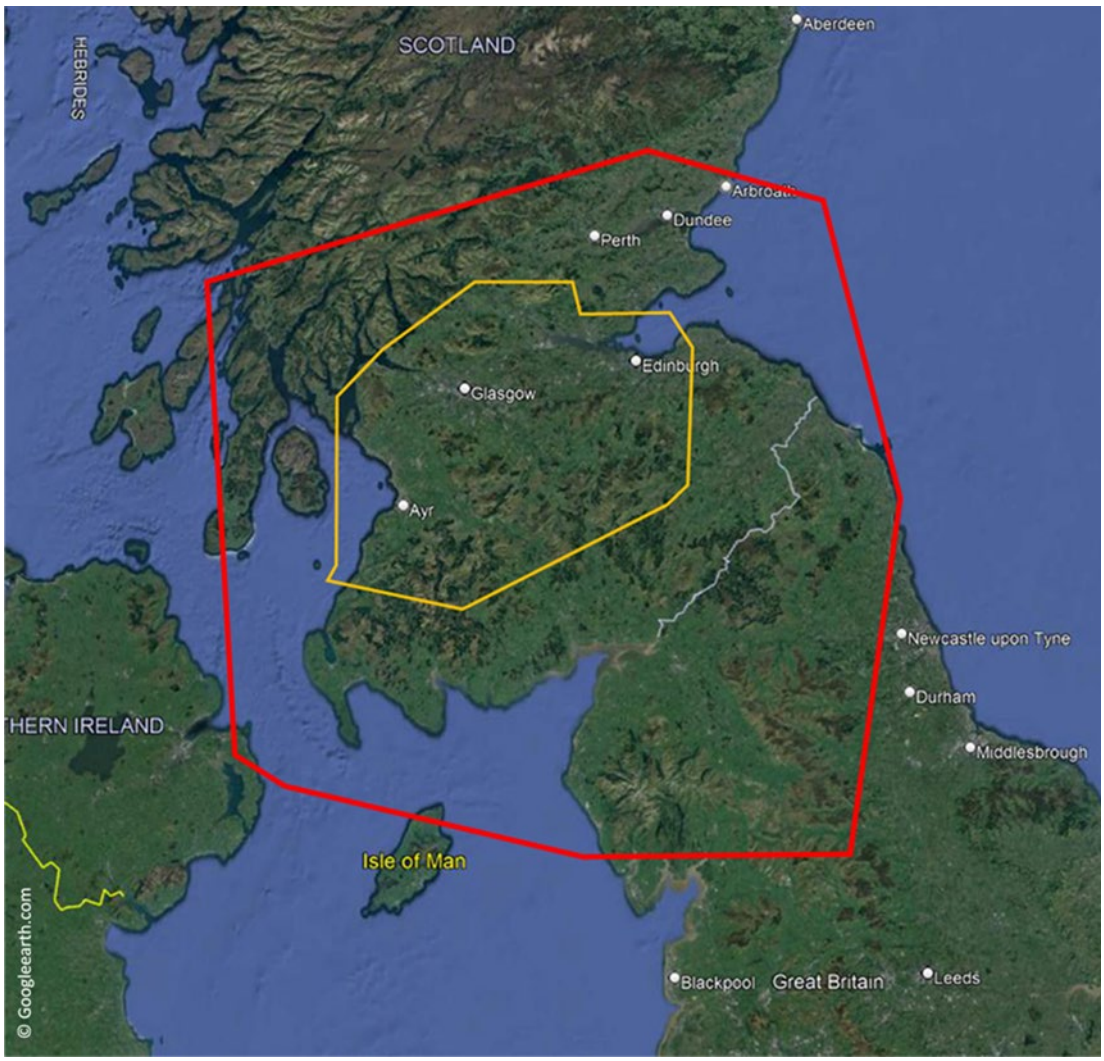


Figure 1: Lateral extent of the NERL sponsored ScTMA ACP changes (Red Shape) and the extant ScTMA (Orange Shape).

1.1.2 This change is part of a collaboration between Edinburgh Airport and Glasgow Airport who are redesigning their arrival and departure routes connecting the airfields to the ATS route network below 7,000 ft and NERL, the Air Navigation Service Provider (ANSP) for the airspace above 7,000 ft. Collectively, this collaboration is known as Scottish Airspace Modernisation. This program seeks to modernise the UK's airspace and air transport route network. It is an important part of the UK Government's transport policy and involves airlines, airports, air traffic control and many other aviation stakeholders. The changes described herein are aligned with the DfT's and CAA's Airspace Modernisation Strategy (Reference 10).

1.1.3 Today's ATS route network has evolved over time but has not undergone a complete redesign since its implementation. It has remained largely unchanged since the 1950s when there were fewer than 1m flights per year in UK airspace, compared with 2.5m in 2019 and projections of 3m by 2030. Subsequently, the existing airspace does not take advantage of modern navigational technology nor the improved performance capabilities of modern aircraft.

Therefore, the location of conventional ATS routes is constrained by the location of existing ground-based navigation aids and the historic performance of aircraft limiting the efficiency of the airspace.

1.1.4 Modern Performance Based Navigation (PBN) takes advantage of "new" technology, removing the dependency of the route network on ground-based navigation aids facilitating optimised trajectories. Aircraft navigate PBN routes with a greater accuracy, which enables efficient airspace design. This reduces workload per flight whilst increasing capacity and efficiency overall, enabling environmental benefits.

1.1.5 This Airspace change is aligned with the previously developed CAP 1616 Statement of Need (Stage 1) and seeks to modernise ScTMA by introducing a modern PBN based airspace design within this area. A PBN based design will:

- Remove the dependency on ground-based navigation aids
- Enable improved track conformance to routes permitting the distance between routes to be safely minimised based on CAP1385 requirements
- Optimise the routings available allows the introduction of systemised routes which will reduce the amount of tactical intervention required, within a given piece of airspace
- Enable environmental benefits
- Minimise Controlled Airspace (CAS) volumes.

1.1.6 In addition to modernising the existing ATS network, this ACP proposes the introduction ScTMA arrival and departure routes overhead the Firth of Forth. These routes will offer substantial benefits over existing connectivity including:

- Providing direct connectivity between Free Route Airspace (FRA) and the ScTMA for aircraft arriving and departing from/to the east
- More direct routing options enabling fuel savings for carriers
- More direct routing options enabling environmental benefits
- Reduces complexity in the south of the ScTMA increasing efficiency and capacity
- Facilitates a reduction in land overflight below 7,000 ft for the Edinburgh operation.

1.1.7 In collaboration with Edinburgh Airport and Glasgow Airport, the redesign of the NERL impacted airspace includes redesigning the arrival procedures into the airfields. Existing orbital holding areas (holds) have been relocated and new holds proposed so that they are optimally located between the network design and airports IAPs. New Standard Arrival Routes (STARs) have been proposed to link the network to these optimised holds.

1.1.8 In addition, updated connectivity to the network has been proposed for aircraft departing the airfields.

1.1.9 NERL have taken this opportunity to perform a thorough review of the CAS required in line with the latest containment guidelines described in the Policy for the Design of Controlled Airspace Structures (Reference 12), and our operational procedures, to deliver benefit to other airspace users where possible. The introduction of the Firth of Forth routes will require a substantial volume of additional CAS, ~1332.6 NM^3 to deliver its benefits. However, the system wide redesign has identified that NERL are able to release ~673.8 NM^3 of CAS elsewhere in the ACP to Class G, resulting in a net CAS gain of ~658.8 NM^3. In addition, there is a reduction in Class A airspace of ~5296.2 NM^3 resulting in improved access for general aviation (GA) [1].

1.1.10 The changes described within this document set and within the other Scottish Airspace Modernisation sponsors consultations are expected to enable fuel savings of 6 kT in 2027 raising to 8 kT in 2036. This equates to a CO_2e saving of 18 kT in 2027 raising to 24 kt in 2036. As well as the fuel and CO_2e savings, this design should deliver capacity benefits through the introduction of a modern systemised airspace design.

[1] Class A is the most restrictive type of airspace, which can be too restrictive for GA pilots. Therefore, reducing the volume Class A airspace improves access to GA. For more information of airspace classification, see Chapter 3.5.

1.1.11 The Design Principles (see para. 2.14 and Reference 4) which were developed with stakeholders at Stage 1, form a comprehensive list of objectives which the proposed design should aim to meet. The changes proposed are all at or above 7,000 ft hence, in accordance with UK Government guidance, mitigation of noise impacts to stakeholders on the ground is not prioritised (Reference 13 para 4.1d). Due to the altitude of the proposed changes, assessment of environmental impacts is limited to greenhouse gas emissions, assessed by the 'CO_2 equivalent' (CO_2e) metric. Any impact below 7,000 ft is included and assessed within the corresponding airports stage 3 submission. Previous CAP1616 stages have summarised the design options development (Reference 5 and 6). A single NERL design option is being progressed to consultation.

1.1.12 The "do-nothing" option has been discounted as it does not modernise the airspace and did not meet the progression requirements set for the Design Principle Evaluation (DPE). However, the current airspace is the baseline against which all proposed changes are measured, hence it is included for comparison purposes. There is still scope for feedback on the specific details of the design options upon which we are consulting – the removal of other options does not remove the scope for formative feedback.

1.1.13 The purpose of this consultation is to ensure that stakeholders who could be positively or negatively affected by these changes, are made aware of this ACP and given the opportunity to submit feedback about the designs. Through our engagement activities undertaken so far, we have sought to ensure that:

- The correct audience is targeted in an appropriate manner and given the opportunity to respond
- The consultation materials we produce provide stakeholders with enough detail to make an informed response
- The duration of the consultation is appropriate.

1.1.14 This consultation begins on 00:01 hrs 20 October 2025, and ends 23:59 hrs 25 January 2026 (14 weeks).

1.1.15 This consultation document and the associated response questionnaire are freely available via the CAA airspace change consultation portal at:

- https://consultations.airspacechange.co.uk/nats/sctma

1.1.16 The consultation portal also includes the following useful materials:

- Links to the Scottish Airspace Modernisation Microsite
- FAQ document to give answers to frequently asked questions
- Feedback questionnaire
- Links to all supporting material.

1.1.17 If the proposal is approved by the CAA, implementation of the airspace change would occur after Q1 2027.

2. Introduction

2.1 About this Document, Scope and Background

2.1.1 This Airspace Change Proposal (ACP) is sponsored by NATS En-Route Ltd, (NERL) which is the provider of Air Traffic Services within the En-route network. Today's Air Traffic Services (ATS) route network has evolved over time but remained largely unchanged since the 1950s when there were fewer than 1m flights per year in UK airspace, compared with 2.5m in 2019 and projections of 3m by 2030 and does not fully exploit modern navigation technology or modern aircraft performance. The objective of this ACP is to modernise the route network surrounding the Scottish Terminal Control Area (ScTMA) in accordance with the Civil Aviation Authority's (CAA's) Airspace Modernisation Strategy (AMS) using Performance Based Navigation (PBN). This will enable capacity benefits by resolving routine conflicts through systemisation, whilst also providing a reduction in fuel burn and CO_2e emissions.

2.1.2 This document forms part of the document set required in accordance with the requirements of the CAP1616 Airspace Change Process. This document aims to provide adequate evidence to satisfy Stage 3 Consult Gateway, Draft Consultation Document.

2.1.3 For previous stages of the airspace change process, including the Statement of Need (SoN), design principles and design options please see the CAA website detailing the progress of this proposal.

2.2 Scottish Airspace Modernisation and the Co-ordinated Consultation

Background

2.2.1 The Airspace Change Organising Group (ACOG) was formed in 2019 under the direction of the UK Government Department for Transport (DfT) and Civil Aviation Authority (CAA), who co-sponsor and regulate airspace modernisation. ACOG is tasked with developing the UK Airspace Change Masterplan (the Masterplan), with oversight from an impartial Steering Committee of senior representatives drawn from across the aviation sector. More information is available on ACOG's website, www.acog.aero.

2.2.2 The UK's airspace is being upgraded as part of the UK Government's airspace modernisation programme. This includes redesigning the arrival and departure routes that serve many of the UK's airports. Airspace modernisation will be delivered, in part, through a series of linked ACPs. Eighteen of the UK's airports are sponsoring ACPs to upgrade the arrival and departure routes that serve their operations in the lower airspace (below 7,000 ft). NERL, the UK's licensed Air Navigation Service Provider for en route operations, is currently sponsoring seven ACPs to upgrade the route network that sits above 7,000 ft, in busy portions of airspace where there are lots of climbing and descending flights, referred to as Terminal Control Areas (TMAs).

The Airspace Change Masterplan

2.2.3 Airspace modernisation is a complex programme, with many organisations working together on a single coordinated implementation plan out to 2040 – the Masterplan. The changes that make up the Masterplan will upgrade the UK's airspace and deliver the objectives of the Government's AMS.

2.2.4 The Masterplan is organised into four regional clusters so that the simpler airspace changes can be deployed sooner, realising benefits earlier. The timelines for making airspace changes are generally shorter for the simpler clusters where there are fewer airports and less complex interdependencies between the airport ACPs.

Scottish Airspace Modernisation

2.2.5 NERL's ACP forms part of a wider Scottish Airspace Modernisation proposal. This is formed between Glasgow Airport, Edinburgh Airport and NERL. Within The Masterplan, it is referred to as the Scottish Terminal Control Area (ScTMA) cluster.

2.2.6 Edinburgh Airport and Glasgow Airport are responsible for the modernisation of their departure and arrival routes below 7,000 ft and the airports Controlled Airspace. NERL are responsible for connecting these routes into the network airspace, and the wider route network above 7,000 ft.

2.2.7 The three ACPs are being progressed independently however there are design interdependencies between the proposals i.e. a change to Glasgow Airport's design may result in a knock-on change for NERL and/or Edinburgh Airport.

2.2.8 This means that Edinburgh Airport, Glasgow Airport and NERL, coordinated by ACOG, have worked closely together to develop the Scottish Airspace Modernisation proposal. It also means that for some stakeholders, such as Airlines and General Aviation, there will be coordinated consultation events to present the overall proposal.

2.2.9 This Consultation Document focuses on the proposed changes which form part of NERL's ACP. However, ACOG have published several documents that present information about the development and outcomes of the system wide Scottish Airspace Modernisation proposal. As we progress through this document, we will provide information and links to the relevant ACOG documentation which shows how the NERL proposal fits within the wider system design.

2.3 About this Airspace

2.3.1 The area covered by this ACP is shown in Figure 1, encompasses the extant ScTMA and surrounding airspace. This area covers the southern portion of Scotland (approximately south of a line connecting Montrose – Oban) and the northern portion of England (approximately north of a line between Barrow in Furness – Woodale – Newcastle).

2.3.2 In December 2021 NERL introduced the first deployment of Free Route Airspace (FRA) into UK airspace. This airspace structure extends from FL255 (~25,500 ft) up to FL660 (~66,000 ft, see Figure 2) and covers the North, West, East and South-West portion of the lateral limits of this change.

2.3.3 FRA Deployment 3 is planned to complete the introduction of FRA within the Scottish Air Traffic Control Centre Area of responsibility and is expected to be implemented prior to the introduction of the ScTMA changes described herein. It is therefore assumed to already exist in this document set; however, if this does not occur then connection to upper routes will be retained until such time as they are removed by FRA introduction.

2.3.4 Below FRA there is the lower airspace FL70 (~7,000 ft) – FL255 (~25,500 ft). This airspace routinely accommodates flights arriving to and departing from several airports within the area, including Edinburgh, Glasgow, Dundee and Glasgow Prestwick airports.

2.3.5 The airspace provides connectivity to the northerly North Atlantic Tracks (NATs) as well as airports located in the north of Scotland.

2.3.6 In 2019, there were approximately 331,000 traffic movements within this airspace. Due to the impact of the Coronavirus pandemic on the aviation industry, the number of flights significantly reduced across the whole of the UK and Europe during the 2020 to 2022. UK air traffic started to recover in 2022 with traffic raising to approximately 83% of 2019 levels and in 2023 it had recovered to 92% and continues to recovery. Previously, demand for air travel across the UK had been increasing faster than predicted.

2.3.7 The objective of this project is to update the route network to deliver specific initiatives of the AMS. The proposed changes seek to introduce a systemised network of ATS routes utilising PBN. This will enable aircraft to navigate using modern navigation capabilities and not be constrained by ground-based navigation beacons and will enable safety and environmental benefits whilst increasing capacity.

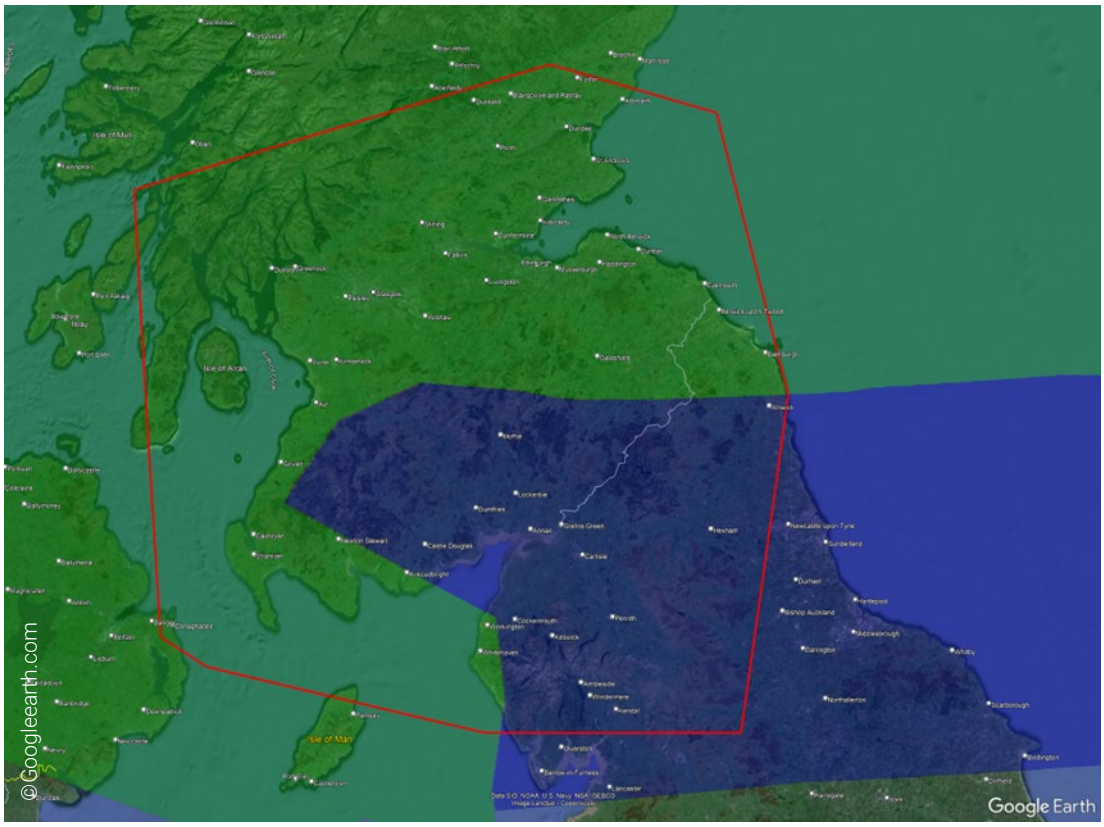


Figure 2: Location of existing UK FRA airspace (green polygon), planned FRA (blue polygon) and the lateral limits of this ACP (red polygon)

2.4 Why must this change happen now?

2.4.1 NERL is mandated to make changes to the ScTMA in line with the AMS, see Section 2.12.

2.4.2 The en-route network has evolved over many years and has been defined by the use of ground-based navigation beacons. Improvements in navigation technology (e.g. satellite-based navigation) have removed these constraints and hence it is possible to undertake a complete redesign of the route network within the fixed constraints of the design. This includes, but is not limited to, the lateral limits of the ACP (some connectivity modifications are required at high level outside of these limits), Special Use Airspace (SUA), and the surrounding airspace.

2.4.3 This proposed change aims to give benefits in safety, environment, efficiency and capacity. Undertaking such a fundamental redesign of the airspace is considered a once in a generation opportunity and will secure efficiencies and benefits for many years to come.

Increasing Capacity

2.4.4 The number of airspace users using the UK airspace is forecasted to increase significantly in the coming years. If the airspace is not upgraded, it will not be able to accommodate this growth, leading to increased delays and congestion. This airspace change proposal will introduce modern routes and systemisation that should increase the effective capacity of the airspace to alleviate this problem. By optimising these routes, the airspace can accommodate more aircraft without compromising safety or efficiency.

Environmental Impact

2.4.5 Environmental considerations are central to the airspace change proposal. Modernising airspace can help reduce the environmental impact of aviation in several ways. Optimised flight paths can lead to significant reductions in fuel burn and CO_2e emissions. By allowing aircraft to fly more direct routes and maintain optimal altitudes for longer periods, fuel consumption is minimised, leading to lower greenhouse gas emissions.

Efficiency

2.4.6 The current airspace design can lead to congestion and delays, particularly during peak times. By redesigning flight paths and utilising advanced navigation technologies, the airspace can be used more efficiently through systemisation. This involves implementing PBN to improve the accuracy and predictability of flight paths, allowing for better management of air traffic and reducing the likelihood of delays.

2.5 About this Document.

2.5.1 This consultation document explains the history, impacts and benefits of the proposal. Two complementary documents provide more details on how this consultation will be conducted and how the options were appraised:

- Stage 3 Consultation Strategy (Reference 7), which provides details on how we will conduct the consultation
- Stage 3 Full Options Appraisal (Reference 8), which provides analysis for each option in comparison to the baseline, to quantify likely benefits/impacts.

2.6 Where are we in the Airspace Change Process?

2.6.1 The CAP1616 airspace change process is summarised in the flowchart below on the left. A new version of CAP1616 was released following successful completion of the Stage 2 gateway. Stages 1 and 2 of the process were completed using the previous version, Edition 4, of the CAP1616. Subsequent stages will be completed under Edition 5, which was published in January 2024. We are at Stage 3. Details of Stage 3 from CAP1616 Edition 5 is shown on the right:

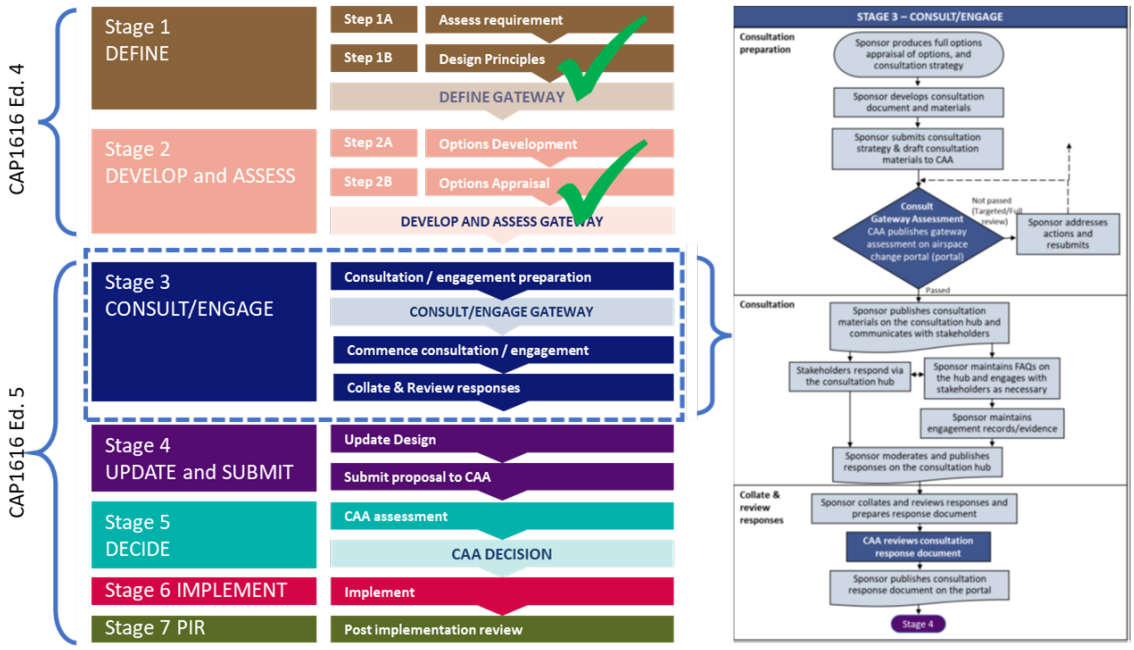


Figure 3: Airspace Change Process – Overview (left) and Stage 3 Consult (right).

2.6.2 Stage 1 Define has been completed, where the need for an airspace change was established. We engaged with representatives of stakeholder groups to develop and define the design principles underpinning this proposal.

2.6.3 Stage 2 Develop and Assess has also been completed, where initial design concepts were developed, refined with feedback from representatives of stakeholder groups, each concept evaluated against the design principles and an initial appraisal performed to illustrate the benefits and impacts of each concept. This crucial stage of the process removed the least suitable potential airspace concepts from further development: for example, those that were not

as safe, those that were sub-optimal for environmental impacts or those known not to be technically viable.

2.6.4 During Stage 2 of the airspace change process, NATS developed concept options which addressed the issues identified in the CAP 1616 Statement of Need (Stage 1). NATS categorised the concept options into 2 distinct areas:

- ATS route network between the lower airspace and Free Route Airspace (FRA) (FL70 to FL255)
- ScTMA airport connectivity (above 7,000 ft), including holds [2], arrival routes and departure connectivity.

2.6.5 The ATS route network area for the in-scope area shown in Figure 1 was subdivided into 6 distinct geographical elements and concept solutions were proposed for each element, see Figure 4.

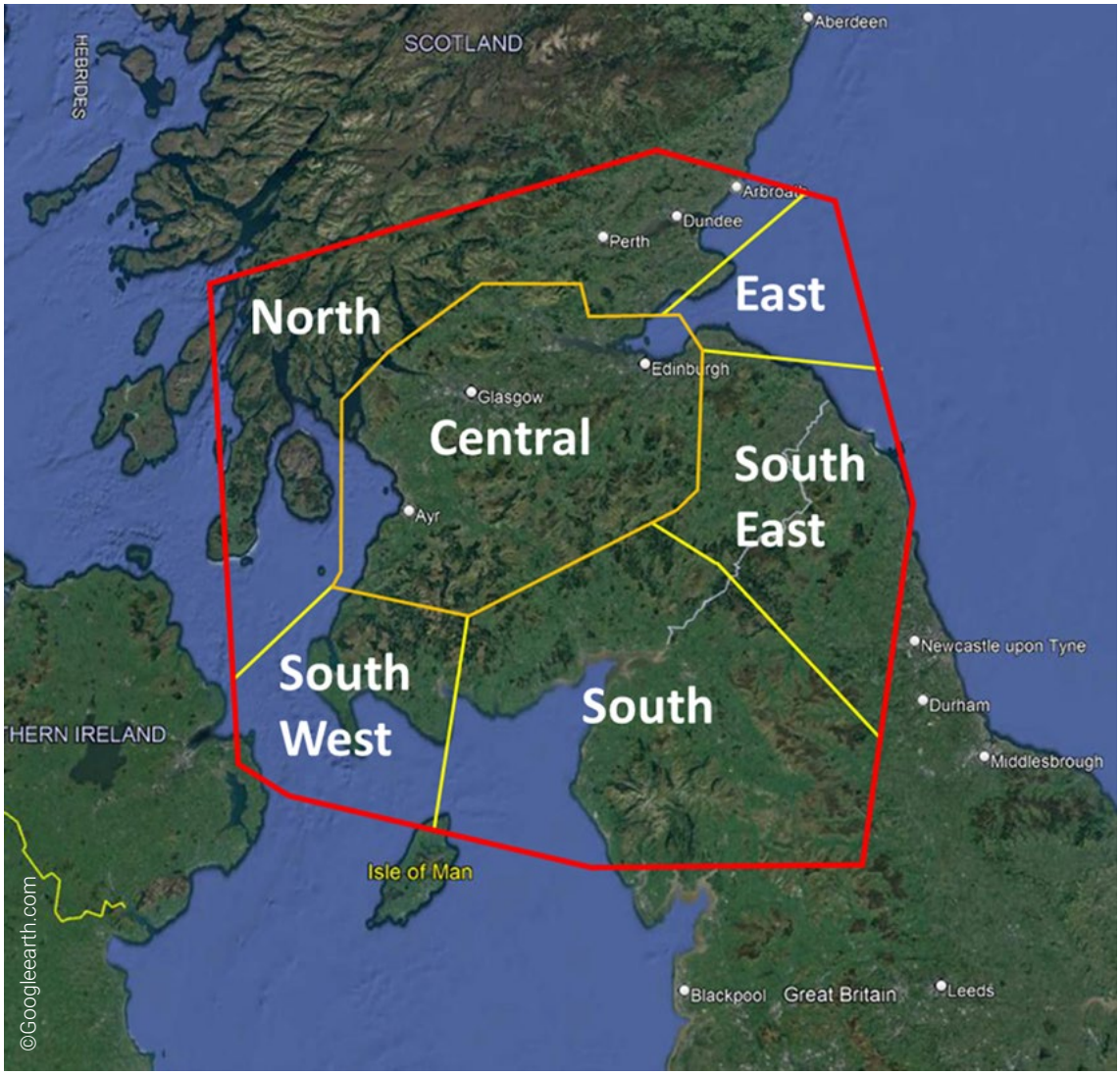


Figure 4: Geographic Lateral limits of each option element area.

2.6.6 The ScTMA Airport Connectivity area was subdivided into elements which:

- Provided connectivity to Standard Instrument Departure (SID) end points
- Provided connectivity to airport arrival structures
- Airport arrival structures, i.e. holds.

[2] When not specified the word "hold" refers to any delay absorption structure.

2.6.7 Supporting documentation for this proposal (including Stage 1 and Stage 2) can be found on the CAA's airspace change portal by clicking on this link.

2.6.8 The concepts for each element which remained following the Stage 2 shortlisting have been used to develop, in collaboration with our airport partners and impacted stakeholders, a single system wide design option which will be consulted on.

2.6.9 This document will describe how the system wide design option was created from the Stage 2 design concepts and confirm that the concepts are compatible with one another.

2.6.10 The proposed single design option provides a viable airspace solution which addresses the SoN and is aligned with the UK's AMS (Reference 10).

2.6.11 This proposal is now at Stage 3 Consult, where stakeholders are asked for feedback on the proposed design option.

2.7 Stakeholders

2.7.1 A stakeholder is a third party interested in an ACP. This ACP is proposing changes to routes and Controlled Airspace (CAS) throughout the region depicted in the Stage 2 Design Options and Evaluation Document (Reference 5) above 7,000 ft (~FL70). Due to the altitude of the changes proposed, the primary focus of this (NERL) consultation are aviation stakeholders, and this document uses common aviation technical language.

2.7.2 The primary stakeholder groups for this consultation are:

- Aircraft Operators such as airlines, cargo operators, and business aviation (accounting for 70% of traffic departing Edinburgh Airport and Glasgow Airport)
- Airports, including Edinburgh and Glasgow
- Ministry of Defence (MoD)
- Relevant National Air Traffic Management Advisory Committee (NATMAC) Members.

2.7.3 The stakeholders proactively targeted by NATS for involvement in this consultation are listed in Appendix B of the Consultation Strategy (Reference 7). However, any other interested parties may participate in this consultation and feedback is welcomed from any individual or organisation.

2.7.4 This consultation is aimed at an audience of aviation stakeholders, hence some language used in this document includes commonly understood aviation terms without further explanation. A Glossary of Terms is provided in Appendix A: Glossary.

2.8 Combining ACPs

2.8.1 Two en-route ACPs were originally submitted by NERL to make changes to the en-route route network serving the ScTMA. These were split to address the route network serving:

- Edinburgh Airport
- Glasgow Airport.

2.8.2 As the design options for each ACP were being developed, NERL identified that the design options being discussed for the two NERL ACPs were fully entwined and dependent upon each other. This meant that each ACP would only tell half the story and it would be simpler to present and understand if these changes were combined into a single submission incorporating all the ScTMA en-route network changes. NERL initiated combining these ACPs towards the end of 2021. This involved:

- Confirming the Statements of Need for both ACPs were aligned
- Confirming the Design Principles for both ACPs were aligned
- Confirming ACOG, the CAA, Edinburgh and Glasgow airports agreed with the proposal to amalgamate the 2 ScTMA en-route ACPs
- Confirming our stakeholders had no objections to the proposed amalgamation of these ACPs.

2.8.3 NERL formally combined the en-route ACPs on 25 March 2022. Owing to the similarities between the Edinburgh and Glasgow en-route ACPs it was agreed between NERL and, the CAA that this work would continue using the original Edinburgh en-route ACP portal page and Statement of Need, (ACP-2019-74). However, the portal page would be renamed Future Airspace Strategy Implementation – ScTMA.

2.9 Categorisation Level.

2.9.1 The changes included within this submission are to the en-route airspace, at and above 7,000 ft [3]. In line with the guidance set out in the CAP1616, the CAA has categorised this ACP as a "scaled" Level 1 change. NERL acknowledges and agrees that this ACP has the potential to alter tracks below 7,000 ft. However, as NERL has worked collaboratively on the development of a systemwide design with Edinburgh and Glasgow airports who are pursuing independent FASI ACPs concurrently to this one to amend the procedures contained within the low level (below 7,000 ft airspace), NERL considers that it would be disproportionate to consider and duplicate noise impacts within this ACP. Considering this, NERL proposed the following scaling at Stage 2 and will apply these during this ACP:

2.9.2 NERL intends to:

- Continue to work closely with airport stakeholders on options development and, as changes are being progressed by an airport, provide support to their consultations (where requested and appropriate)
- Continue to engage with airport stakeholders to determine the suitability of hold locations and SID connectivity points
- Consult with relevant identified stakeholders on the proposals for change to the en-route network above 7,000 ft
- Describe the portion of the proposed airport procedures that are above 7,000 ft
- Produce en-route network CO_2e emissions analysis.

2.9.3 NERL does not intend to:

- Consult on routes below 7,000 ft
- Proactively consult local communities.

2.9.4 NERL proposed in their Stage 2 documentation, not to "produce noise analyses (unless related to ATS route changes below 7,000 ft above mean sea level (amsl) not within the scope of one of the FASI-N associated airport ACPs)." There are no such ATS route changes proposed below 7,000 ft amsl. However, NERL remains cognisant that there is high terrain beneath the ScTMA, and therefore some procedures arriving at the airfields may be below 7,000 ft above ground level (agl), for example when aircraft are holding. However, holding is infrequent, and the expectation is that the design will further reduce this holding.

2.9.5 Due to the infrequency of holding, the height at which aircraft would be held as well as the type of aircraft utilising the airspace, any noise analysis undertaken would offer limited benefit. A quantitative assessment of the potential population and any national parks, national scenic areas overflown by holding aircraft will be provided, as well as a qualitative assessment of the noise impacts should an aircraft be holding would be far more informative and will be provided.

2.9.6 Edinburgh Airport and Glasgow Airport will provide an in-depth quantitative analysis for overflight below 7,000 ft amsl between the hold location and the airports for their respective procedures.

[3] See DfT Air Navigation Guidance 2017 (Reference 14).

2.10 Scope of this Consultation and Link with the Corresponding Airport ACPs

2.10.1 This ACP seeks to reduce conflicts [4] within the ScTMA and surrounding airspace by modernising the UK ATS route network in and around the ScTMA structure.

2.10.2 This will be achieved by introducing a systemised airspace design, which aims to separate arriving and departing aircraft using proscribed vertical and lateral separation minima. This reduces the requirement for ATC to intervene.

2.10.3 This airspace design will provide a safe and efficient interface with the surrounding airspace whilst adhering to required containment and separation policies.

2.10.4 The existing airspace has evolved over many decades and was influenced by the position of out-dated ground-based radio navigation beacons (known as DVORs & NDBs). NATS is in the process of rationalising the existing DVOR/NDB network and this proposal has been developed to remain compatible with this rationalisation programme.

2.10.5 NATS, by performing a thorough clean-sheet redesign of the network serving the ScTMA can achieve the objectives set in the Statement of Need, with the airspace becoming more efficient, yielding environmental benefit by enabling airline operators to reduce CO_2e [5] emissions per flight, which in-turn would give economic benefit due to reduced operating costs.

2.10.6 The ATS routes affected start at/above 7,000 ft (~ FL70). The proposal seeks optimal alignment and connectivity of the ATS route network with each airport's airspace structures, such that the network capacity should not be a significant constraint on airport capacity whilst still minimising environmental impacts.

2.10.7 Edinburgh Airport and Glasgow Airport are undertaking their own ACPs in order to modernise the lower-level (procedures partially contained below 7,000 ft) airspace, see Figure 5.

2.10.8 The airports are proposing new/updated departure routes and transitions (a connecting procedure between the hold and Final Approach Fix) for their operations. These procedures are within the airports sections of the Aeronautical Information Publication (AIP) and are operated by airport Air Traffic Control Officers (ATCOs). Therefore, these procedures are the responsibility of the airports.

2.10.9 The proposed airport procedures straddle the lower (below 7,000 ft) and en-route (at and above 7,000 ft) airspace and subsequently there were design decisions that were influenced by considering noise impacts (below 7,000 ft) and design decisions that were influenced by considering CO_2e impacts (at and above 7,000 ft).

2.10.10 At and above 7,000 ft NERL has a greater understanding of any interactions and how these may be resolved through the design and operation of this airspace. Therefore, it is considered prudent that NERL describes the portion of the airport procedure that is contained in the airspace at and above 7,000 ft, within which NERL provide an ATS. Any feedback received by NERL relating to this portion of the airports design will be shared with the corresponding airports and the designs updated collaboratively as appropriate.

2.10.11 Consultations for these ACPs are running concurrently and stakeholders are encouraged to respond to all pertinent consultations.

2.10.12 In order to integrate the arrivals/departures to/from Glasgow Prestwick Airport or other airfields within the impacted airspace into the proposed systemised enroute network it may be necessary to change/truncate and/or realign some STARs and procedures not covered by the above ACPs. These changes will not alter flights below 7,000 ft but will provide connectivity between remaining existing procedures and the proposed route network described herein. Any amendments to these procedures are included within this document set and will not require a separate ACP to be undertaken by the impacted airports.

[4] A conflict within the ATS airspace is a situation where there is a risk of loss of separation between aircraft requiring intervention by ATC. Conflicts most often occur at the confluence of ATS routes or within congested complex airspace such as a TMAs.
[5] CO_2e means carbon dioxide equivalent, which measures the impacts of all greenhouse gases by converting them to their CO_2 equivalent amount.

2.10.13 It should be noted that the FRA D3 area proposed by the separate FRA D3 ACP (ACP-2021-071) overlies the remaining ScTMA area not covered by existing FRA. FRA D3 is expected to be implemented prior to the changes described within and therefore this consultation document will consider this an existing feature of the airspace. However, if this does not occur then connection to upper routes e.g. above FL250 (~25,000 ft) will be retained until such time as they are removed by FRA introduction.

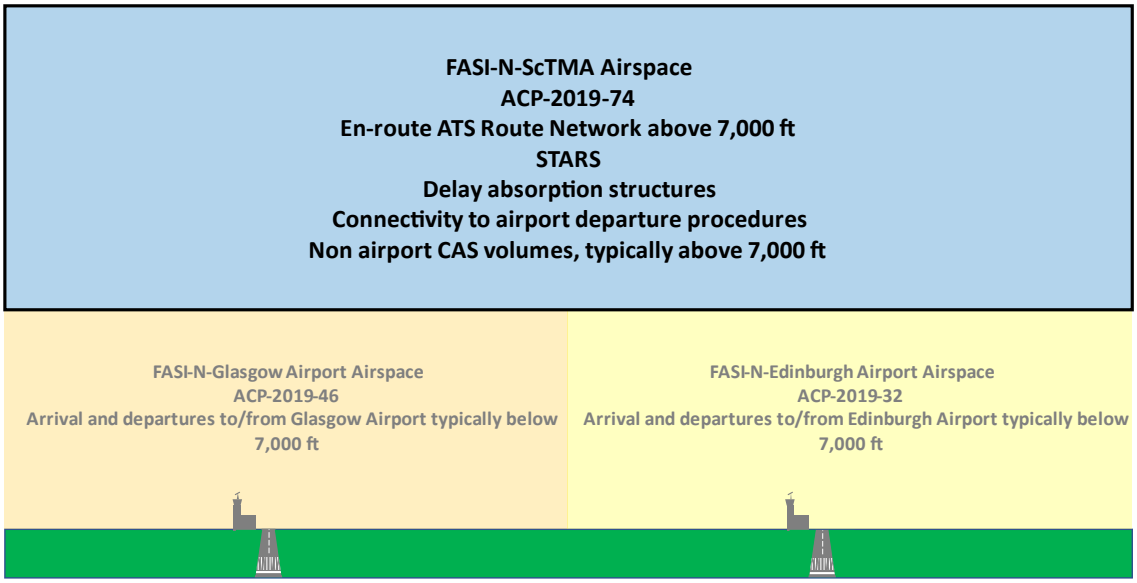


Figure 5: Illustration showing indicative airspace covered by the three ACP's.

2.11 Dependency Between the En-Route and Airports ACPs

2.11.1 The changes described within this document have been developed in parallel with the lower airspace airport led changes. Therefore, these changes assume the successful concurrent implementation of the finalised en-route airspace design and the lower airspace changes. The en-route and airport changes are dependent on each other.

2.11.2 Due to the complexity and separation requirements for the ScTMA airspace only a single option for the NERL airspace will be proposed. Changes to the proposed design are possible and will be considered following feedback received during the consultation. However, it should be noted that due to the interactions between routes, any update may ripple through the design to ensure the design remains safe and efficient and the submission of alternate options was not considered proportionate.

2.11.3 There is a separate document of FAQs available on the consultation portal. However, some key ones are included here. The en-route ACP (this one) and low-level airport led ACPs are dependent on and co-ordinated with each other. They are being run in parallel, with all three consultations being run concurrently. This ACP is dependent on the outcome of the airports consultation as this will determine the geographic interfaces for aircraft transitioning between the lower-level airspace (ACPs led by the airports) and the en-route airspace (ACP led by NATS), so this is a key dependency.

Do all three ACPs need to be implemented together?

2.11.4 Yes, the designs submitted will be the result of feedback from this consultation and are dependent on the successful implementation of all Scottish Airspace Modernisation ACPs.

What if there is a delay to an airports ACP?

2.11.5 The proposed timescales allow for a small delay to an ACP without impacting the system wide implementation date.

What if one or both airports withdraw their ACP?

2.11.6 This ACP seeks to modernise the en-route airspace in and around the ScTMA. Should one or both airports choose to withdraw their ACP, the ATS network could still be modernised and provide benefit to our stakeholders. Connectivity to/from the ATS route network will be

provided to departing aircraft via the remaining extant or new SID end points and by using existing transitions or vectoring aircraft from the holds to the runways. However, the potential benefits described herein may not be realised. The greater risk is that if one airport withdraws, this could have an impact on the other airports design. These designs will have optimally deconflicted the low-level interactions and the new design of one airport may not be operable with the extant design of the other. This could further limit the potential benefits realised through the modernisation of the ScTMA airspace. Therefore, if either Glasgow Airport or Edinburgh Airport withdrew their ACP, significant re-design and reassessment would likely be required.

Will the cumulative impacts of both ACPs be shared with stakeholders?

2.11.7 Yes, cumulative impacts and benefits for fuel burn and CO_2e are considered (in Section 7). To consider one ACP option in isolation may give apparently contradictory results, hence the combined benefits/impacts should be considered by the reader. This is essential in order to understand the impacts on the whole system and to see the "bigger picture".

2.12 Alignment with the Airspace Modernisation Strategy, and other Proposals

2.12.1 The UK Government has tasked the aviation industry to modernise airspace across the whole of the UK. The long-term strategy of the CAA and the UK Government is called the AMS (Reference 10). The 2018 AMS identified fifteen initiatives to modernise airspace. Initiative 1 (Direct Route Airspace) is complete. The remaining 14 initiatives have been subsumed into 9 new elements.

2.12.2 These include a fundamental redesign of the routes in and around the UK. This programme of modernisation in the northern UK is known as 'Future Airspace Strategy Implementation – North', or FASI-N. (It should be noted that this nomenclature highlighted alignment with the CAA's Future Airspace Strategy (FAS), which was the predecessor of the AMS. The FASI-N programme was initiative 5: 'a Terminal airspace redesign in Northern England and Scotland'.

2.12.3 Initiative 5 is now included within Edition 2 of the AMS as UK-Aircraft Based Navigation/2 (Terminal Airspace Redesign). It is fully aligned with the AMS and hence could similarly be described as Airspace Modernisation Strategy, Implementation – North.

2.12.4 More details on the AMS and FASI-N are available on the CAA website here and here respectively.

2.12.5 Table 1 below shows how this ACP will align with the objectives set out within the AMS.

AMS criteria	How this ACP aligns with the AMS
Safety: Maintaining and, where possible, improving the UK's high levels of aviation safety has priority over all other 'ends' to be achieved by airspace modernisation.	The incorporation of PBN systemised routes should lead to a more efficient airspace design with simpler, fewer conflictions. This should increase capacity while continuing to improve the current high safety standards.

AMS criteria	How this ACP aligns with the AMS
Integration of diverse users: Airspace modernisation should wherever possible satisfy the requirements of operators and owners of all classes of aircraft, including the accommodation of existing users (such as commercial, GA, military, taking into account interests of national security) and new or rapidly developing users (such as remotely piloted aircraft systems, advanced air mobility, spacecraft, high-altitude platform systems).	The design options included within this documentation are the result of extensive engagement with the impacted airspace users. This has ensured that: • Airspace access will be maintained or improved. • The airspace will be classified to support access to users as appropriate. • There is no conflict with national security requirements. The proposed designs will efficiently use the airspace to enable the expeditious flow of traffic, including all classes of aircraft across the commercial, GA and military sectors.
Simplification, reducing complexity and improving efficiency: Consistent with the safe operation of aircraft, airspace modernisation should wherever possible secure the most efficient use of airspace and the expeditious flow of traffic, accommodating new demand and improving system resilience to the benefit of airspace users, thus improving choice and value for money for consumers.	The design options described within this documentation introduce a systemised airspace design within the impacted airspace. This systemised airspace design should: • Reduce conflictions. • Reduce tactical ATC intervention. • Improve continuous climb operations (CCO) and continuous descent operations (CDO) operations. • Reduce Fuel burn and CO_2e emissions. • Increase predictability. These designs have considered the forecast growth and all international recommended practices and obligations to ensure that the minimum amount of CAS required to provide a safe and efficient airspace design is used. This design process has included a review of the extant CAS bases and Airspace Classification. Where possible CAS bases have been raised releasing CAS and access to CAS has been increased by downgrading the existing classifications where it is safe to do so. Throughout the design process, airspace users impacted by the proposed design have been engaged with to ensure a thorough understanding of any impact on both sides, and palatable compromises were made to the design as needed. The impacted airports have been engaged throughout the design process to ensure that sufficient capacity has been incorporated into the network designs to accommodate the airports aspirations to develop their operations in line with their business plans.

AMS criteria	How this ACP aligns with the AMS
Environmental sustainability: This will be an overarching principle applied through all airspace modernisation activities. Modernisation should deliver the Government's key environmental objectives with respect to air navigation as set out in the Government's Air Navigation Guidance (Reference 13) and, in doing so, will take account of the interests of all stakeholders affected by the use of airspace.	This ACP will accommodate changes made to the lower level (below 7,000 ft) airspace by the corresponding airport led ACPs. Minimising the noise impact of these changes is a priority for these ACPs and will be considered in all options proposed. This ACP seeks to introduce a new arrival and departure route over the sea which will enable a reduction in land overflight, reducing the cumulative noise impact to ground-based stakeholders. However, this ACP proposes changes to the en-route network which will only affect flights at and above 7,000 ft. As such, in accordance with the DfT altitude-based priorities, noise impacts are not prioritised. Introduction of a systemised route structure will lead to an improved environmental footprint of the airspace by: • Improving the efficiency of the airspace. • Reducing conflictions requiring ATC intervention. • Improving CCO and CDO operations. • Reducing Fuel burn and CO_2 emissions per flight. The proposed designs are consistent with the objectives in ANG2017 (Reference 13). The proposed airspace structures strike an appropriate balance in accordance with the environmental objectives as set out in the ANG2017 (Reference 13).

Table 1: How this ACP aligns with the AMS objectives.

2.12.6 NERL, Edinburgh Airport and Glasgow Airport, are all working on separate, but coordinated, airspace change proposals to meet these AMS objectives via FASI-N airspace change proposals. Each airport's FASI-N proposal interacts with, and has some reliance upon, the FASI-N proposals of other airports as well as the NERL FASI-N ACPs related to changes to the UK's ATS route network.

2.12.7 The fundamental redesign of an ATS route network is a large programme. It involves redesigning the routes serving many airports at all altitudes in a coordinated way, using precise and flexible satellite navigation. This is expected to bring efficiencies to the ATS route network by enabling more continuous climbs and descents, while systemising the routes to keep them separated from those of neighbouring airports (see section 6.3).

2.12.8 The changes proposed in this consultation will interface principally with the following airports with connectivity to the ATS route network contained within the ScTMA:

- Edinburgh Airport
- Glasgow Airport
- Glasgow Prestwick Airport [6].

2.12.9 The changes described herein, combined with those of Edinburgh Airport and Glasgow Airport deliver the objectives of the Masterplan Iteration 3- Scotland and are aligned with its key indicators.

[6] Glasgow Prestwick introduced PBN procedures 2019 and are not pursuing any further changes. Connectivity will be maintained to these existing procedures.

2.12.10 Aircraft transiting to/from the other airports are also likely to benefit from the proposed network improvements.

2.13 Airport ACP Alignment

2.13.1 Within the lateral limits of this change, Edinburgh Airport and Glasgow Airport are pursuing their own ACPs. Connectivity between the other airports and the ATS route network will be maintained.

2.13.2 These ACPs seek to alter the lower level (procedures contained either partially or fully in airspace below 7,000 ft) routes such as Standard Instrument Departures (SIDs) and arrival transitions between the holds and the runways. These procedures will need to connect to the NERL changes.

2.13.3 However, the changes within the NERL ACP (this ACP) will be vertically separated from most changes proposed by the airports. However, some procedures will transition between the higher en-route airspace (at and above 7,000 ft) and the lower airspace (below 7,000 ft). For example, SIDs climbing to a Flight Level (SID2FL).

2.13.4 In the case of SID2FL, the airport led ACPs will include the procedures that transition between the higher, above 7,000 ft, en-route airspace and the lower, below 7,000 ft, airspace (SIDs) within their submissions. However, the description of the procedure track above 7,000 ft will be included within this consultation document.

2.13.5 The airports will provide the required analysis and flight validation for the full procedure. These procedures have been designed in collaboration with NERL and are compatible with the NERL design but remain the responsibility of the airport authority.

2.13.6 The airports have provided NERL with SID end points, lateral tracks and planned levels so that the NERL options can align and integrate with these airport options. These SID end points are common to all the airport owned departure procedure options to ensure the NERL design is compatible with all departure options proposed by the airports. An expected 7,000 ft point has been identified for each procedure to enable NERL to describe the portion of the procedure that targets an aviation audience only.

2.13.7 The hold locations have been identified through NERL led development simulations and collaborative workshops between NERL and the impacted airports. These hold locations provide a common starting point for all the arrival transitions proposed by the airports ensuring they are compatible with the options proposed by individual sponsors with minimal impact on other airspace users. The proposed hold locations, including their nominal tracks, are required to be situated within 40 NM of the airfields, the operational limit of the airports radar coverage, to ensure ATC have a complete understanding of the airspace picture.

2.13.8 Whilst it is acknowledged the changes described within this ACP may impact tracks below 7,000 ft, the route changes contained within this submission are in airspace at and above 7,000 ft. The track changes below 7,000 ft within the system wide change are limited to parts of the departure procedures (SIDs) and arrivals following the holds (Arrival Transitions). These procedures are captured within the airport led ACPs. As such, in-line with the Air Navigation Guidance 2017 (Reference 13) there is no requirement for the NERL changes to be included in any cumulative noise impacts.

2.13.9 The system wide airspace has been achieved through collaborative design workshops and simulations to ensure that each ACP is fully compatible with the remaining surrounding operation as well as the new options proposed by each sponsor.

2.13.10 As such, the NERL options have been assessed to be fully compatible with the changes proposed to the lower airspace by the relevant airports.

2.14 Airport Cumulative Analysis Framework

2.14.1 Multi-sponsor changes such as those covered within the FASI program are complex. The options proposed by one sponsor may conflict with those proposed by another and *vice versa*. To resolve these conflictions and develop the most beneficial design required collaboration and compromise following a clear understanding of the impact of the individual and combined options.

2.14.2 NERL are cognisant that any changes proposed within this documentation may impact the options proposed by the low-level airspace sponsors (Edinburgh Airport and Glasgow Airport). Likewise, any changes proposed by the airports may impact on the designs that NERL propose and because of this, there exists a high level of interdependency between, and complexity surrounding, the proposed options.

2.14.3 The Airspace Change Organising Group, ACOG, was set up to coordinate the national change programme to which FASI contributes. One aspect of ACOG's role was to develop a recommended method of considering how these multi-sponsor impacts can be measured, and to facilitate structured discussions between sponsors to lead to the resolution of any conflicting designs.

2.14.4 The Options proposed by the airports are primarily in the airspace below 7,000 ft. In accordance with the requirements set out in CAP1616 and the ANG 2017 (Reference 13), the analysis requirements for these options are more involved than for changes at and above 7,000 ft. Therefore, this cumulative assessment is of greater importance for the low-level options. These proposed procedures may want to use the same airspace and may affect a wider range of stakeholders, in particular changes in how often and how high communities may be overflown, where aircraft noise would be an impact.

2.14.5 In Stage 3 of the CAP1616 process, the ACP sponsors collaborated with ACOG to refine and integrate the shortlisted options into an overall Scottish Airspace Modernisation proposal. This involved assessing the options when viewed as a collective. For more information about the overall Scottish Airspace Modernisation proposal please see the ACOG Annex here.

2.14.6 A key goal of the Masterplan is to outline how the options in each ACP relate to one another (their interdependencies), including any design conflicts and the potential solutions. Interdependencies occur when the options from different ACPs are linked, for example when one sponsor's designs affect the feasibility of another's. A design conflict arises if these options cannot coexist as they are. In such cases, ACP sponsors must work together to modify or remove options to resolve the conflicts. Resolving conflicts often involves trade-offs, where different solutions lead to varying combinations of positive and negative impacts. These trade-offs reflect the compromises made to prioritise benefits in one area, sometimes at the expense of improvements in another, while always maintaining safety as the top priority. For more information about the treatment of ACP interdependencies and design conflicts please see sections B3, B4 and B5 of the Masterplan Iteration 3 here.

2.14.7 ACOG has developed a Cumulative Analysis Framework (CAF) described in Appendix 1 of the Masterplan here, to guide ACP sponsors in identifying interdependencies and resolving design conflicts through evidence-based trade-offs.

2.14.8 Edinburgh Airport, Glasgow Airport and NERL collaboratively reviewed the ACPs using the CAF methodology, identifying 18 potential interdependencies. Eight of these arose from interactions between arrival and departure route options in the Glasgow and Edinburgh Airport ACPs. Further analysis confirmed that these interdependencies would not result in design conflicts, so no modifications to the designs were necessary.

2.14.9 The remaining ten interdependencies involved options for the position of the airborne holds included in the NERL ACP and their potential to interact with the route options included in the airport ACPs. Further analysis identified that two of these interdependencies may result in design conflicts between the Glasgow Airport ACP and the NERL ACP.

2.14.10 The first design conflict involved an option to locate a new hold to the west of Glasgow. This was resolved following a qualitative review of the potential solutions and trade-offs that

demonstrated one solution – to discontinue the option for a new hold to the west of Glasgow – was clearly preferable.

2.14.11 The second design conflict involved options to replace the existing airborne holds to the north of Glasgow. Again, this was resolved following a qualitative review of the potential solutions and trade-offs that demonstrated one solution was clearly preferable – to propose a new hold in a similar location to the existing one that is realigned to better accommodate traffic inbound to Glasgow from the east.

2.14.12 Appendix 3 of the Masterplan Iteration 3 here provides a full description of all 18 interdependencies and the qualitative assessments of the two design conflicts, including the potential solutions and trade-offs.

2.15 Design Principles

2.15.1 The design principles and priorities were set following engagement with representative stakeholder groups and feedback received as part of CAP1616 Stage 1 (Reference 4). The design principles and their relative priorities are shown below in Table 2.

2.15.2 These were used to evaluate the design options proposed during Stage 2 to determine which were discarded and which were progressed (Reference 5).

No	Design Principle (Priority)	Category	Notes
1	The airspace will maintain or enhance current levels of Safety (High)	Safety	
2	The proposed airspace will maintain or enhance operational resilience of the ATC network (High)	Operational	
3	The proposed airspace design will yield the greatest capacity benefits from systemisation (High)	Operational	
4	The ScTMA airspace design will provide a compatible and optimised interface between the lower-level terminal airspace; the upper Free Route Airspace (FRA) and the ATS network (High)	Technical	
5	The proposed ScTMA airspace will facilitate optimised network economic performance of the entire route (Medium)	Economical	This includes track mileage/ fuel-burn/ route charges
6	The proposed ScTMA airspace will facilitate the reduction of CO_2 emissions along the entire route (Medium)	Environmental	
7	Minimise environmental impacts to stakeholders on the ground (note: network changes are >7,000 ft, the position of the interface with the airport's lower-level routes will be determined by the airport, hence impacts below 7,000 ft will be addressed in the separate airport sponsored ACP) (Low)	Environmental	
8	The ScTMA airspace should be compatible with the requirements of the MoD (Medium)	Operational	
9	The impacts on GA and other civilian airspace users due to ScTMA should be minimised (Medium)	Operational	This includes a wide variety of other airspace users such as emergency, recreational, training and sporting aviation. Consider where impacts might be greatest by considering known VFR significant areas and Military-use areas against placement of airspace structures
10	The classification and volume [7] of controlled airspace required for the ScTMA should be the minimum necessary to deliver an efficient airspace design, taking into account the needs of UK airspace users (Medium)	Technical	This may include releasing CAS as appropriate

[7] When assessing volume of CAS, a major increase will be defined as an entirely new airspace structure and minor will be defined as an increase to an existing structure to accommodate an option.

No	Design Principle (Priority)	Category	Notes
11	The route network linking Airport procedures with the enroute phase of flight will be spaced to yield maximum safety and efficiency benefits by using an appropriate standard of PBN. (High)	Technical	Where appropriate, the use of RNP should be considered if the fleet mix can support it.
12	Must accord with the CAA's published Airspace Modernisation Strategy (CAP1711) and any current or future plans associated with it. (High)	Policy	The CAA have stated that this DP is required by all change sponsors. CAP1711 describes what airspace modernisation must deliver including: - the need to increase aviation capacity. - growth to be sustainable. - the need to maximise the utilisation of existing runway capacity.
13	The airspace should introduce improved Continuous Climb Operations (CCO) and Continuous Descent Operations (CDO) for all aircraft (Medium)	Environmental	Feedback from Airlines

Table 2: Design Principles

2.16 This Consultation Document

2.16.1 This document is our main consultation document which provides details of the background to this ACP and the proposed changes. It aims to explain the proposed changes and summarise the impact of these changes.

2.16.2 This Consultation Document is broken down into 9 main sections and 3 appendices.

- Executive Summary: This section provides a brief summary of the proposed change and the impacts associated with it
- Introduction: This section describes the background to the change
- Key Technical Details: This section provides a summary explanation to technical terminology used within this document set
- About this Consultation: This section summarises the engagement activities following Stage 2 as well as the planned consultation activities
- Current Airspace: This section provides a description of the current airspace and how it is used in today's operation
- Proposed Changes: This section provides a description of the proposed changes
- Impact of this Proposal: This section provides a high-level summary of the Full Options Appraisal, so that consultees can understand the potential positive benefits and negative impacts of the proposed option
- Reversion Statement: A Statement on what will happen if the proposed change is implemented but needs to revert to the previous state
- Consultation Participation: A summary of how stakeholders can respond and what happens with their responses
- Appendix A: Glossary: A summary of the terminology and acronyms used within this document
- Appendix B: Summary of Stakeholder Engagement: A summary of the engagement activities between Stage 2 and Stage 3 and the impact this has had on the design
- Appendix C: Consultation Questionnaire: A list of the questions that will be asked to consultees via the Citizen Space Website.

3. Key Technical Details

3.1 Altimetry – Altitudes, Heights and Flight Levels

3.1.1 Aircraft can use different vertical references when flying. "Altitude" specifically means the distance of an aircraft above mean sea level using a converted local or regional pressure setting; "height" specifically means the distance above the surface/terrain using a local pressure setting; "Flight Level" (FL) is a standard reference for aircraft at higher levels, in hundreds of feet, so an aircraft at FL90 is 90 x 100 = 9,000 ft above the standard reference.

3.1.2 Controllers need to use reference settings which are common for the aircraft under their control and those adjacent, hence the use of altitudes and flight levels.

3.1.3 All of the changes proposed within this ACP only apply to aircraft flight paths at or above an altitude of 7,000 ft which is above the transition altitude (TA) [8] for all airports. Above the TA, aircraft fly with reference to Flight Levels (FLs), hence in this document we generally refer to Flight Levels e.g. FL70 = 7,000 ft.

3.2 Distances and Speeds

3.2.1 In aviation, lateral distances are often measured using nautical miles (NM). 1 NM is equivalent to 1.852 km, 1.15 miles or 6076 ft. Speeds are measured using nautical miles per hour or knots (kts).

3.3 What do we mean by systemisation?

3.3.1 Systemisation refers to the process of reducing the need for human intervention in the air traffic control system. For example, this can be achieved by utilising improved navigation capabilities to develop a network of routes that are safely laterally and/or vertically' separated by approved minima/distances from one another. In these circumstances aircraft are guaranteed to be kept apart reducing the need for air traffic control to intervene so often, or by providing alternate routings which may reduce or simplify aircraft conflictions. Systemisation can reduce complexity whilst benefiting safety and capacity. A systemised route network can be characterised by the following:

- An air route network where climbing and descending aircraft follow a structured route system based on their departure point and/or destination
- Route design is predicated on the use of Performance Based Navigation (PBN) which enables very accurate track conformance to precisely defined routes. This allows the distance between routes to be safely minimised based on CAP1385 requirements
- Systemising ATS routes should reduce the amount of tactical intervention required, by optimising the routings available within a given piece of airspace
- The allocation of traffic on routes is driven by traffic data, both historical and future, and the input from sector controllers amongst other operational and environmental factors
- Although systemisation is expected to reduce the amount of controller intervention required, there will still be instances where controllers will need to use tactical intervention (e.g. controllers' direct aircraft by assigning specific headings to fly) for expedition, to resolve conflictions, and avoid weather.

3.3.2 It is recognised that the introduction of systemised airspace may introduce additional planned track milage for some routes. However, any disbenefit from this may be offset by a more efficient design.

[8] The altitude at which aircraft change to using FL as the altimetry reference for maintaining vertical separation (i.e. change from the local airport pressure setting to standard pressure: 1013 hPa). This is 6000 ft for most UK airports though some have lower TAs (see AIP ENR 1.7 - 4.1).

3.4 Systemisation and Separation

3.4.1 The proposed ScTMA airspace will be managed by NATS Prestwick Centre ATC ("Scottish Control"). Flights will be radar monitored by ATC with the assistance of tools where appropriate. These will alert ATC if a flight deviates from its expected trajectory, or if aircraft trajectories are in conflict and hence ATC intervention is required.

3.4.2 The ATS lateral route spacing is based on CAP1385 route separation criteria and assumes a 3 NM minimum lateral radar separation environment.

3.4.3 Route selection will be defined within the Standard Route Document (SRD) or FRA Arrival / Departure profiles which would specify the required route depending on origin and destination.

3.4.4 ATS routes, Instrument Flight Procedures (IFPs) and holds will be contained within CAS as described in Safety and Airspace Regulation Group (SARG) Policy 126: Policy for the Design of Controlled Airspace Structures.

3.5 Considerations and Guidance for Vertical Interactions in Terminal Airspace Design

3.5.1 Aircraft departing an airport under Instrument Flight Rules (IFR) typically follow an Instrument Flight Procedure (IFP) [9] called a SID. SIDs provide departure connectivity between the airport and the ATS route network and describe the lateral and vertical profile of the route.

3.5.2 SIDs typically end at or below the published Transition Altitude (TA) [10], predominantly 6,000 ft within controlled airspace in the UK (ENR 1.7 of the UK AIP) to remove the complexity associated with providing separation between aircraft operating on different pressure settings [11] (i.e. those flying at an altitude and those flying at a FL).

3.5.3 The airports are proposing introducing arrival transitions, which provide connectivity from the hold to airport.

3.5.4 As these procedures affect the tracks and profile of flights below 7,000 ft, they are generally considered to be outside the scope of this ACP and are the responsibility of the relevant airport sponsor. However, airport sponsors are considering introducing SIDs which climb aircraft above 7,000 ft and NERL is considering raising the holding levels for some of the holds serving the ScTMA airports.

Existing Guidance

3.5.5 The CAA previously published interim guidance for SID design considerations for procedures terminating at a Flight Level on 24 January 2014. This was republished in May 2023 (DAP Guidance 108). These documents sought to provide Sponsors with sufficient guidance to inform design elements appropriate for simple interactions in their airspace design.

3.5.6 The progression of sponsor cluster designs within FASI introduced more complex interactions between multiple procedures from different airports.

3.5.7 In these situations, additional considerations and guidance are required to develop holistic airspace designs. Specifically, this is where:

- multiple interacting procedures exist either side of the transition layer [12]
- there are SIDs that climb to a Flight Level and/or
- vertically coded STARs or Approach Transitions that descend from a Flight Level to an altitude.

[9] An IFP is a procedure is a published procure which details the lateral and, in some instances, the vertical profile of an aircraft in the vicinity of an aerodrome. IFP's are designed to achieve and maintain an acceptable level of safety in operations.
[10] The transition altitude is the level where the vertical position of an aircraft switches from an altitude, determined by an airfield QNH (pressure setting) to a flight level, determined by a common pressure setting of 1013 mbar.
[11] For further information regarding pressure settings see the following article: https://www.skybrary.aero/articles/altimeter-setting-procedures
[12] The Transition Layer is the layer of airspace between the defined Transition Altitude and the Transition Level (the lowest usable Flight Level above the TA)

3.5.8 The additional considerations and guidance must be robust to any possible variations in the flight crew application of pressure setting changes, and potential delays or errors in those changes, in order to minimise the risk of a loss of separation on interacting routes.

Purpose of CAGVI

3.5.9 The CAA's previous Policy Statement references a need for additional mitigations when more complex vertically coded procedures were desired, and the purpose of the Considerations and Guidance for Vertical Interactions in TMA Airspace Design (CAGVI) document expands on and provides these mitigations. CAGVI does not attempt to provide a definitive solution for all designs, however the guidance contained within this document provides a design concept framework from which Sponsors can develop more complex network scenarios that cater for overlapping 3 dimensional procedures that bridge the transition layer.

3.5.10 The separations detailed, along with the scenarios illustrated, provide guidance for the lateral and vertical constraints Sponsors should implement that offer resilience to cockpit delays or inaccuracies of pressure datum setting, from which their designs may evolve.

3.5.11 Within this design, SID end points align vertically and laterally with the route network (to provide direct connectivity with the ATS network).

3.5.12 The proposed designs will allow aircraft to climb to a higher initial level on take-off than they do today before controllers would need to interact with them. This limits the requirement to level off and improves Continuous Climb Operations (CCO). This will provide fuel, CO_2e and noise benefits as well as reducing pilot workload, thereby improving safety.

3.5.13 Whilst any SID or arrival transition procedure proposed within an airports ACP may appear to contain an element within the scope of this ACP, the design and consideration of these procedures remain the responsibility of the airport sponsor below 7,000 ft. Above this level, CAF analysis has been used to identify any conflictions between the network (this ACP) and the airports IFPs to ensure the best-balanced combinations are achieved. See CAF2 here. Airport IFPs are fully described within the corresponding airports documentation although it is considered prudent to include the portion of the IFP above 7,000 ft within this document set.

3.6 Introduction, Release and Re-classification of Controlled Airspace

3.6.1 UK ATS routes and IFPs are required to be contained within CAS. In the UK, there are 5 classes of airspace, ranging from the most restrictive (Class A) to the least restrictive (Class G). There is no Class B or F airspace within UK Flight Information Region (FIR).

3.6.2 Within UK airspace, all airspace between FL195 and FL660 is Class C. Above FL 660 is Class G.

3.6.3 Each classification of airspace has different entry requirements for Instrument Flight Rules (IFR) [13] and Visual Flight Rules (VFR) [14] traffic as well as separation requirements between aircraft. Those requirements are shown in Figure 6.

[13] Instrument Flight Rules (IFR) are rules which allow properly equipped aircraft to be flown under instrument meteorological conditions (IMC).
[14] Visual Flight Rules (VFR) are the rules that govern the operation of aircraft in Visual Meteorological Conditions (VMC) (conditions in which flight solely by visual reference is possible).

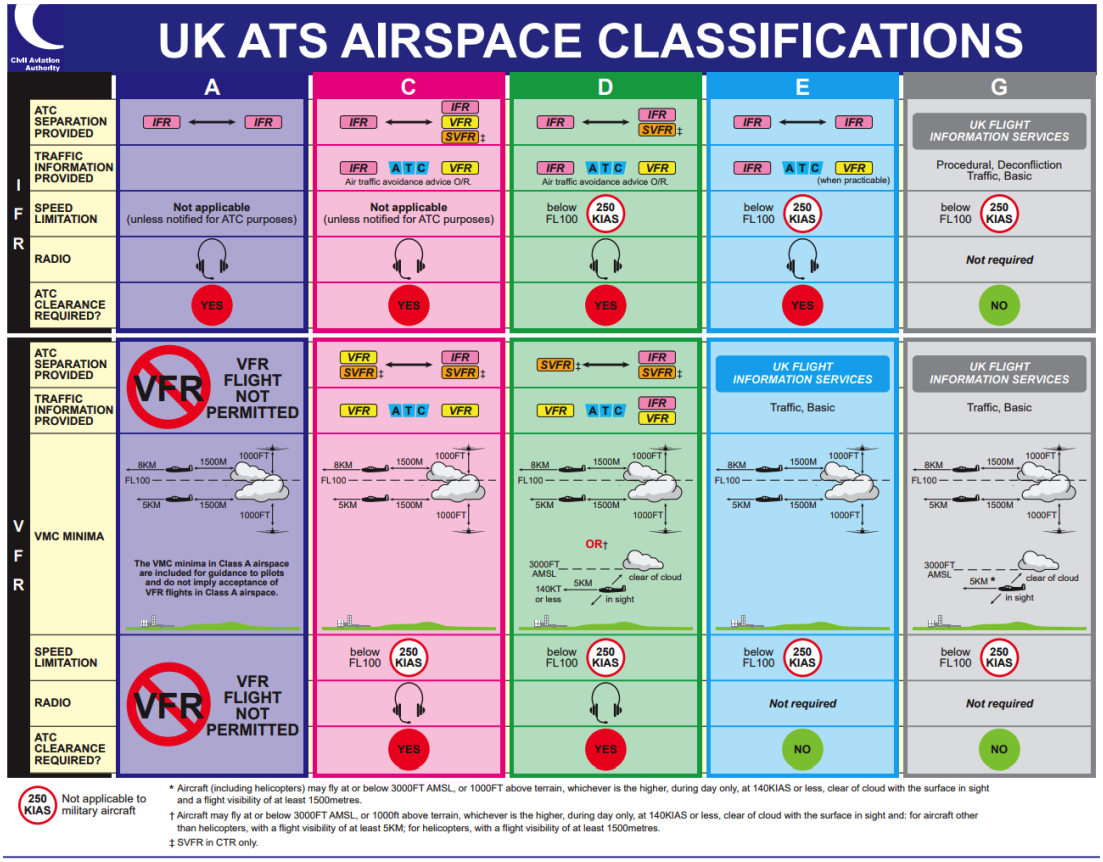


Figure 6: UK Airspace classifications and their entry requirements.

3.6.4 The options presented in this document require some changes to the volumes and or classification of CAS.

3.6.5 A comprehensive review of existing CAS has been undertaken as part of this ACP and is included in Section 6.2.

3.6.6 Where possible CAS that is no longer required is proposed to be released (re-classifying as Class G airspace) and any remaining CAS will use the lowest appropriate airspace classification commensurate with traffic loading. This will improve access for all users whilst delivering a safe and efficient airspace design. This release and re-classification of CAS could serve to off-set in part, any new CAS required resulting from the airspace design proposed herein.

3.6.7 The lowest level of aircraft flight path affected by this ACP is FL70. However, there are some instances where changes to CAS below FL70 are being proposed. E.g. where the base of CAS could be raised, it is possible that a base below 7,000 ft (e.g. 5,500 ft or FL65) could be raised to say FL75, thereby releasing CAS (converting it to uncontrolled Class G airspace); a lowering of bases to encapsulate the current operation within CAS where it has not previously been contained; or where an airport procedure below FL70 needs to be encapsulated within the network airspace (In this instance, the airports will provide the required environmental analysis for their procedures). For details of the changes to controlled airspace proposed please see Section 6.2.

3.6.8 The amount of new CAS required below FL195, can be minimised by designating routes using the appropriate standard of PBN (e.g. RNAV 1). (If routes are defined using PBN, the aircraft can fly them with greater accuracy, this permits routes to be positioned closer to each other as well as to the edge of CAS, thus requiring less CAS).

3.7 PBN Equipage and Route Navigation Specification

3.7.1 States are required to designate a navigational performance specification for ATS routes [15].

3.7.2 Most aircraft within the UK are Area Navigation (RNAV) 1 equipped (or better) [16]. Table 3 below shows the PBN equipage for FASI-N airports and the overall UK airport equipage (data from flight plan data for all flights during 2022 and 2023). It should be noted that as this data is taken from filed flight plan data, aircraft only need to confirm their equipage meets the requirements for their planned route and not their actual equipage. Therefore, the RNAV 1 equipage rate may be higher than that shown here.

ICAO Origin	Airport	2022 Filed PBN Equipage >=RNAV 1	2023 Filed PBN Equipage >=RNAV 1
EGPH	Edinburgh	99.2%	99.9% ↑
EGPF	Glasgow	99.3%	99.8% ↑
EGPK	Glasgow Prestwick	94.7%	98.3% ↑
EGPD [17]	Aberdeen	88.4%	89.7% ↑
EGGP	Liverpool	97.7%	99.0% ↑
EGCC	Manchester	98.8%	99.9% ↑
EGNM	Leeds Bradford	97.8%	99.9% ↑
EGNX	East Midlands	98.8%	99.6% ↑
EGBB	Birmingham	98.3%	99.5% ↑

Table 3: Filed PBN Equipage for FASI-N Airports. Data is provided for 2022 and 2023.

3.7.3 Due to the high equipage rates declared and the expectation that this will increase as older airframes retire, the ScTMA airspace and routes will be designated as RNAV 1. RNAV 5 traffic will be accommodated where required through flight plannable Directs and vectoring. However, due to the low incidence of these aircraft, these routes will not be direct nor via optimised routings as this would penalise the majority of aircraft using the airspace.

3.8 ATS Routes - CAAs Controlled Airspace Containment Policy

3.8.1 The documentation submitted for Stage 2 referenced the CAA's Controlled Airspace Containment Policy. This policy was withdrawn on 11th August 2022 and replaced with the CAA's Policy for the Design of Controlled Airspace Structures (Reference 12). This policy provides guidance on the minimum distance that ATS route or IFP can be positioned from the edge of CAS. For example, an RNAV 1 specified route below FL195 this distance is 2 NM for straight legs and fixed radius turns or 3 NM for "non straight legs". Within UK airspace, all airspace between FL195 and FL660 is Class C and therefore this criterion does not apply between these levels.

3.9 Policy for the Establishment and Operation of Special Use Airspace

3.9.1 The Policy for the Establishment and Operation of Special Use Airspace (SUA) (Reference 14) replaced the SUA Safety Buffer Policy in February 2024. This policy states the closest distance that aircraft can flight plan around areas of SUA (such as military Danger Areas). This also determines the minimum distance that routes can be positioned in proximity to SUA.

[15] The legislative requirements for navigation specification of the UK ATS network are available on the CAA Website here.
[16] RNAV 1 equipage means that an aircraft will pass within 1NM of the fix 95% of the time. Other RNAV standards also apply, with the number presenting how many NM it could be from the fix (ie. 1, 5, 10 NM).
[17] Due to no interactions with adjacent ACPs, Aberdeen airport withdrew from the FASI program on 15 September 2023. They are included here for information only.

3.9.2 The proposed design option is fully compatible with this policy.

3.10 Consequential Planned and Permanent Redistribution of Air Traffic (PPR) Impacts on non-FASI Airports

3.10.1 The changes described herein have the potential to alter the lateral tracks of aircraft arriving at non-FASI aerodromes and/or the distribution of aircraft between SIDs departing these aerodromes, Type 1 and Type 2 PPRs.

3.10.2 In the case of a potential lateral change in arrival tracks, this will either be captured within the corresponding airports ACP or ATC will be required to vector aircraft in a manner analogous to today's operation, ensuring the approach tracks are within acceptable tolerances as described within CAP1617: Planned and Permanent Redistribution of Air Traffic (Reference 16).

3.10.3 Any redistribution of aircraft between SIDs will be included within the relevant airports ACP.

3.10. Other Design Concepts Considered (but Not Progressed)

3.10.4 Full assessment of design options which were considered but not progressed is given in Reference 5 (Design Principle Evaluation and Options Appraisal).

3.11 Full Options Appraisal

3.11.1 The "Full Options Appraisal including safety assessment" (Reference 8) as required by CAP1616 (Reference 9), accompanies this document and is published on the CAA portal for this airspace change.

3.12 Implementation Timetable

3.12.1 The earliest implementation of any of the changes proposed herein would be Q1 2027. Implementation is subject to CAA approval.[18]

[18] The expected year for implementing the proposed changes (currently 2027) could shift. This depends on the UK Government's priorities for airspace modernisation and the capacity of the aviation industry to manage the introduction of major changes safely and efficiently.

4. About this Consultation

4.1 Overview

4.1.1 This consultation allows NERL to gather or confirm views from stakeholders, and information, about the potential impact of this Airspace Change Proposal. Stakeholders can comment on the strengths and weaknesses of this proposal and how it could be improved.

4.1.2 This consultation is running concurrently with the following ACP consultations relating to the lower-level (below 7,000 ft) airspace:

- ACP-2019-46: Glasgow Airport Airspace Change
- ACP-2019-32: Edinburgh Airport Airspace Change Programme (FASI).

4.1.3 Although the design work has been completed collaboratively, the three ACPs remain independent. Edinburgh Airport and Glasgow Airport and are both stakeholders in this change.

4.1.4 Stakeholders are given the opportunity to provide relevant feedback, which may conflict with that of other stakeholders. NATS will design the airspace in line with current CAA policies unless there is a clear, justified remit across affected stakeholders to do differently, or if the needs of other Air Navigation Service Providers (ANSPs) take primacy, in order to progress the proposal.

4.1.5 Stakeholders therefore have a crucial role in providing relevant and timely feedback to the Change Sponsor (NERL) in the form of their views and opinions on the impact of a particular Airspace Change Proposal.

4.2 Pre-Engagement Activities

4.2.1 The development of the ScTMA system wide design is a collaborative exercise between Edinburgh airport, Glasgow airport and NERL. The airports are responsible for the changes relating to arrival transitions (routes taken from the holds to the airport) and SIDs (departure routes connecting the airports to the route network). NERL is responsible for the ATS route network, STARs (routes connecting the ATS network to the associated holds. Due to the complexity, the required alignment and interdependency between these ACPs, regular engagement has been required to develop the system wide design.

4.2.2 Due to the complexity of the design, as well as the desire to benefit all stakeholders, it has been necessary to regularly engage with airspace users for whom the design may impact. This has principally been Edinburgh Airport and Glasgow Airport, as well as the military and BGA due to additional airspace requirements in regions utilised by these users.

4.2.3 The proposed NERL design option is compatible with all options being consulted on by the Scottish Airspace Modernisation airports.

4.2.4 All of the above stakeholders and engagement activities have been summarised in Appendix B: Summary of Stakeholder Engagement.

4.3 Who are we Consulting?

4.3.1 This Consultation aims to reach all stakeholders who may be impacted by the proposed changes. This is primarily aviation industry stakeholders, such as Airlines and General Aviation. However, NERL will welcome a response from any stakeholder that considers this change may have an impact, positive or negative, on them.

4.3.2 As the proposed changes in the NERL ACP are above 7,000 ft, NERL will not be targeting non-aviation stakeholders. However, where appropriate NERL will support the Scottish Airspace Modernisation airports in their consultation activities by attending airport community engagement sessions and by responding to questions raised in these events that may impact the proposed NERL airspace design.

4.3.3 Our consultation strategy includes more information about how we have identified our consultation audience, who are consultation audience are, and our approach to tailoring the consultation to different stakeholders.

4.4 Scottish Airspace Modernisation Website

4.4.1 Stakeholders will be directed to the Scottish Airspace Modernisation website in the first instance:

www.scottishairspacemodernisation.co.uk

4.4.2 From there, they will find links to the sponsors individual Citizen Space pages where responses can be made.

4.5 Our Citizen Space Page

4.5.1 The NERL consultation will be hosted on the following Citizen Space Page:

https://consultations.airspacechange.co.uk/nats/sctma

4.5.2 This website contains links to our consultation materials, supporting documents a list of webinars and joining instructions.

4.5.3 Stakeholders will be able to respond to the NERL consultation via this website.

4.5.4 Links direct to the Edinburgh Airport and Glasgow Airport Citizen Space pages will be provided on the NERL Citizen Space Page.

4.6 Consultation materials

4.6.1 A suite of consultation materials, presenting information at various technical levels has been created to aid stakeholders in understanding the context of this consultation and the scale of the proposed changes.

4.6.2 The materials are listed below, and you can also find links on our Citizen Space website.

- Consultation Document-
  - Annex A: Edinburgh Airport Interface- A description of the Edinburgh airport procedures above 7,000 ft
  - Annex B: Glasgow Airport Interface- A description of the Glasgow airport procedures above 7,000 ft
  - Annex C: Glasgow Prestwick Airport Interface- A description of the Glasgow Prestwick airport procedures above 7,000 ft
  - Annex D: Current Airspace- A description of the traffic flows and ATS routes within the current ScTMA airspace
  - Annex E: Option Development-A summary of how the NERL option has evolved from the Stage 2 concepts.
- Summary Consultation Document- A short, easy to read summary of the consultation document
- Consultation Strategy- A document which describes how we plan to consult on the proposed change
- Full Options Appraisal- A document which describes in full technical detail the options and the positive benefits and negative impacts of the proposal compared against the 'without airspace change' pre-implementation baseline
- Frequently Asked Questions (FAQ) document- A FAQ document which will be updated as the consultation progresses, with any frequent questions that may arise either during the consultation events, or in consultation responses
- ACOG System Wide Description.

4.7 Consultation events

4.7.1 If you are looking to find out more information about our Consultation, we will be holding several webinars where the NERL Airspace Change team will be available to answer any questions you may have about our proposals.

Webinars

4.7.2 A number of bespoke webinars have been scheduled to take place at the start of the consultation for aviation industry stakeholders, such as Airlines, Airports, General Aviation and the Military. These webinars are part of the co-ordinated consultation with Edinburgh Airport and Glasgow Airport. A bespoke webinar will be offered to MPs/MSPs.

4.7.3 NERL has scheduled 2 webinars which will be open to all consultees. The aim of the webinars is to provide consultees an avenue to engage directly with the NERL Airspace Change team and ask questions regarding the proposals.

Further questions

4.7.4 If you have any further questions, please contact us by email, airspaceconsultation@nats.co.uk. Please note that all responses to the consultation should be submitted via the Citizen Space Portal (see below for more information).

4.8 How to respond to the Consultation

4.8.1 The consultation runs for 14 weeks from 00:01 hrs on Monday 20 October 2025 to 23:59 hrs on Sunday 25 January 2026.

4.8.2 All responses to the consultation should be submitted online via the CAA's Citizen Space Portal. This is available at:

https://consultations.airspacechange.co.uk/nats/sctma

4.8.3 All responses to the Consultation will be published on the CAA's Citizen Space Portal. If you wish for your response to be published anonymously, there is an option to redact your personal details, and these will only be seen by NERL, Edinburgh Airport, Glasgow Airport and the CAA.

4.9 Analysis of your feedback

4.9.1 The Consultation closes on Sunday 25 January 2026 (23:59hrs). NERL will then collate, review and categorise the consultation responses. Responses will be categorised into those which present information that may lead to a change in design and those that would not.

4.9.2 We will then produce a Consultation Response document that will summarise the consultation, the responses we received, and our response.

4.10 To stay Informed

4.10.1 If you wish to register for updates on the NERL ScTMA ACP you can do so on the ACP portal at the following link:

https://airspacechange.caa.co.uk/PublicProposalArea?pID=192

5. Current Airspace

5.1 Overview of Current Airspace

5.1.1 NERL is the ANSP responsible for the service provision within UK en-route airspace, typically above FL70, within the Scottish FIR (up to FL245) and Upper Information Region (UIR, above FL245) (see Figure 7).

5.1.2 The airspace overhead the UK land area is split into two regions. The northern region, typically north of 55°N is known as the Scottish FIR with an Air Traffic Control Service (ATCS) provided at the Prestwick Area Control Centre (ACC). The southern region, known as London FIR, includes ATCS provided by the Swanwick ACC [19] & [20]

5.1.3 Airspace can either be controlled (Class A, C, D or E) or uncontrolled (Class G). ATS routes and new IFPs are required to be contained within CAS.

5.1.4 The airspace impacted by this change is situated within both the Scottish and London FIRs and is situated overhead central and southern Scotland as well as part of Northern England. This airspace is provided with an ATCS by the Prestwick ACC.

5.1.5 The changes included will modernise the ATS route network and arrival routes from the en-route airspace (at and above 7,000 ft) to the terminal airspace (below 7,000 ft). This modernisation will affect flights arriving and departing the ScTMA airfields as well as those transiting this airspace.

5.1.6 The routes and procedures within scope of this ACP, contained within the lateral and vertical limits of this change are all contained within Control Areas (CTAs). CTAs which are situated in the vicinity of airfields and formed at the confluence of multiple CTAs are known as Terminal Control Areas (TMAs, formally Terminal Manoeuvring Areas). TMAs contain complex airspace where aircraft arriving/departing airfields and aircraft transiting the airspace all require deconflicting (see Table 4 and Figure 8). Within the limits of this change there are also SUAs that acts as constraints on the design (see Section 5.7).

[19] Further information on how the UK airspace is managed is available at https://www.nats.aero/ae-home/introduction-to-airspace/.
[20] The centres Areas of Responsibility (AoR) does not align with the FIR boundaries. For example, Prestwick Area Control Centre's AoR extends south of the FIR boundary and includes areas as far south as Birmingham

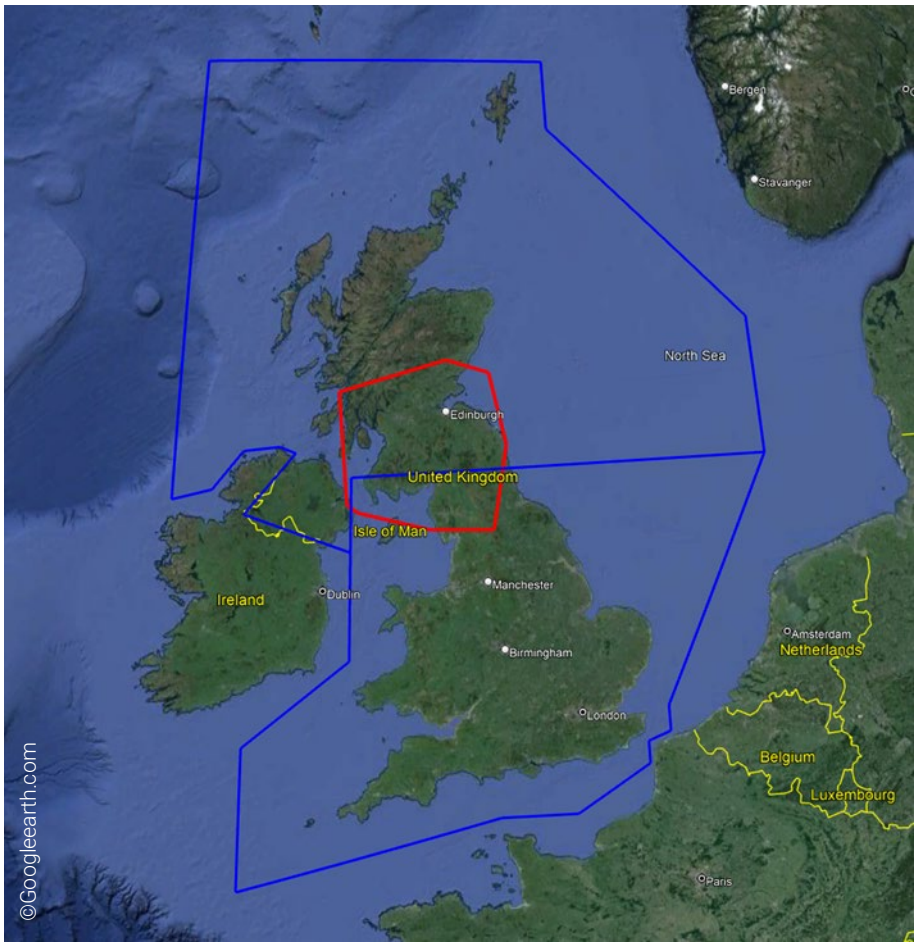


Figure 7: UK airspace showing the Scottish and London FIRs (blue lines) and the airspace impacted by this change (red lines).

5.1.7 The ScTMA is connected to the wider ATS network via eight distinct traffic flows contained within CTAs (Figure 8). Table 4 provides a description of the traffic utilizing these flows. For a detailed description of the CAS structures and routes associated with these traffic flows see Annex D: Current Airspace.

5.1.8 These ATS routes and associated CAS will be reviewed and modernised as required as part of this ACP. These routes are predicated on historic ground-based navigation aids (such as VHF Omni-directional Range [VOR] or Non-Directional Beacons [NDBs]) and do not currently offer optimised routings in and out of the ScTMA. Upgrading the ScTMA airspace will remove the dependency on these legacy ground-based navigation aids.

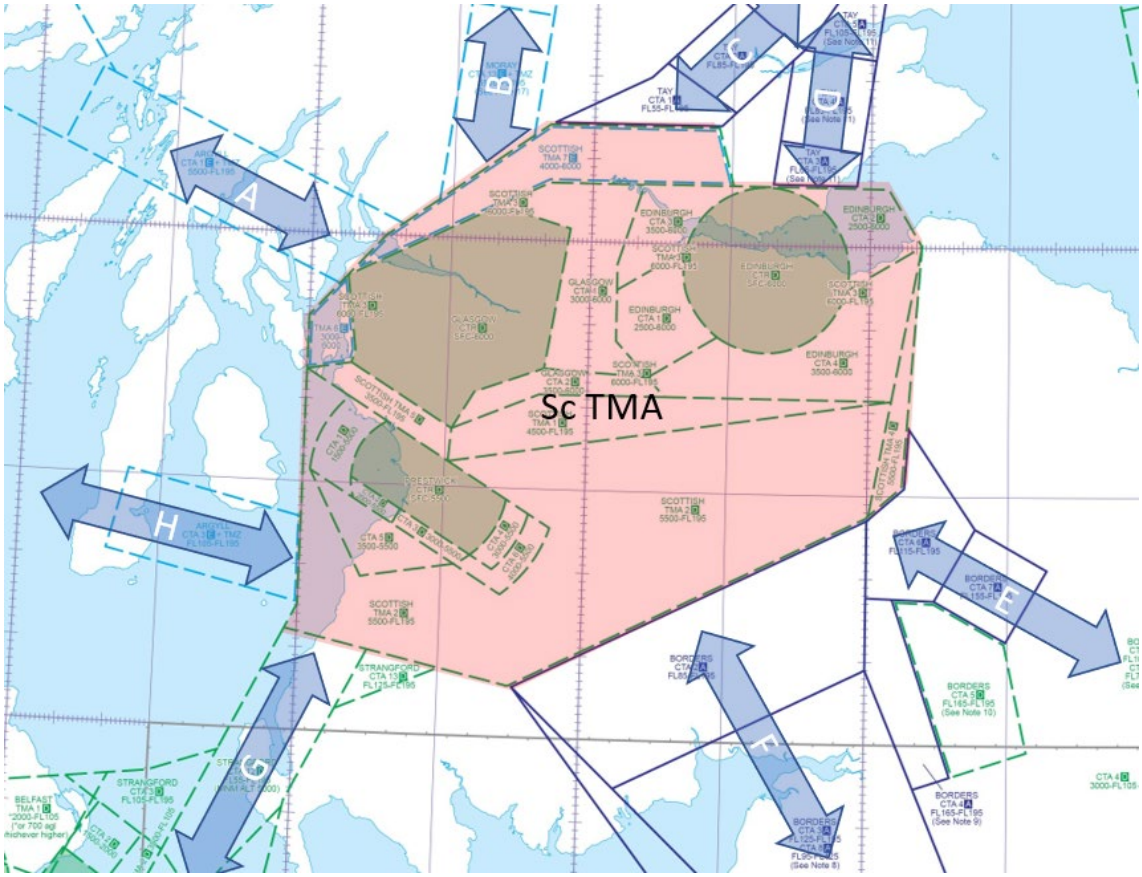


Figure 8: Adapted Airspace map (chart Of United Kingdom ATS Airspace Classifications - SFC-FL195 (ENR 6-7)) showing the traffic flows (blue arrows) which converge on the ScTMA (red shape) and the CTAs which contain them.

Traffic Flow	Description of Traffic
A	This route is mainly used by traffic to and from the Outer Hebrides. This traffic is mainly lower level (<FL195) and most leave CAS to be worked by West coast sector. Occasionally this route is used for traffic to join the NATs.
B	This route is mainly used by Glasgow Traffic (via LOMON) to Wick, Sumburgh, Inverness, the Orkneys and occasionally Reykjavik. This traffic is mainly lower level (<FL195). On occasion this route is used by aircraft joining the northerly NATs (>58N).
C	This route is used by Edinburgh and Glasgow traffic to Perth, Aberdeen, the Shetlands and Northern Scandinavia.
D	This route is used by Edinburgh and Glasgow traffic to Perth, Aberdeen, the Shetlands and Northern Scandinavia. However, this routes use is dependent on gliding area activity.
E	This is the main route connecting the ScTMA to Northern Europe and the East.
F	This is the main domestic route as well as the route connecting the ScTMA to central Europe.
G	This is the main route connecting the ScTMA to Belfast TMA, Ireland, the Iberian Peninsula, the Canaries and Africa.
H	This route provides connectivity to the NATs.
TMA [21]	Traffic arriving, departing and overflying the ScTMA. This airspace volume also contains STARs and holds for aircraft arriving at the Scottish airfields.

Table 4: Description of the CTAs and ATS routes contained within the lateral limits of the ScTMA NERL ACP with proposed updates.

5.2 Air Traffic Services Route Network

5.2.1 The airspace impacted by this change contains several ATS routes which are shown in Figure 9 below and described in Annex D: Current Airspace. These routes extend up to FL255, above this level is assumed to be Free Route Airspace.

5.2.2 Currently aircraft flight plan to fly along the published ATS route structure based around routings listed in the Standard Route Document (SRD) and FRA Arrival and Departure requirements. Typically, the routes selected are the most direct available but may be impacted by several factors such as weather or SUA activity. Due to the large number of SUA areas surrounding the ScTMA airspace aircraft will frequently flight plan different routes to destinations due to their periodic activity.

5.2.3 The existing lower ATS route structure was originally predicated on the location of ground-based radio navigation beacons such as DVORs. This constraint limits the efficiency of the airspace by not always enabling the most direct routings.

5.2.4 Figure 9 shows that the traffic flows are clearly visible that align with the ATS network. However, in the southern region, particularly down the "Spine" (Flow F in Figure 8), there is a high level of controller intervention and vectoring [22] is required to ensure both safety and efficiency of the current airspace. This provides separation and alignment with the southern sectors and method of operation for northerly tracks being orientated on the East and Southerly on the west of the CTAs in this area.

5.2.5 The ATS routes within the lateral limits of this change are a mixture of six RNAV 1 and 13 RNAV 5 routes. Aircraft capable of flying the RNAV 1 routes are required to remain within 1 NM of the nominal centreline of an RNAV 1 route for 95% of the time. Whereas those on the

[21] Airspace above FL195 is Class C. TMAs will be revised to end at FL195 as the additional levels are redundant.
[22] Vectoring is the provision of navigational guidance to aircraft in the form of specific headings, based on the use of an ATS surveillance system.

RNAV 5 routes, this requirement is less onerous, aircraft are required to remain within 5 NM of the published route for 95% of the time (It should be noted that, actual conformance with these requirements is greater than "95% of the time [23]"). RNAV 5 routes subsequently require additional spacing than RNAV 1 routes and use the airspace less efficiently. In addition, the navigational performance of aircraft is independent of the route they are flying, i.e., an RNAV 1 equipped aircraft will remain within 1 NM of the published route independent of the route requirements. Subsequently the airspace is not using the optimal airspace volume as the airspace containment requirements for RNAV 5 routes are greater than those of RNAV 1 routes. Improvements to the required navigational accuracy mean that new routes can be safely positioned more closely to each other, which can enable more efficient utilisation of the airspace.

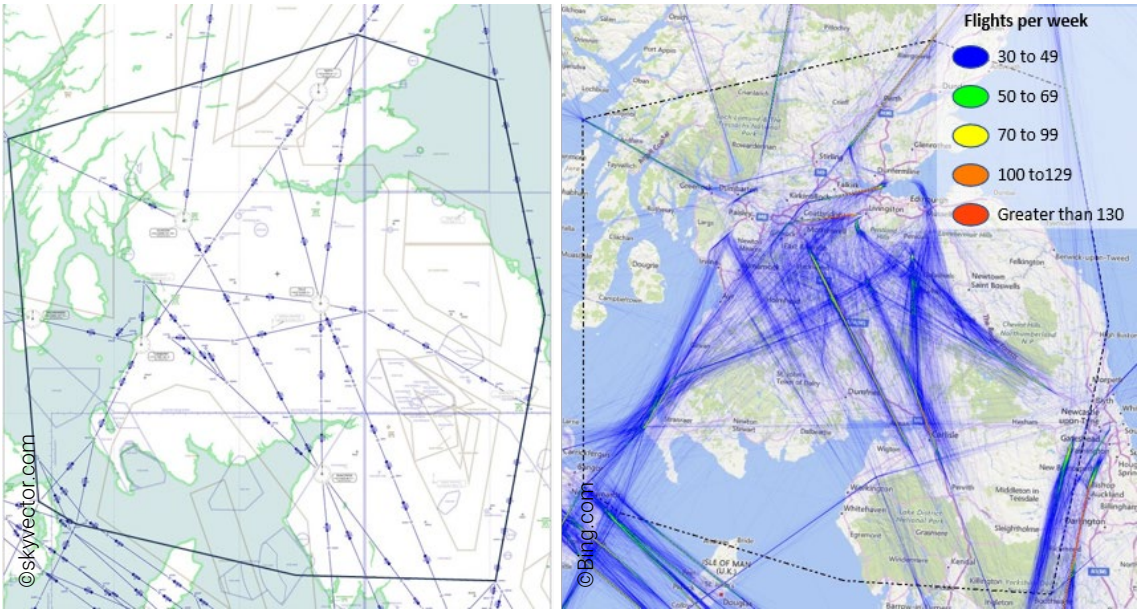


Figure 9: Left Figure- Lower ATS route Structure (FL70-250) within the ScTMA ACP area and, Right Figure- the density of flights (ATC Playback, (FL70-250, Aug 16-30 2023)).

5.2.6 For reference, the existing UK ATS route structure is defined in detail in the following sections of the UK AIP:

- ENR 3.2 AREA NAVIGATION ROUTES
- ENR 3.3 OTHER ROUTES.

5.3 Free Route Airspace (FRA)

5.3.1 FRA is a specified airspace within which users may freely plan a route between a defined entry point and a defined exit point, with the possibility to route via intermediate (published or unpublished) way points, without reference to the ATS route network, subject to airspace availability. Within this airspace, flights remain subject to air traffic control.

5.3.2 FRA is a requirement of the UK CAA's AMS (Reference 10) and mandated within UK law (The Air Traffic Management (Regulation (EU) No 716/2014) (Amendment) Regulations 2022 (legislation.gov.uk) following the withdrawal from the EU. In line with this requirement NATS is implementing FRA across the UK FIRs in four planned deployments. The impacted airspace above this ScTMA ACP is covered by FRA D1 and FRA D3.

5.3.3 In December 2021 NERL introduced the first deployment of FRA into the Scottish FIR. This airspace structure extends from FL255 up to FL660. FRA D3 is expected to be implemented prior to this ACP and as such is assumed to already exist (Figure 10). However, if this does not

[23] The statement '95% of the time' relates to the statistical probability of failures within the navigational system and does not equate to the actual level of accuracy that routes are flown where degradation is not present.

occur then connection to upper routes will be retained until such time as they are removed by FRA introduction. For details of the planned FRA D3 airspace change visit the ACP page here.

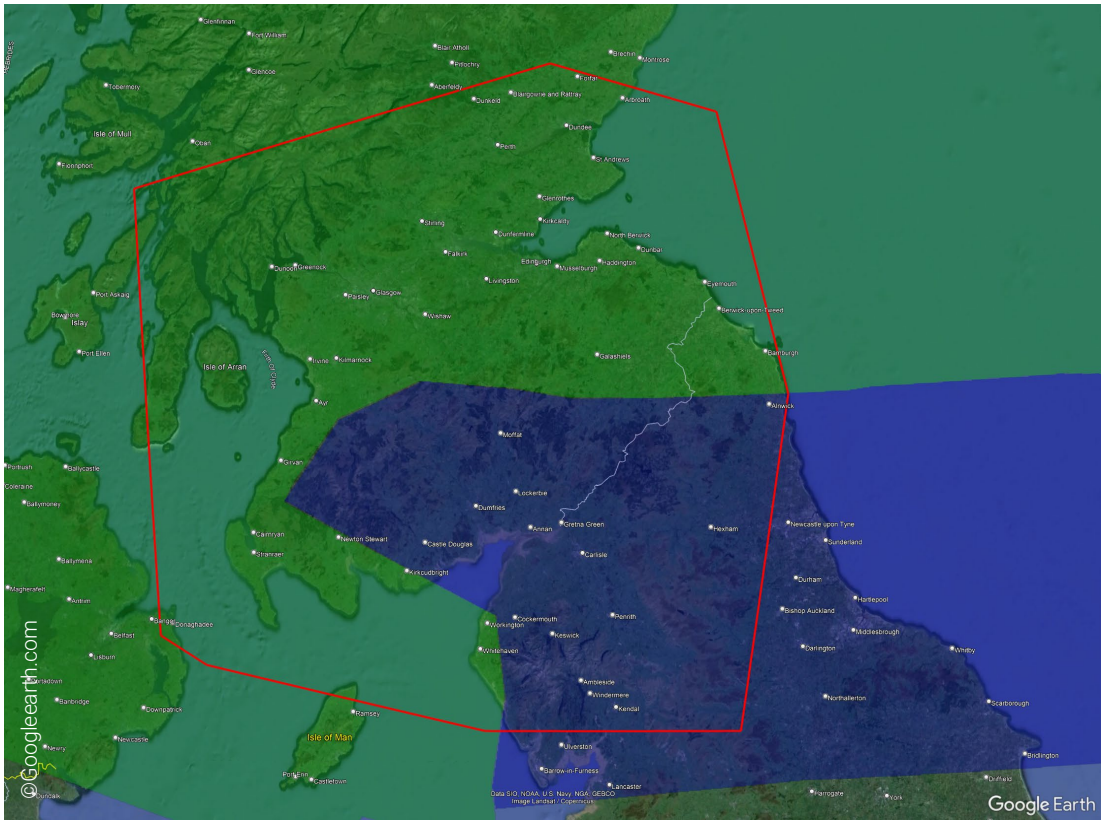


Figure 10: Location of existing UK FRA airspace (green polygon), planned FRA D3 deployment (blue polygon) and the lateral limits of this ACP (red polygon).

5.4 Standard Arrival Routes

5.4.1 IFR aircraft arriving at airports from the ATS route network follow a published procedure called a Standard Terminal Arrival Route (STAR). A STAR is a procedure that provides lateral and vertical (although actual descent is typically provided by ATC) guidance from the ATS route network to an Intermediate Approach Fix (IAF) from where aircraft can commence their approach.

5.4.2 For details of STARs serving Glasgow Airport or Edinburgh Airport see the relevant airport "Arrivals – Interface" sections below.

5.5 Holding

5.5.1 Ideally when aircraft arrive at the IAF at the end of a STAR there is no delay meaning they are able to commence their approach straight away. However, this is not always the case and aircraft are sometimes required to absorb delay. There are many reasons why aircraft may need to hold but the most common are that there is traffic in front of them, a problem with the runway, adverse weather or an emergency situation. Sometimes this delay can be absorbed during the en-route phase of flight by reducing speed, but this is not always sufficient or possible. Other times, aircraft are required to "hold" to achieve this.

5.5.2 A hold is a "racetrack" pattern flown by the aircraft at either a published location or at a location tactically instructed by ATC, a tactical hold. Tactical holds can be anywhere, and the required parameters are provided by ATC on *ad hoc* basis. This type of hold may be used when it is unsuitable to use the published hold i.e. if a problem with the runway is identified after the aircraft has left the hold or the hold is full. Published holds are detailed within the AIP which details the location (holding fix), direction, orientation, size and levels which can be flown. Within the NERL Airspace there are two types of published hold.

5.5.3 The first are en-route holds. These holds are high level and are used to absorb a delay before aircraft arrive at the terminal airspace. These en-route holds are outside the vertical limits of this change and will remain as currently described.

5.5.4 The second are terminal holds. These holds are lower level and are normally situated at the end of STARs for airports, positioned overhead the Holding Fix. They are used to absorb delay and aid with sequencing and spacing of aircraft as they commence the approach phase of flight. There are 7 published terminal holds within the ScTMA lateral limits above FL70. These holds are listed in Table 5 below:

Airport	Hold	Levels	Vicinity
Edinburgh	TARTN	FL70 – FL140	Westloch
Edinburgh/Glasgow	STIRA	FL70 – FL140	Tullibody
Glasgow	LANAK	FL70 – FL140	Birkenshaw
Glasgow	FYNER	FL70 – FL140	Kilbridemore
Glasgow	FOYLE	FL70 – FL140	Gartmore
Prestwick	TRN	6,000 ft – FL90	Turnberry
Prestwick	SUMIN	6,000 ft – FL90	Polgown

Table 5: Published terminal holds within the lateral limits of the ScTMA ACP.

5.5.5 Prestwick Airport are not amending their procedures as part of this change and therefore their holds will not be changing. They are included for information only as they may constrain the proposed design.

5.6 Controlled Airspace

5.6.1 Within the UK AIP, ENR 1.4 para 2.3.1 (Notifications) states that above FL 195 all airspace in the London and Scottish FIRs is notified as Class C Airspace. This includes all Control Areas and TMAs above FL 195 as notified within the respective FIRs and Upper Airspace Control Area - the London and Scottish UIR between FL 245 and FL 660 (which includes Free Route Airspace). These superfluous CTAs are proposed to be removed with a single CTA covering the airspace above FL195, simplifying the airspace design.

5.6.2 Between FL195 and FL70 (the vertical base of this change) there is a mixture of Class A, C, D, and E airspace which accommodates the ATS route structure serving the ScTMA. The location of CAS and the base of these CAS blocks is shown in Figure 11.

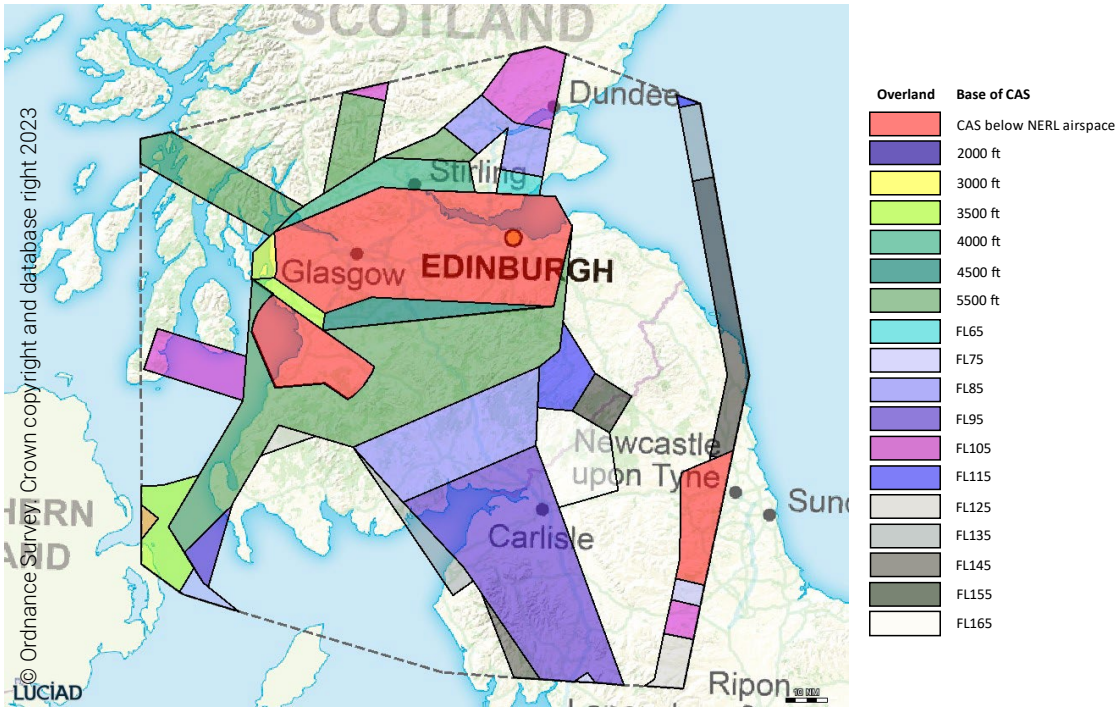


Figure 11: ATC Playback image showing the published bases of CAS (UKAIP) within the lateral limits of the NERL ScTMA ACP.

5.6.3 The CAS classification at the lowest levels shown in Figure 11 above is shown in Figure 12.

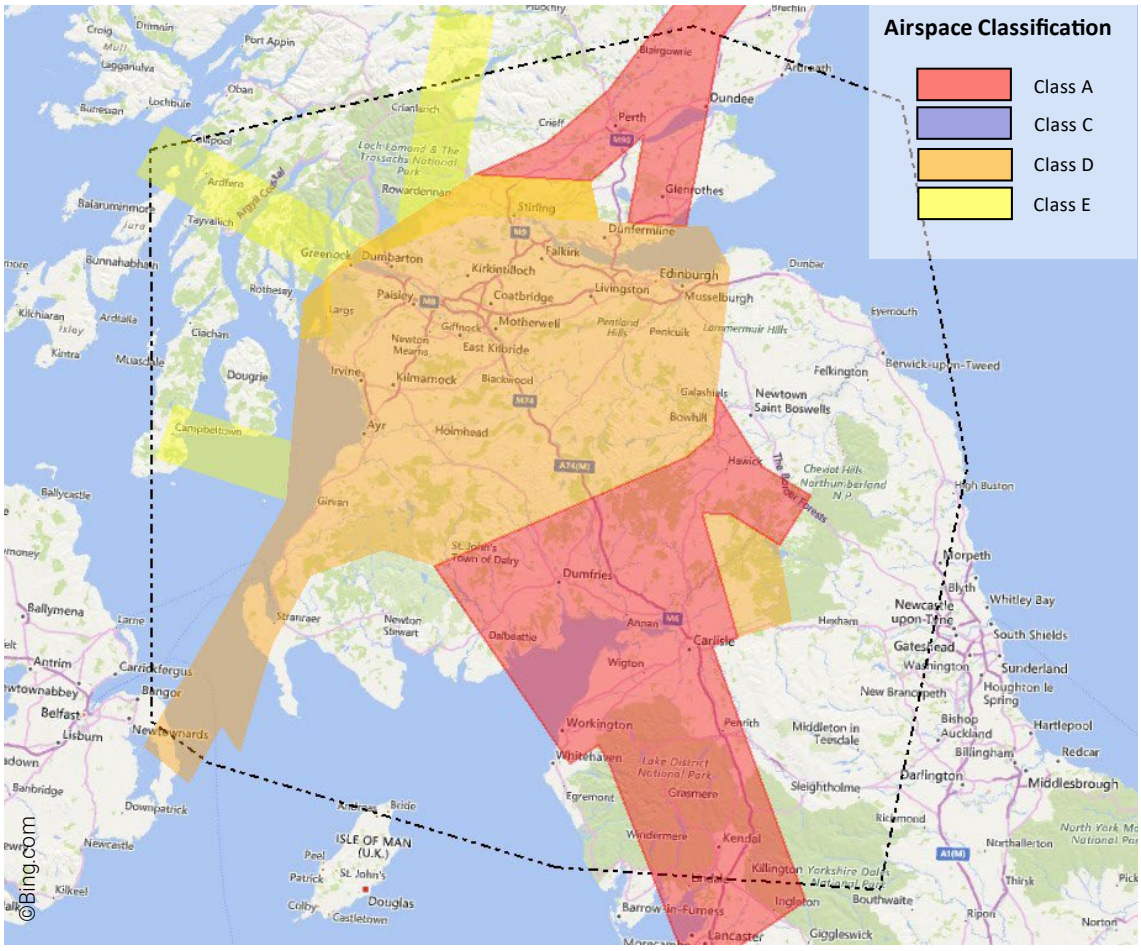


Figure 12: ATC Playback image showing the published airspace classification (UKAIP) of the lowest airspace structures between FL70 and FL195 for the principal flows serving the ScTMA.

5.6.4 The total CAS Volume split by airspace classification is shown in Table 6. For a list of CTAs that make up the airspace volumes see Annex D: Current Airspace. It should be noted that VFR flights are not able to access Class A airspace and any reduction in the volume of Class A, by release or re-classification of, airspace will increase availability, subject to ATC clearance, to VFR flights in this airspace.

Airspace Classification	Volume below FL195 (NM^3 to 1 d.p.)
A	6714.0
C	N/A
D	17,691.7
E	11964.2

Table 6: List of airspace classification and the combined classification volume.

5.7 Special Use Airspace

5.7.1 Special use airspace (SUA) is defined as:

5.7.2 Airspace of defined dimensions identified by an area on the surface of the earth wherein activities must be confined because of their nature and/or wherein limitations may be imposed upon aircraft operations that are not a part of those activities.

5.7.3 The types of airspace structures this includes, but is not limited to:

- Temporary Reserved Areas (TRAs)
- Danger Areas (DAs)
- Restricted Areas (RAs)
- Prohibited Areas (PAs).

5.7.4 SUAs may be active permanently, or more commonly, activated by NOTAM for periods of use. When a SUA is active, commercial aircraft are required to fly an alternate routeing avoiding that airspace structure as the preferred route is not available. SUAs outside of the ScTMA lateral limits may impact where aircraft enter the ScTMA airspace. This impact of SUA activation is impossible to predict due to the large number of combinations of SUA activity that are possible. Figure 13 below shows the SUAs in the vicinity of the ScTMA ACP that will have the greatest impact on airspace routings. For a full list of UK SUAs, their dimensions and hours of operation refer to the ENR 5 of the UK AIP.

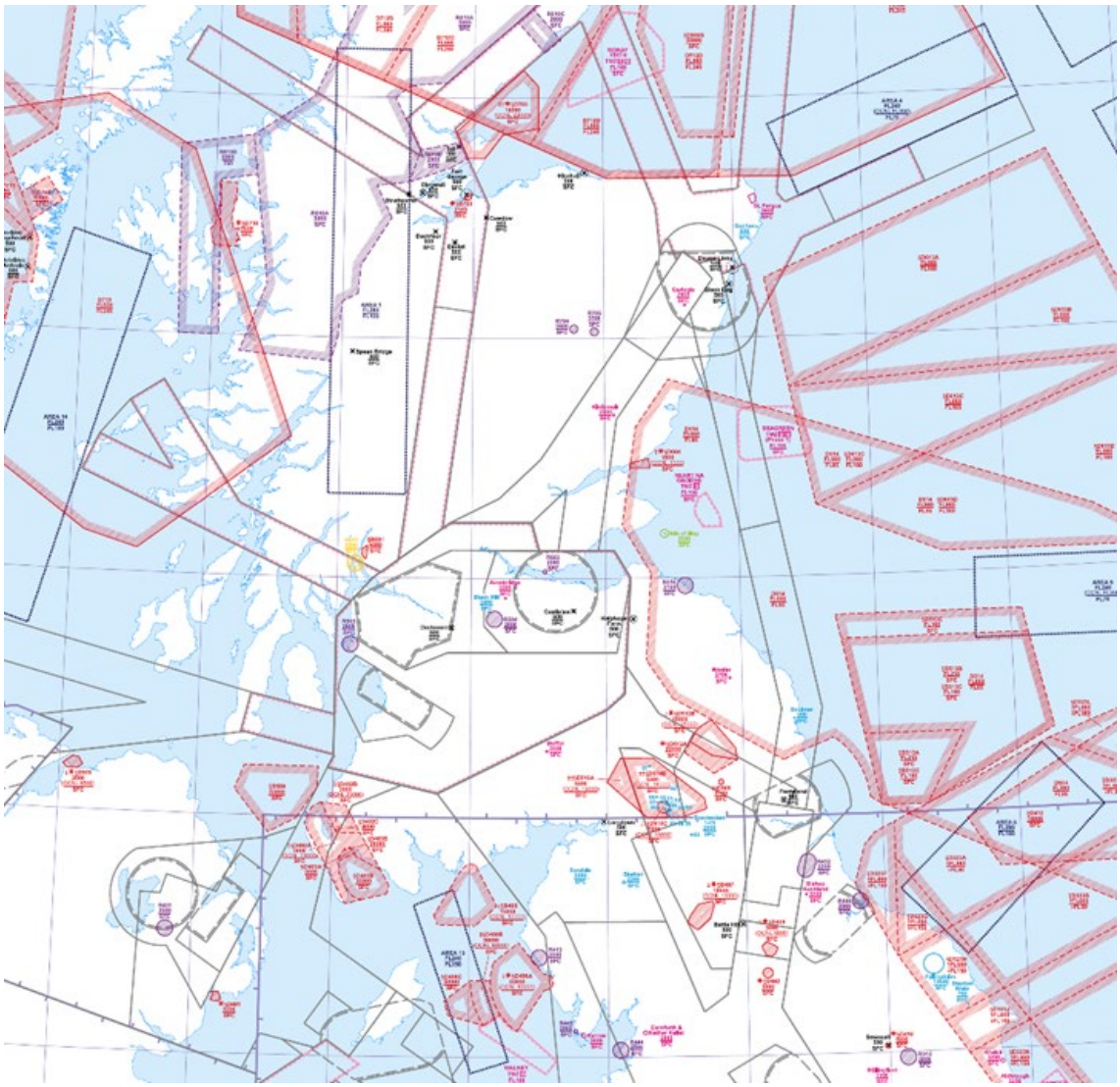


Figure 13: SUA airspace above FL70 in the vicinity of the ScTMA change. (ENR 6-75).

5.7.5 The lateral limits of SUAs within the vicinity of the NERL ScTMA change may require updating to accommodate the proposed design. The following SUAs are proposed to be updated:

- EGD514- Combat Airspace
- TRA004
- TRA007
- TRA008
- TRA(G)- Northumbria (North/South)
- TRA(G)- Portmoak
- TRA(G)- Scottish Lower.

5.8 Current Usage

5.8.1 In 2023 202,801 flights within the network transited the airspace impacted by this change (SFC-FL255).

5.8.2 These flights are broken down into Glasgow Airport, Edinburgh Airport, and Glasgow Prestwick Airport movements as well as overflights and are shown in Table 7. The 2023 movement data is based on Central Flow Management Unit (CFMU) figures which is flight plan data.

5.8.3 At the time of writing, the 2023 data is the most credible and up-to-date data available.

Edinburgh Airport	Glasgow Airport	Glasgow Prestwick Airport	Overflights	Total
115,423	68,408	8,714	10,256	202,801

Table 7: Breakdown of 2023 traffic numbers which is impacted by this change.

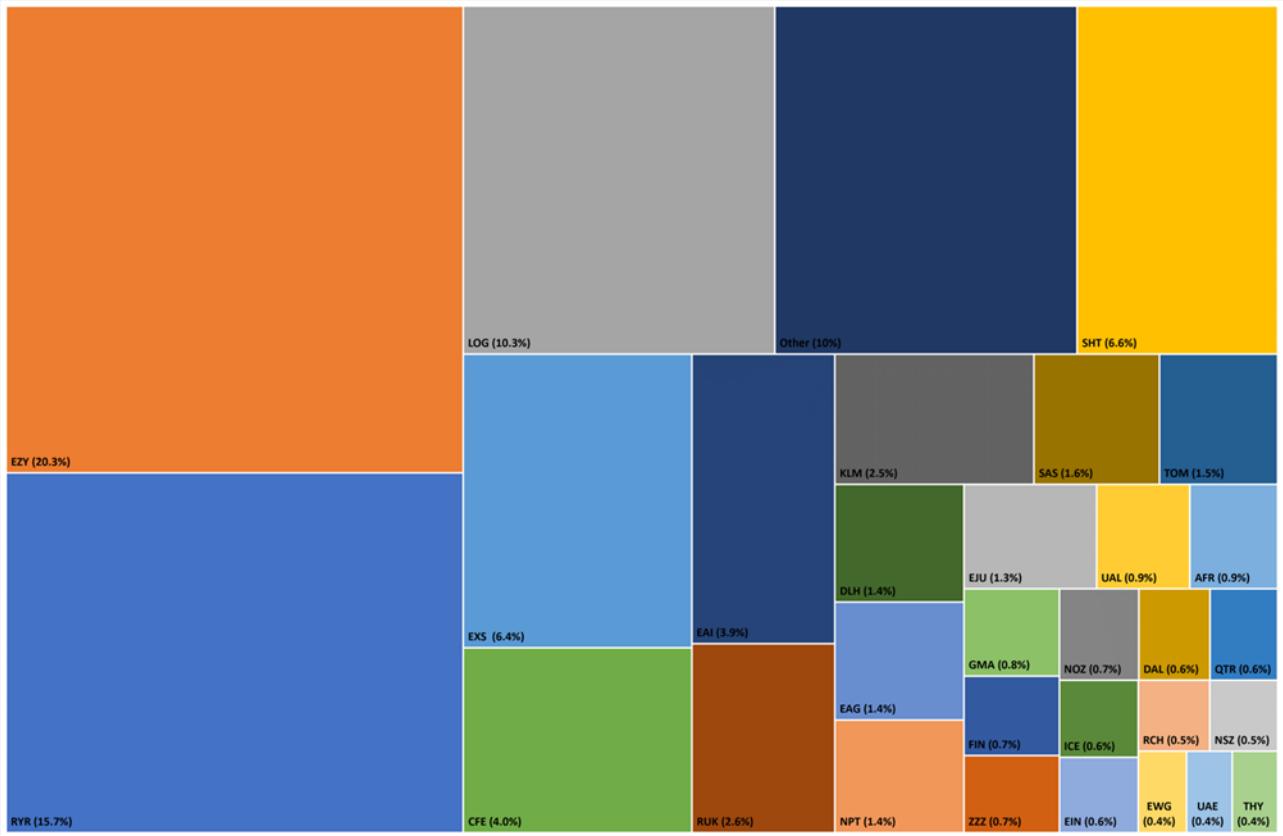
5.8.4 In Table 7 above, the 'current day' scenario is based on 2023. This is because the FOA for the Stage 3 submission of this ACP was started in 2024, and we had to use a full years' worth of data to generate forecasts and undertake some of the assessments. Following completion of the assessments and drafting of this consultation material, Glasgow Airport, Edinburgh Airport and NERL then submitted their Stage 3 documents to the CAA in August 2024.

5.8.5 We recognise that this means the 'current year' is now a number of years in the past, however this does not affect the main basis of the analysis which looks at the changes between the 'with airspace change' and 'without airspace change' scenarios in 2027 and 2036.

5.8.6 If you would like to see how movement numbers have changed since 2023, please see https://www.caa.co.uk/data-and-analysis/uk-aviation-market/airports/uk-airport-data/.

5.8.7 As part of Stage 4 of the airspace change process, we will undertake a Final Options Appraisal on the proposal developed following this consultation. At the point of undertaking this appraisal we will use the most up to date sources of data for all of the assessments within the appraisal.

5.8.8 Figure 14 shows the airlines and the proportions of flights which accounted for more than 0.4% of the total ScTMA traffic in 2023.



AFR (0.9%)	Air France	EZY (20.3%)	easyJet	RCH (0.5%)	US Airforce
CFE (4.0%)	BA CityFlyer	FIN (0.7%)	Finnair	RUK (2.6%)	Ryanair UK
DAL (0.6%)	Delta Air Lines	GMA (0.8%)	Gama Aviation	RYR (15.7%)	Ryanair
DLH (1.4%)	Lufthansa	ICE (0.6%)	Icelandair	SAS (1.6%)	Scandinavian Airlines
EAG (1.4%)	Emerald Airlines (UK)	KLM (2.5%)	KLM	SHT (6.6%)	British Airways
EAI (3.9%)	Emerald Airlines	LOG (10.3%)	Loganair	THY (0.4%)	Turkish Airlines
EIN (0.6%)	Aer Lingus	NOZ (0.7%)	Norwegian Air Shuttle	TOM (1.5%)	Tui Airways
EJU (1.3%)	easyJet Europe	NPT (1.4%)	West Atlantic UK	UAE (0.4%)	Emirates
EWG (0.4%)	Eurowings	NSZ (0.5%)	Norwegian Air Sweden	UAL (0.9%)	United Airlines
EXS (6.4%)	Jet2	QTR (0.6%)	Qatar Airways	ZZZ (0.7%)	No code assigned

Figure 14: List of operators which accounted for >0.4% of flights in 2023 (CFMU Planned data) and the proportion of these flights flown in the impacted airspace in 2023.

5.8.9 Figure 15 shows the aircraft types which accounted for more than 0.5% of the total traffic flying within the impacted airspace in 2023. The most common aircraft types are single aisle twin engine jets such as the A320 and B737. It should be noted that in 2024 Loganair has replaced their Saab 340 (single aisle, twin turbojet aircraft) fleet with a mix of comparable ATR42/72s (single aisle, twin turbojet aircraft).

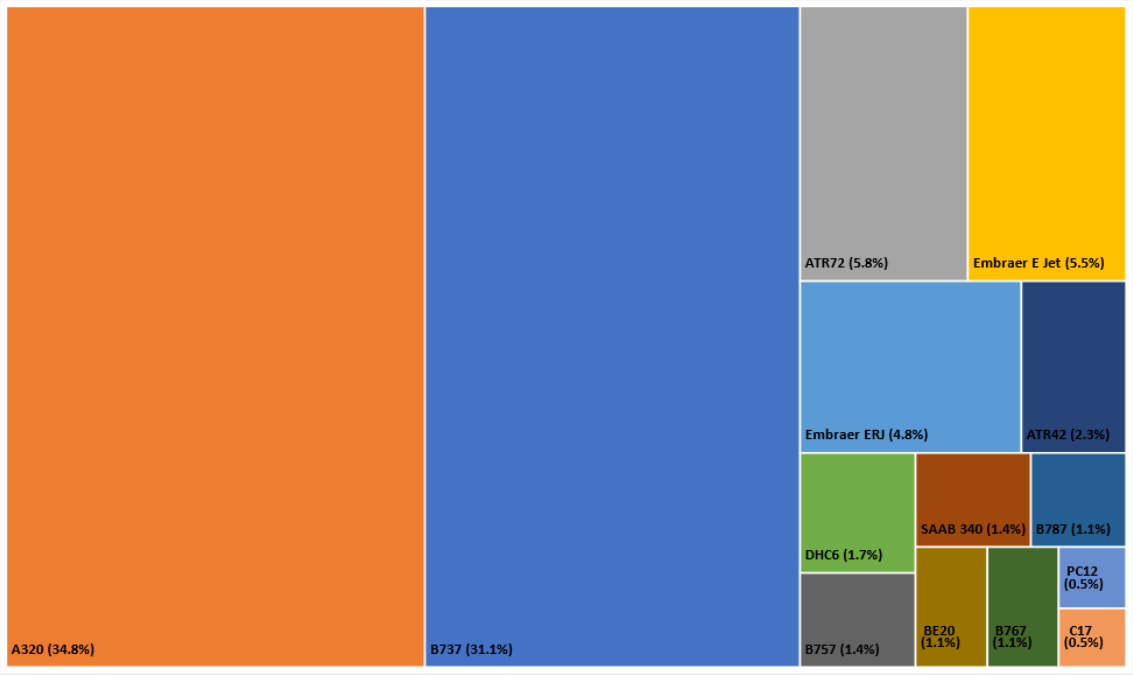


Figure 15: List of aircraft types which accounted for >0.5% of flights in 2023 (CFMU Planned data) and the proportion of these flights flown in the impacted airspace in 2023.

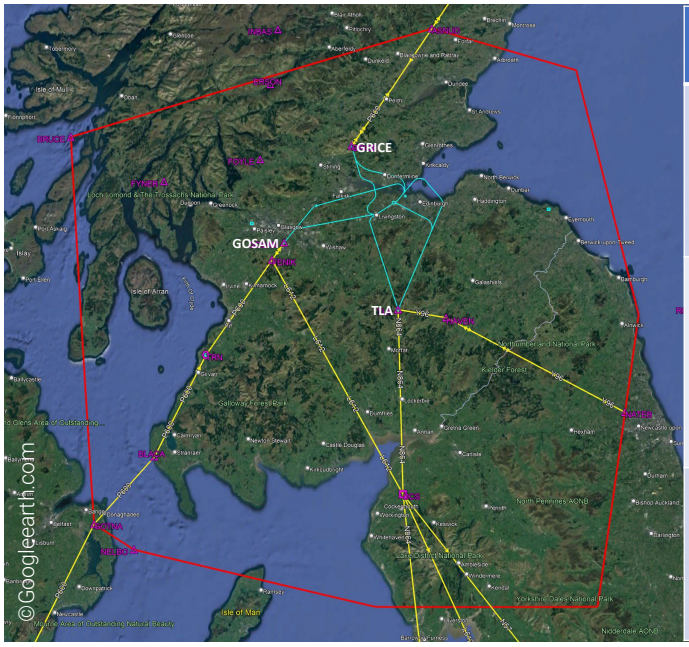
5.8.10 Edinburgh Airport and Glasgow Airport have provided forecast data for 2027, the year of planned implementation, to 2036, 10 years planned post implementation for their respective operations. For details of the airports traffic forecasts see the respective ACPs. The remaining ScTMA traffic has been grown from the 2023 traffic (without the Edinburgh Airport and Glasgow Airport traffic) using the NATS 2023 long term forecast. This forecast is based on the Eurocontrol STATFOR forecast but has been adapted to make it more relevant for the UK as opposed to Europe overall. The forecast traffic data is shown in Table 8 below:

Year	Edinburgh Airport	Glasgow Airport	Overflights	Total
2027	147,539	90,862	20,190	258,591
2028	150,016	91,487	20,342	261,845
2029	152,492	92,113	20,494	265,099
2030	154,969	92,738	20,647	268,353
2031	157,445	93,363	20,799	271,607
2032	159,922	93,989	20,951	274,862
2033	162,398	94,614	21,103	278,116
2034	164,875	95,239	21,256	281,370
2035	167,351	95,865	21,408	284,624
2036	169,828	96,490	21,560	287,878

Table 8: Forecast growth of traffic impacted by this change; 2027 (implementation year) to 2036 (10 years post implementation.

5.9 Edinburgh Interface - Departures

5.9.1 Most IFR aircraft departing Edinburgh Airport follow a published procedure called a SID. A SID is a published procedure that provides lateral and vertical guidance and are followed unless instructed by ATC. The SIDs serving Edinburgh Airport are being updated as part of the Edinburgh Airport's ACP and are referenced here for information only. The SID which is used is determined from the runway in use [24] and the onward route described in the submitted flight plan. The Edinburgh SIDs and the destinations countries of aircraft flying these SIDs in 2023 are shown below in Figure 16. It should be noted that flight planned SIDs are subject to tactical optimisation and an aircraft may fly a different SID to the one the table suggests.



SID	Destination Countries (2023)
GOSAM	Albania, Austria, Barbados, Belgium, Bermuda, Bulgaria, Canada, Canary Islands, China, Costa Rica, Egypt, Finland, France, Germany, Gibraltar, Greece, Iceland, India, Israel, Italy, Kenya, Luxembourg, Malta, Mexico, Morocco, Netherlands, Portugal, Republic of Ireland, Romania, Saint Martin, Spain, Switzerland, Turkey, UAE, UK, and USA
TLA	Albania, Austria, Belgium, Bulgaria, China, Croatia, Cyprus, Czech Republic, Denmark and the Faroe Islands, Egypt, France, Germany, Greece, Hong Kong, Hungary, India, Israel, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, North Macedonia, Norway, Poland, Qatar, Republic of Ireland, Romania, Saudi Arabia, Slovakia, South Korea, Spain, Sweden, Switzerland, Tunisia, Turkey, UAE, and UK
GRICE	Belgium, Bulgaria, Canada, China, Denmark and the Faroe Islands, Finland, France, Germany, Greenland, Hungary, Iceland, India, Italy, Latvia, Lithuania, Netherlands, Norway, Poland, Romania, Serbia and Montenegro, Slovakia, Spain, Sweden, Switzerland, Turkey, UK, and USA

Figure 16: Lateral track of Edinburgh Airports SIDs (turquoise lines), the main ATS routes they connect to within the ScTMA (yellow lines) and the destination countries flown to in 2023 via each SID.

5.9.2 The extant Edinburgh Airport SIDs all terminate at 6,000 ft. Adherence to published routings is greatest at low levels but as aircraft get higher, ATC routinely climb and vector or instruct aircraft to fly a more expeditious routings providing benefit. Figure 17 shows the track density of flights departing Edinburgh Airport between 16 – 22 August 2023 between 7,000 ft and FL250 [25]. This shows aircraft are regularly above the 6,000 ft before the end of the SID and are vectored away from the SID centrelines towards the ATS route network.

[24] SIDs are named after their end point and will have a procedure from each runway to this common end point. Each procedure is a separate SID but are commonly referred to by their endpoint.
[25] For this week, Edinburgh Airport were using the Westerly runway for 60% of departures and the easterly runway for 40% of departures.

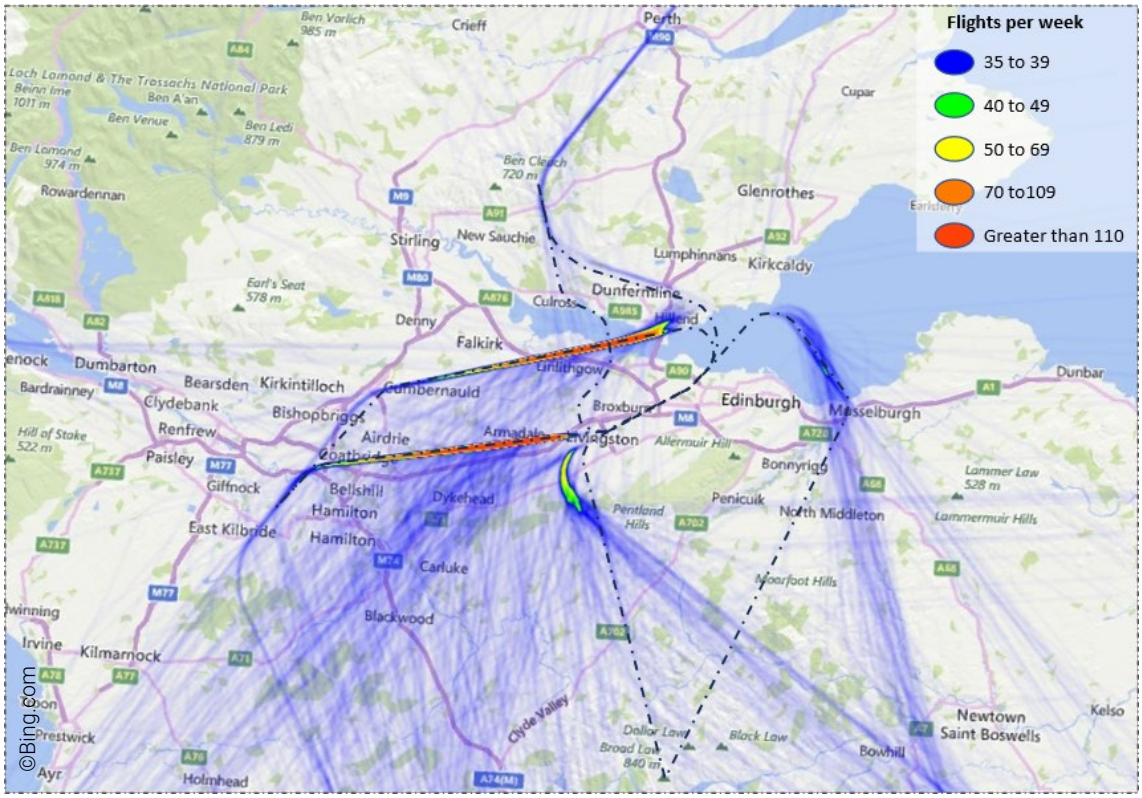


Figure 17: ATC Playback image showing the track density of flights departing Edinburgh Airport between FL70 and FL250 for the week 16 -22 August 2023. Existing SIDs are shown as a dotted lines.

5.10 Edinburgh Interface - Arrivals

5.10.1 Aircraft arriving at Edinburgh Airport from the ATS route network follow a published procedure called a STAR. A STAR provides lateral and vertical guidance from the ATS route network to an IAF from where aircraft can commence their approach. Edinburgh Airport currently has five STARs which are shown below in Figure 18 and described in Table 9 below, for full details see the following sections of the UK AIP:

- AD 2.22 EGPH FLIGHT PROCEDURES
- AD 2.24 EGPH CHARTS RELATING TO AN AERODROME.

5.10.2 The STARs serving Edinburgh Airport are currently specified as RNAV 5 procedures.

5.10.3 Within UK airspace, a hold is typically situated overhead the IAF and is used when ATC are required to delay aircraft due to inaccessibility of the runway. [26] STARs are followed, and aircraft hold unless instructed by ATC. When arriving at a hold, aircraft are assigned the lowest level available in the hold on a first come first served basis. Standard practice is for aircraft to be cleared by ATC to the next lowest level once it is vacated by the preceding aircraft. Upon reaching the lowest level aircraft commence their approach once instructed by ATC.

5.10.4 Edinburgh Airport currently has 2 holds situated at the end of their STARs. The closest, TARTN, is situated approximately 16 miles south of Edinburgh Airport and operates between FL70 and FL140. This hold is used by aircraft arriving from the southerly routes. The furthest, STIRA is shared with Glasgow Airport arrivals. STIRA is situated approximately 19 miles northwest of Edinburgh Airport and operates between FL70 and FL140. This hold is used by aircraft arriving from the northerly routes. Complexity is added to the ATC task for this hold due to the requirement to manage aircraft arriving at more than one airfield.

[26] The runway may be inaccessible due, but not limited to weather, runway blockage, runway change, airspace congestion or a priority flight.

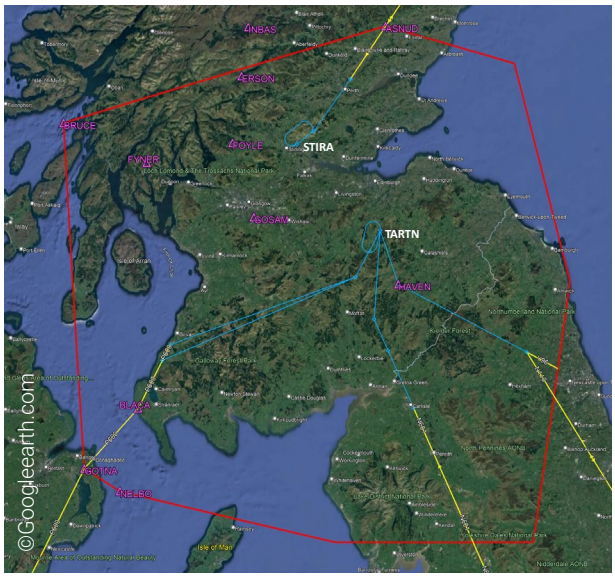


Figure 18: Lateral track of STARs used by aircraft arriving at Edinburgh Airport (light blue lines), the main ATS routes they connect to within the ScTMA (yellow lines).

5.10.5 Details of the STARs serving Edinburgh Airport are shown in Table 9 below:

STAR (Specification)	Number of aircraft filed in 2023	ATS Route	Route (Level Restrictions)	Terminal Hold
PTH 1G (RNAV 5)	3519	P600	PTH – GRICE – STIRA (FL70)	STIRA
INPIP 1E (RNAV 5)	30266	(U)N601	INPIP (FL260) – INREV (FL200) – ESKDO – TARTN (FL70)	TARTN
AGPED 1E (RNAV 5)	11913	Y96 N110	AGPED (FL260) – HAVEN – TARTN (FL70)	
TUNSO 1E (RNAV 5)	9741	P600	TUNSO (FL170) – TLA – TARTN (FL70)	
GIRVA 1E (RNAV 5)	427	P600	GIRVA (FL120) – TLA – TARTN (FL70)	

Table 9: STARs serving Edinburgh Airport, listed from northeast clockwise.

5.10.6 For details of how the low-level airspace is currently used and any planned changes to this low-level airspace please refer to the Edinburgh Airport ACP here.

5.11 Edinburgh Holds- STIRA

5.11.1 The STIRA hold is a shared hold between Edinburgh Airport and Glasgow Airport for aircraft arriving via the Perth (PTH) STARs and for arrivals into Edinburgh Airport from the NATs. Currently, aircraft arriving from the NATs into STIRA do not follow a STAR but are routed tactically across the northern portion of the ScTMA towards STIRA.

5.11.2 The STIRA hold is situated approximately 19 miles northwest of Edinburgh Airport and operates between FL70 and FL140. In 2023, 91 aircraft were held in the STIRA hold with an average duration of 5 minutes 59 s. Fifty-nine of these aircraft were inbound to Edinburgh Airport. On average this hold was used less than once per day and the highest number of aircraft holding in one day was 3. The highest terrain in the region of STIRA overflight is Ben Cleuch (2366 ft) in the Ochil Hills. The STIRA hold does not overfly any National Scenic Areas (NSAs), National Parks or National Landscapes.

5.11.3 A 1,900 m [27] overflight buffer was applied to the published hold area to estimate the population overflown and this hold was calculated to overfly 41,973 people. The highest population overflown were at an elevation of 873 ft.

5.11.4 The holding statistics for the STIRA hold are shown below in Table 10.

STIRA (2023)	
Levels	FL70 – FL140
Highest Terrain	2,366 ft
Total Aircraft Holding (Edinburgh inbounds)	91 (59)
Average Daily holding	<1 per day
Highest daily holding	3
Average Hold duration	5 min 59 s
Population overflown by hold	41,973
Highest population elevation	873 ft

Table 10: Holding statistics for the STIRA hold for Edinburgh Airport.

5.11.5 Complexity is added to the ATC task for this hold due to the requirement to manage aircraft arriving at more than one airfield.

5.12 Edinburgh Holds- TARTN

5.12.1 The TARTN hold is for aircraft arriving at Edinburgh Airport via the AGPED, GIRVA, INPIP and TUNSO STARs. It is situated approximately 16 miles south of Edinburgh Airport and operates between FL70 and FL140. In 2023, 1096 aircraft were held in the TARTN hold with an average duration of 6 minutes 34 s. On average this hold was used approximately 3 times per day and the highest number of aircraft holding in one day was 32. The highest hold occupancy [28] was 6.

5.12.2 The highest terrain in the region of TARTN overflight is Dunslair Heights (1975 ft) in the Moorfoot Hills. The TARTN hold partially overflies the Upper Tweedale NSA, 43.0 km^2.

5.12.3 A 1,900 m overflight buffer was applied to the published hold area to estimate the population overflown and this hold was found to overfly 10,239 people. The highest population overflown were at an elevation of 1,066 ft.

5.12.4 The holding statistics for the TARTN hold are shown below in Table 11.

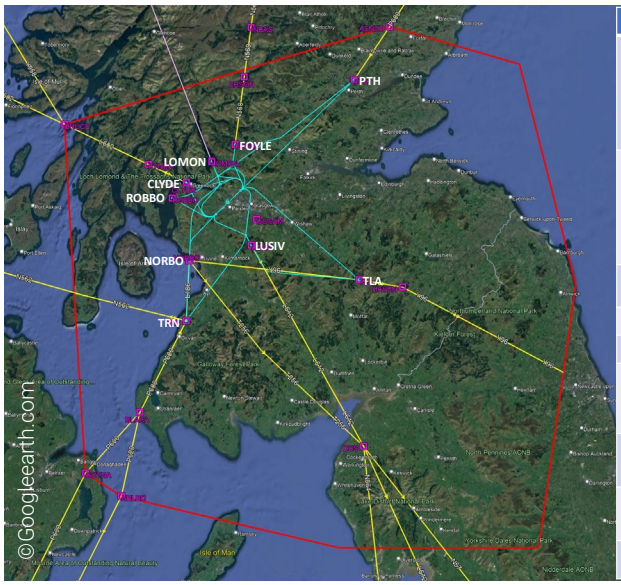
[27] CAP1498 defines overflight at 7,000 ft as 1,888 m. below 7,000 ft, this buffer should be smaller, however a 1,900 m buffer was used to provide a worst-case scenario to ensure all relevant population is captured.
[28] Hold occupancy is the number of aircraft within the hold at a given time.

TARTN (2023)	
Levels	FL70 – FL140
Highest Terrain	1,975 ft
Total Aircraft Holding	1,096
Average Daily holding	~3 per day
Highest daily holding	32
Average Hold duration	6 min 34 s
Population overflown by hold	10,239
Highest population elevation	1,066 ft
National Landscape/National Park/ NSA area overflown	43.0 km^2

Table 11: Holding statistics for the TARTN hold for Edinburgh Airport.

5.13 Glasgow Interface- Departures

5.13.1 Most IFR aircraft departing Glasgow Airport follow a published procedure called a SID. The SIDs serving Glasgow Airport are being updated as part of the Glasgow Airport ACP and are discussed here for information only. The Glasgow Airport SIDs and the destinations countries of aircraft flying these SIDs in 2023 are shown below in Figure 19. It should be noted that flight planned SIDs are subject to tactical optimisation and an aircraft may fly a different SID to the one the table suggests.



SID	Destination Countries (2023)
NORBO	Algeria, Austria, Bahrain, Barbados, Belgium, Bulgaria, Canada, Canary Islands, Cape Verde, Croatia, Cyprus, Czech Republic, Denmark and the Faroe Islands, Egypt, Finland, France, Germany, Gibraltar, Greece, Greenland, Hungary, Iceland, Italy, Jamaica, Jordan, Luxembourg, Malta, Mexico, Morocco, Netherlands, Oman, Poland, Portugal, Puerto Rico, Republic of Ireland, Romania, Spain, Sweden, Switzerland, Tunisia, Turkey, UAE, UK, and USA
CLYDE	Armenia, Austria, Barbados, Belgium, Bulgaria, Canada, Canary Islands, Croatia, Cyprus, Czech Republic, Denmark and the Faroe Islands, Estonia, France, Georgia, Germany, Greece, Greenland, Hong Kong, Hungary, Iceland, Israel, Italy, Jamaica, Latvia, Malta, Mexico, Netherlands, Norway, Oman, Poland, Portugal, Republic of Ireland, Serbia and Montenegro, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey, UAE, UK, and USA
ROBBO	Austria, Canada, France, Greece, Iceland, Italy, Netherlands, Republic of Ireland, Spain, and UK
TRN	France, Republic of Ireland, Switzerland, and UK
LOMON	Canada, France, Iceland, Switzerland, UK, and USA
PTH	Austria, Croatia, Cyprus, Denmark and the Faroe Islands, Finland, France, Germany, Greece, Hungary, India, Italy, Lithuania, Netherlands, Norway, Poland, Republic of Ireland, Romania, Slovakia, Spain, Sweden, Switzerland, Turkey, UAE, and UK
FOYLE	Canada, Cyprus, Denmark and the Faroe Islands, France, Germany, Greece, Iceland, Netherlands, Sweden, Switzerland, Turkey, UAE, UK, and USA
LUSIV	Belgium, China, Czech Republic, Denmark and the Faroe Islands, France, Germany, Luxembourg, Netherlands, Serbia and Montenegro, Sweden, Switzerland, and UK
TLA	Austria, Cyprus, Germany, Italy, Netherlands, Poland, Switzerland, and UK

Figure 19: Lateral track of Glasgow Airports SIDs (turquoise lines), the main ATS routes they connect to within the ScTMA (yellow lines) and the destination countries flown to in 2023 via each SID.

5.13.2 The Glasgow Airport SIDs all terminate at 6,000 ft. Adherence to published routings is greatest at low levels but as aircraft get higher, ATC routinely climb and vector or instruct aircraft to fly a more expeditious routings providing benefit. Figure 20 shows the track density of flights departing Glasgow airport between 16–22 August 2023 between 7,000 ft and FL250 [29]. This shows aircraft are regularly above the 6,000 ft before the end of the SID and are vectored away from the SID centrelines towards the ATS route network.

[29] For this week, Glasgow Airport were using the Westerly runway for 61% of departures and easterly runway for 39% of departures.

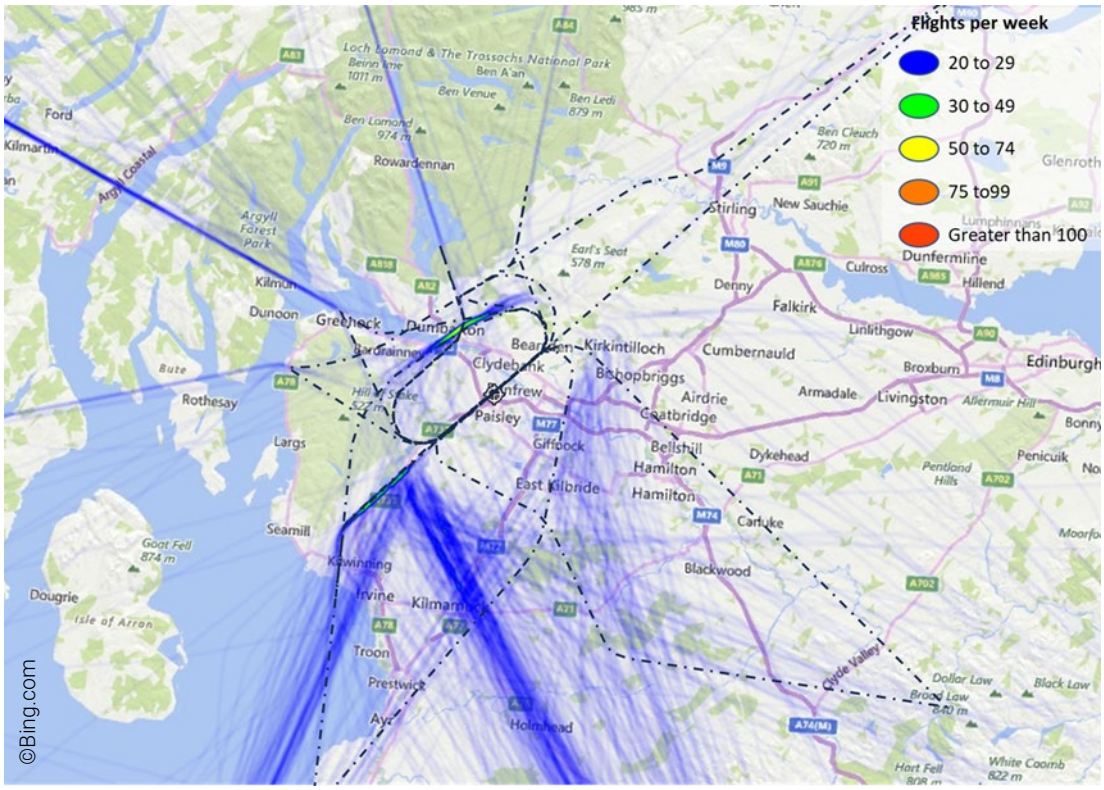


Figure 20: ATC Playback image showing the track density of flights departing Glasgow Airport between FL70 and FL250 for the week 16 -22 August 2023. Existing SIDs are shown as a dotted lines.

5.14 Glasgow Interface- Arrivals

5.14.1 Aircraft arriving at Glasgow Airport from the ATS route network follow a STAR. Glasgow Airport currently has seven STARs which are shown below in Figure 21 and described in Table 12 below. The STARs serving Glasgow Airport are currently specified as RNAV 5 procedures. For full details see the following sections of the UK AIP:

- AD 2.22 EGPF FLIGHT PROCEDURES
- AD 2.24 EGPF CHARTS RELATING TO AN AERODROME.

5.14.2 Glasgow Airport currently has 4 holds situated at the end of their STARs. The closest, FOYLE is situated approximately 16 miles north of Glasgow Airport and operates between FL70 and FL140. This hold is used by aircraft arriving from the north of the ScTMA via N560. The second closest hold is LANAK. LANAK is situated approximately 19 miles east-southeast of Glasgow Airport and operates between FL70 and FL140. This hold is used by aircraft arriving from the southerly routes arriving at the ScTMA. The third closest hold is FYNER. FYNER is situated approximately 23 miles north-northwest of Glasgow Airport and operates between FL70 and FL140. This hold is used by aircraft arriving from the west of the ScTMA via L602 and Y958 as well as aircraft arriving from FRA. The furthest, STIRA is shared with Edinburgh Airport arrivals. STIRA is situated approximately 23 miles east northeast of Glasgow Airport and operates between FL70 and FL140. This hold is used by aircraft arriving from the north of the ScTMA via P600. Complexity is added to the ATC task for this hold due to the requirement to manage aircraft arriving at more than one airfield.

Figure 21: Lateral track of STARs used by aircraft arriving at Glasgow Airport (light blue lines), the main ATS routes they connect to within the ScTMA (yellow lines).

STAR (Specification)	Number of aircraft filed in 2023	ATS Route	Route (Level Restrictions)	Terminal Hold
PTH 1G (RNAV 5)	750	P600	PTH - GRICE – STIRA (FL70)	STIRA
AGPED 1G (RNAV 5)	4691	Y96 N110	AGPED (FL260) – HAVEN – TLA – LANAK (FL70)	LANAK
APPLE 1G (RNAV 5)	1396	UN590	APPLE – ASLIB (FL260) – ENIPI – ODIGI (FL200) – VAPPI – LANAK (FL70)	
RIBEL 1G (RNAV 5)	14324	(U)N601	RIBEL – NISKA – ASLIB (FL260) – ENIPI – ODIGI (FL200) – VAPPI – LANAK (FL70)	
BLACA 1G (RNAV 5)	6905	P600	BLACA –GIRVA (FL150) – TRN –LANAK (FL70)	
BRUCE 1G (RNAV 5)	2537	L602 Y958 FRA	BRUCE –FYNER (FL90)	FYNER
ERSON 1G (RNAV 5)	501	N560	ERSON –FOYLE (FL90)	FOYLE

Table 12: STARs serving Glasgow Airport, listed from Northeast Clockwise.

5.14.3 For details of how the low-level airspace is currently used and any planned changes to this low-level airspace please refer to the Glasgow Airport ACP here.

5.15 Glasgow Holds- STIRA

5.15.1 The STIRA hold is a shared hold between Edinburgh Airport and Glasgow Airport for aircraft arriving via the Perth (PTH) STARs. It is situated approximately 23 miles east northeast of Glasgow Airport and operates between FL70 and FL140. In 2023, 91 aircraft were held in the STIRA hold with an average duration of 5 minutes 59 s. Thirty-two of these aircraft were inbound to Glasgow Airport. On average this hold was used less than once per day and the highest number of aircraft holding in one day was three.

5.15.2 The highest terrain in the region of STIRA overflight is Ben Cleuch (2,366 ft) in the Ochil Hills. The LANAK hold does not overfly any NSAs, National Parks or National Landscapes.

5.15.3 A 1,900 m overflight buffer was applied to the published hold area to estimate the population overflown and this hold was found to overfly 41,973 people. The highest population overflown were at an elevation of 873 ft.

5.15.4 The holding statistics for the STIRA hold are shown below in Table 13.

STIRA (2023)	
Levels	FL70 – FL140
Highest Terrain	2,366 ft
Total Aircraft Holding (Glasgow inbounds)	91 (32)
Average Daily holding	<1 per day
Highest daily holding	3
Average Hold duration	5 min 59 s
Population overflown by hold	41,973
Highest population elevation	873 ft

Table 13: Holding statistics for the STIRA hold for Glasgow Airport.

5.15.5 Complexity is added to the ATC task for this hold due to the requirement to manage aircraft arriving at more than one airfield.

5.16 Glasgow Holds- LANAK

5.16.1 The LANAK hold is for aircraft arriving at Glasgow Airport via the AGPED, APPLE, RIBEL or BLACA STARs. It is situated approximately 19 miles east-southeast of Glasgow Airport and operates between FL70 and FL140. In 2023, 462 aircraft were held in the LANAK hold with an average duration of 10 minutes 2 s. On average this hold was used once to twice per day and the highest number of aircraft holding in one day was 16. The highest hold occupancy was 4.

5.16.2 The highest terrain in the region of LANAK overflight to the southwest of Lanark, (1,080 ft). The LANAK hold does not overfly any NSAs, National Parks or National Landscapes.

5.16.3 A 1,900 m overflight buffer was applied to the published hold area to estimate the population overflown and this hold was found to overfly 76,084 people. The highest population overflown were at an elevation of 1,000 ft.

5.16.4 The holding statistics for the LANAK hold are shown below in Table 14.

LANAK (2023)	
Levels	FL70 – FL140
Highest Terrain	1,080 ft
Total Aircraft Holding	462
Average Daily holding	1 - 2 per day
Highest daily holding	16
Average Hold duration	10 min 2 s
Population overflown by hold	76,084
Highest population elevation	1,000 ft

Table 14: Holding statistics for the LANAK hold for Glasgow Airport.

5.17 Glasgow Holds- FYNER

5.17.1 The FYNER hold is for aircraft arriving at Glasgow Airport via the BRUCE STAR. It is situated approximately 23 miles north-northwest of Glasgow Airport and operates between FL70 and FL140. In 2023, 23 aircraft were held in the FYNER hold with an average duration of 2 minutes 32 s. On average this hold was used less than once per day and the highest number of aircraft holding in one day was 1.

5.17.2 The highest terrain in the region of FYNER overflight is Beinn Mhòr (2,432 ft) within the Loch Lomond and The Trossachs National Park. The FYNER hold partially overflies the Loch Lomond and The Trossachs National Park, 51.2 km^2.

5.17.3 A 1,900 m overflight buffer was applied to the published hold area to estimate the population overflown and this hold was found to overfly 655 people. The highest population overflown were at an elevation of 300 ft.

5.17.4 The holding statistics for the FYNER hold are shown below in Table 15.

FYNER (2023)	
Levels	FL70 – FL140
Highest Terrain	2,432 ft
Total Aircraft Holding	23
Average Daily holding	<1 per day
Highest daily holding	1
Average Hold duration	2 min 32 s
Population overflown by hold	655
Highest population elevation	300 ft
National Landscape/National Park/ NSA area overflown	51.2 km^2

Table 15: Holding statistics for the FYNER hold for Glasgow Airport.

5.18 Glasgow Holds- FOYLE

5.18.1 The FOYLE hold is for aircraft arriving at Glasgow Airport via the ERSON STAR. It is situated approximately 16 miles north of Glasgow Airport and operates between FL70 and FL140. In 2023, no aircraft were held in the FOYLE hold.

5.18.2 The highest terrain in the region of FOYLE overflight is Ben Ledi (2,884 ft) within the Loch Lomond and The Trossachs National Park. The FOYLE hold partially overflies the Loch Lomond

and The Trossachs National Park, 120.3 km^2 which includes part of The Trossachs NSA, 18.6 km^2.

5.18.3 A 1,900 m overflight buffer was applied to the published hold area to estimate the population potentially overflown and this hold was found to overfly 2,971 people. The highest population overflown were at an elevation of 695 ft.

5.18.4 The holding statistics for the FOYLE hold are shown below in Table 16.

FOYLE (2023)	
Levels	FL70 – FL140
Highest Terrain	2,884 ft
Total Aircraft Holding	0
Average Daily holding	0
Highest daily holding	0
Average Hold duration	0
Population overflown by hold	2,971
Highest population elevation	695 ft
National Landscape/National Park/ NSA area overflown	120.3 km^2

Table 16: Holding statistics for the FOYLE hold for Glasgow Airport.

5.18.5 For details of how the low-level airspace is currently used please refer to the Glasgow Airport ACP here.

5.19 Other Airports and ANSPs

Other Airports

5.19.1 The airspace impacted by this change is used by aircraft arriving to and departing from a number of other airfields situated under or adjacent to the change area. These include but are not limited to:

- Glasgow Prestwick
- Dundee
- Cumbernauld.

5.19.2 With the exception of Glasgow Prestwick, these airports do not have published STARs or SIDs. Aircraft will continue to be directed to and from these airfields as per the current operation with no change in flight paths below 7,000 ft. STARs serving Glasgow Prestwick Airport will require updating to align with the updated ATS route structure. Link routes will be provided to Glasgow Prestwick Airport's SID end points and will replicate the current planned routes.

Adjacent ANSPs

5.19.3 The airspace affected by this ACP is contained within the Scottish and London FIRs and does not impact any cross-border procedures.

6. Proposed Changes

6.1 Justification

6.1.1 This airspace change is being completed under the FASI-N programme. This programme seeks to modernise the UK's airspace and air transport route network and is an important part of implementing the Government's transport policy. It involves airlines, airports, air traffic control and many other aviation stakeholders. The changes described herein are aligned with the DfT's and CAA's AMS (Reference 10).

6.1.2 Today's ATS route network has evolved over time but has not undergone a complete redesign since its implementation. Subsequently the existing airspace does not take advantage of modern navigational technology and the location of conventional ATS routes are constrained by the location of existing ground-based navigation aids. This limits the efficiency of the airspace.

6.1.3 Modern PBN takes advantage of "new" technology, removing the dependency of the route network on ground-based navigation aids facilitating optimised trajectories.

6.1.4 A PBN based design is expected to:

- Reduce the dependency on ground-based navigation aids
- Enable the distance between routes to be safely minimised (based on CAP1385 (Reference 11) requirements) due to improve track keeping conformance
- Allow the introduction of systemised routes which should reduce the amount of tactical intervention required, by optimising the routings available within a given piece of airspace
- Increase capacity
- Enable environmental benefits.

6.1.5 This airspace change is aligned with the SoN and AMS (Reference 10).

6.1.6 In addition to modernising the existing ATS network, this ACP endeavours to introduce new arrival and departure routes in and out of the ScTMA overhead the Firth of Forth. These routes should offer substantial benefits over existing connectivity including:

- Providing direct connectivity between FRA and the ScTMA for aircraft arriving and departing from/ to the east
- Reducing complexity in the south and southeast of the ScTMA, increasing efficiency and capacity
- Facilitating a reduction in land overflight below 7,000 ft for the Edinburgh Airport operation.

6.1.7 Route and waypoint names are subject to change and any referred to in this document set are working names only. Finalised route/waypoint names will be provided with the final ACP submission. This will follow any consultation led design updates.

6.2 Proposed Design

6.2.1 For a description of the design development see Annex E: Option Development.

6.2.2 The proposed ScTMA Airspace Design is divided into 2 distinct areas:

- ATS route network between the lower airspace and FRA (FL70 to FL255)
- ScTMA airport connectivity (above 7,000 ft), including holds, arrival routes and departure connectivity.

6.2.3 The second area is subdivided into three elements which:

- Provide connectivity to SID end points
- Provide connectivity to airport arrival structures
- Airport arrival structures, i.e. holds.

6.2.4 The proposed options to modify the ATS route network between the lower airspace and FRA (FL70 to FL255) as well as providing connectivity to SID end points can be considered collectively as these will both be addressed through the proposed ATS route structure. The majority of aircraft arriving and departing Edinburgh Airport (~80% based on 2023 planned departures) and Glasgow Airport (~67% based on 2023 planned departures) airports expect to use FRA. Within FRA, optimal routings based on carrier preference and SUA utilisation are available. Therefore, the proposed ATS route design will enable efficient entry and exit into/from FRA.

6.2.5 FRA arrival points are calculated using a 3° descent gradient between FRA and the hold whereas FRA departure points are calculated using a 7% climb profile from the runway end.

6.2.6 The proposed design has been reached through a combination of retaining existing routes, revising existing routes sections and introducing new routes, see Figure 22 and Table 22 below:

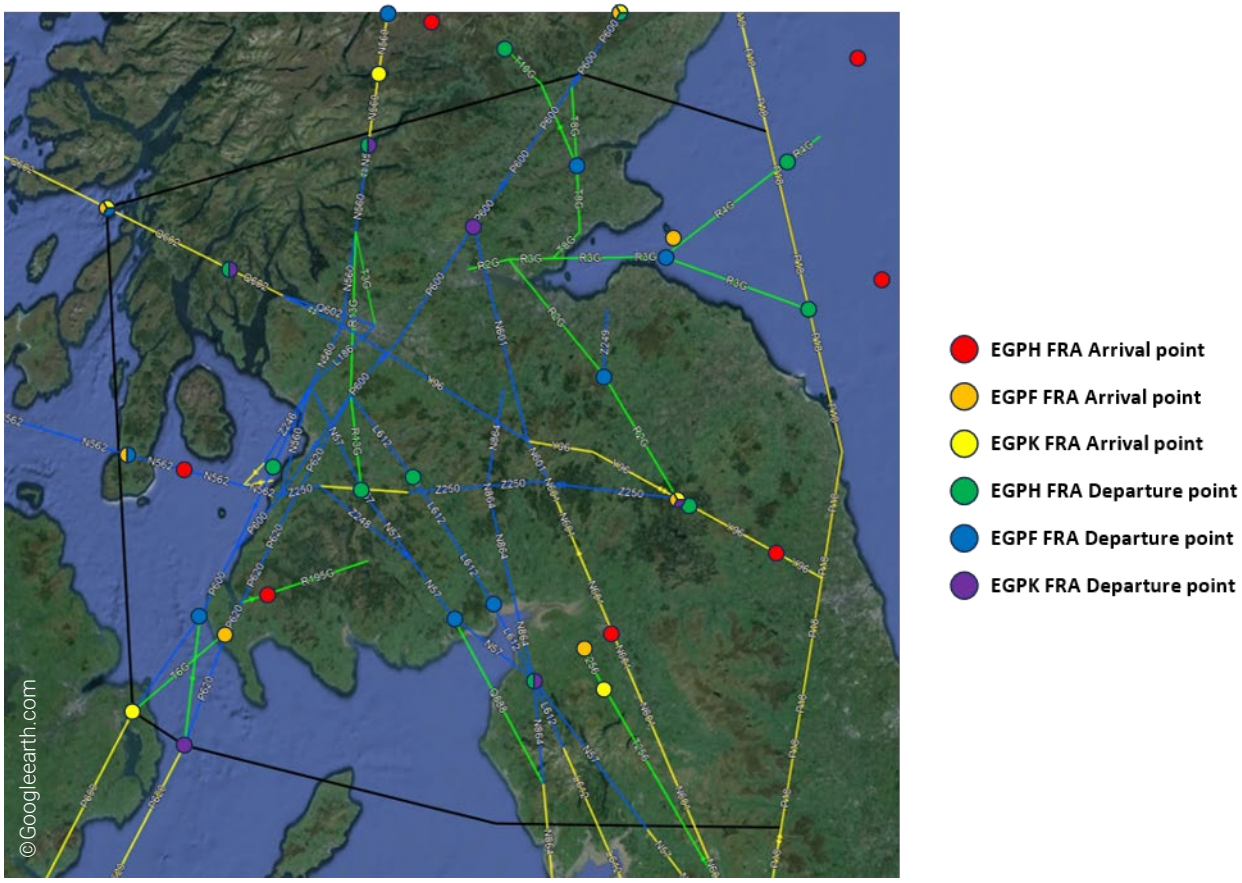


Figure 22: Proposed ATS route structure within the ScTMA. Retained existing routes are shown in yellow, modified route sections in blue and new routes in green.

6.2.7 The modelled SID routes, end points and levels as well as the location aircraft are expected to reach 7,000 ft are shown in Figure 23. [30] For full details of the proposed departure routes and to provide feedback to these departure routes below 7000 ft, please refer to the relevant airport ACP. A description of the SID design above 7,000 ft is included in Annex A: Edinburgh Airport Interface Procedures for Edinburgh airport and in Annex B: Glasgow Airport Interface Procedures for Glasgow Airport.

[30] The shown design includes Edinburgh Airports (Pre-FOA Option 1A&1C) and Glasgow Airports (Option 5) Standard Instrument Departures (SIDs) and arrival transitions. The presented fuel and CO_2e analysis was undertaken on this system wide pre-FOA design to inform the FOA analysis for the cluster. Following the FOA, the airports may update and proceed with a design that is different to the fully analysed design shown herein below 7,000 ft. However, consistent with the methodology described in the Masterplan, the airports' FOAs will be completed by comparing their designs to the analysed design to provide differences to the baseline.

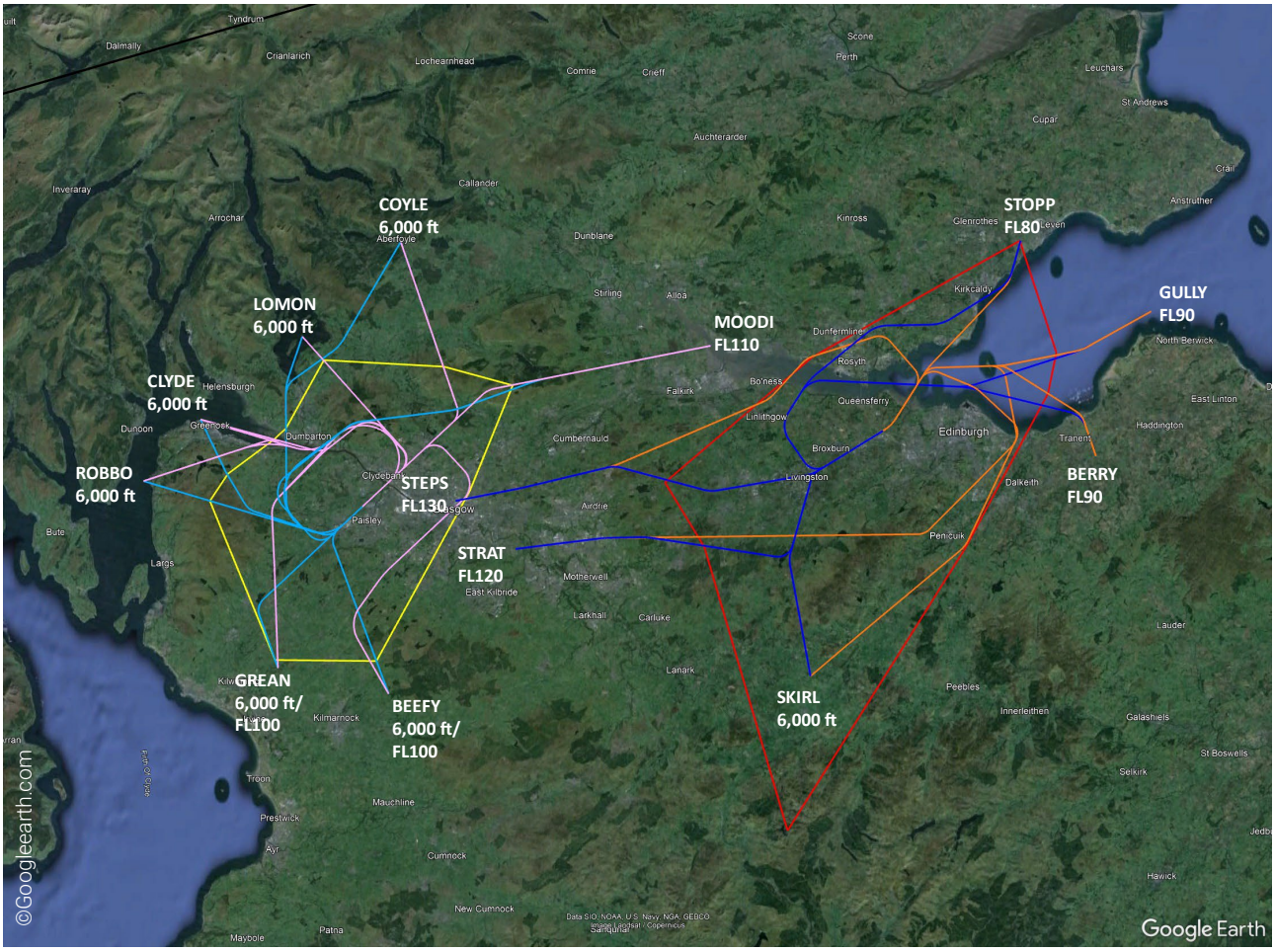


Figure 23: Proposed SID end levels, for the modelled design, where the airport departure procedures will join the ATS Network. Glasgow Airport SIDs are shown for westerly (light blue) and easterly (pink) operations and Edinburgh Airport SIDs are shown for westerly (dark blue) and easterly (orange) operations. The yellow box shows where Glasgow Airport expect their traffic to reach 7,000 ft and the red box shows where Edinburgh airport expect their traffic to reach 7,000 ft for departures.

6.2.8 The proposed design connects with the same orientation to the surrounding existing ATS route network within the adjacent airspace except for the "new" departure and arrival route to the east, the Firth of Forth. This new route should deliver substantial environmental benefits by providing new and improved connectivity to and from FRA to the east of the ScTMA.

6.2.9 Where able, consistent with the progressed Stage 2 options in the south, some common conflictions have been procedurally separated which should lead to a more efficient systemised network designed to keep aircraft safe with less ATC intervention.

6.2.10 ATS Route levels have been considered based on current aircraft performance and use. This has allowed superfluous CAS to be released through the raising of CAS bases.

6.2.11 Airspace classification has been reviewed and the classification of airspace has been selected to maximise access whilst maintaining a safe and efficient airspace environment.

6.2.12 The ATS route spacing is based on CAP1385 (Reference 11) route separation criteria assuming a 3 NM minimum radar spacing environment. This option is fully compliant with the CAA' s Policy for the Design of Controlled Airspace Structures (Reference 12) and Policy for the Establishment and Operation of Special Use Airspace (Reference 14). This option provides an efficient, deconflicted network which should yield safety, capacity and environmental benefits.

Benefits

- Greater access to and from FRA
- Enabling substantial environmental benefits through more efficient flight plan routes
- Predicted reduction in ATC complexity in key areas
- Predicted reduction in controller intervention
- New traffic offload scenarios to mitigate impact of SUA activity
- Provides a predictable network flow for Edinburgh and Glasgow arrivals and departures
- Reduced Class A airspace and improved airspace access for other airspace users.

Considerations

- Additional CAS may be required in some areas (mitigated by releasing CAS in other areas i.e. raising base levels or re-classification of airspace) in other areas
- Dependent on 3 NM without coordination being agreed
- At this stage it is assumed that FRA D3 will be implemented prior to this change. However, if this does not occur then connection to upper routes will be retained until such time as they are removed by FRA introduction.

6.2.13 The proposed ATS Route structure shall be contained within CAS.

6.2.14 Overall, the proposed change is expected to yield a positive impact on the operations of commercial airlines. The proposed changes should lead to increased route adherence and enable increased flexibility in flight planning. The introduction of a systemised design should lead to a reduction in ATC tactical intervention, resulting in the trajectories being flown correlating more closely to the flight plan with less delays. The proposed option should enable airlines to achieve a more continuous climb into FRA and improved descent profiles when arriving at the ScTMA airfields leading to reduced operating costs.

6.2.15 For geographic information relating to these routes see Figure 23 above. Table 17 below lists the ATS routes updated as part of this change, the CAS structures that contain the routes and a description of the use and impact of the change within the lateral limits of this change. Route names and waypoints are subject to be changed and any referred to in this document set are working names only. Finalised route names will be provided with the final ACP submission following any consultation led design updates.

ATS Route (New or Revised)	Associated CAS Structures	Use
L186 (Revised)	Strangford CTA14 ScTMA2 ScTMA3	L186 provides deconflicted connectivity for traffic departing Edinburgh Airport on the STEPS SID and Glasgow Airport on the GREAN SID to join P600 to the south. The route has been re-orientated to align with the wider network changes.
L612 (Revised north of ASCOM)	Borders CTA2 Borders CTA3 Yorkshire CTA4 Yorkshire CTA7 ScTMA1 ScTMA2	L612 provides connectivity to the south from P600 as well as traffic departing Glasgow Airport on a BEEFY departure. The northern portion has been realigned to link with the Glasgow Airport BEEFY SID.
N560 (Revised south of ERSON)	Moray CTA11 Moray CTA13 ScTMA2 ScTMA3 ScTMA4	N560 has been extended to TRN to provide more direct connectivity to TRN for Glasgow Prestwick Airport arrivals as well as providing additional connectivity between the southwestern corner of the ScTMA change and the north.
N562 (Revised between HERON and AMCON)	ARGYLL CTA3 ARGYLL CTA7 ScTMA2	N562 has had additional points added to minimise the additional CAS required through the lowering of this route connecting the ScTMA airspace to the west. The route has been lowered between HERON and MAC to ensure aircraft departing Prestwick remain within CAS improving safety.
N57 (Revised)	Borders CTA2 Borders CTA3 Strangford CTA14 Yorkshire CTA4 ScTMA2 ScTMA3	N57 provides connectivity to the south from N560 via R13G as well as traffic departing Glasgow Airport on a GREAN departure as well as traffic departing Glasgow Prestwick Airport. N57 has been realigned in the vicinity of the extant DCS and extended north towards Glasgow to provide this connectivity. DCS will be renamed
N601 (Revised north of IPDOR)	Borders CTA2 Borders CTA3 Yorkshire CTA4 ScTMA2 ScTMA3	N601 provides connectivity from the south of the ScTMA to the north. N601 has been realigned between IPDOR and GRICE following the TLA waypoint being replaced with EMBER. North of EMBER N601 is bidirectional. South of EMBER, N601 is unidirectional and the principle northbound route from the south into the ScTMA.
N864 (Revised north of SUBUK)	Borders CTA2 Borders CTA3 ScTMA2 ScTMA3	N864 provides connectivity from the ScTMA to the south. N601 has been realigned to EMBER and provides subsequent connectivity to the north via N560. Southbound traffic from Edinburgh Airport using a SKIRL SID will use N864.

ATS Route (New or Revised)	Associated CAS Structures	Use
P600 (Revised between ADN and GOTNA)	Strangford CTA2 Strangford CTA12 Strangford CTA14 Tay CTA1 Tay CTA6 Tay CTA7 Tay CTA8 ScTMA1 ScTMA2 ScTMA3	P600 transits the ScTMA airspace from the northeast (towards Aberdeen) down to the southwest (towards Ireland). It has been realigned to link with the airports SIDs and to introduce a systemised route structure (with P620) towards Irish airspace. North of TRN the route is bi-directional. South of TRN the route becomes southbound only. The change to the north of the lateral limits of this change is the introduction of a new FRA arrival point to facilitate arrivals into the ScTMA from FRA in the north.
P620 (Revised)	Strangford CTA11 Strangford CTA12 Strangford CTA14 ScTMA2	P620 provides a systemised arrival route into the ScTMA from the Irish airspace. It has been realigned to provide prolonged separation from aircraft departing the ScTMA via L186.
Q602 (Revised east of CLYDE)	Argyll CTA1 ScTMA3	Q602 provides connectivity to the northwest for traffic overflying the ScTMA via Y96 as well as traffic departing Edinburgh Airport on a STEPS departure and Glasgow Airport traffic on a CLYDE departure.
T10G (New)	Tay CTA2 Tay CTA4 Tay CTA6	T10G provides a link route for traffic departing Edinburgh Airport via a STOPP SID from T8G to FRA or to connect to P600.
T256 (Revised)	Borders CTA4 Yorkshire CTA3	T256 is a repurposed link route that provides connectivity to the ASLIB2G and SCARF1P STARS for low-level, non-FRA, aircraft arriving at Glasgow Airport and Glasgow Prestwick Airport respectively via RIBEL.
T3G (New)	ScTMA3	T3G is a link route that provides connectivity for aircraft departing Edinburgh Airport on a STEPS departure to the north via N560.
T5G (New)	Strangford CTA2 Strangford CTA11 Strangford CTA12	T5G is a crossover route to ensure aircraft departing the ScTMA change is correctly orientated for the Irish interface.
T6G (New)	Strangford CTA2 Strangford CTA12	T6G is a crossover route to ensure aircraft arriving at the ScTMA change is correctly orientated following the Irish interface.
T8G (New)	Tay CTA3 Tay CTA4 Tay CTA6 ScTMA3	T8G provides a link route for traffic departing Edinburgh Airport via a STOPP SID to FRA.

ATS Route (New or Revised)	Associated CAS Structures	Use
Y96 (Revised north of OTBUN)	Borders CTA6 Borders CTA7 ScTMA1 ScTMA2 ScTMA3	Y96 provides connectivity between the ScTMA and Newcastle (NATEB). Y96 also provides connectivity between the southeast (Newcastle area) and the north via N560 and the west/oceanic tracks via Q602.
Z246 (Revised north of DAUNT)	ScTMA2 ScTMA3	Z246 provides the existing connectivity to the west (N562) for aircraft departing Glasgow Prestwick Airport on a DAUNT departure. It has been extended to GREAN to provide N562 connectivity for Glasgow Airport aircraft on a GREAN departure.
Z247 (Retained)	ScTMA2	Z247 provides the existing connectivity to the west (N562) for aircraft departing Glasgow Prestwick Airport on a OKNOB departure.
Z248 (Revised)	Borders CTA2 ScTMA2	N/A
Z249 (Revised)	ScTMA2 ScTMA3	Z249 provides connectivity to the southeast using Y96 via R2G for traffic departing Edinburgh Airport on a BERRY departure.
Z250 (Revised)	Borders CTA2 Borders CTA6 Borders CTA7 ScTMA2	Z250 has been realigned to provide more direct connectivity between Y96 and TRN.
R13G (New)	ScTMA1 ScTMA2 ScTMA3	R13G is a proposed new low level overflight route for southbound traffic from N560 to connect with the southbound routes, L612 and N57.
R195G (New)	Strangford CTA12 Strangford CTA13	R195G is a proposed new route to provide connectivity for traffic arriving from the Irish interface to RANRA1E STAR for Edinburgh Airport.
R2G (New)	Borders CTA6 Borders CTA7 ScTMA2 ScTMA3	R2G is a proposed new route to provide connectivity for traffic departing Glasgow Airport on a MOODI departure and Edinburgh Airport on a BERRY departure to the southeast via Y96.
R3G (New)	Borders CTA12 Tay CTA14 Tay CTA15 ScTMA3 ScTMA5	R3G is a proposed new route to provide the southern departure connectivity for aircraft departing Glasgow Airport on a GULLY departure than R2G or Edinburgh Airport aircraft departing on a GULLY departure. This route will provide connectivity to FRA only.
R4G (New)	Tay CTA 13 Tay CTA14 Tay CTA15	R4G is a proposed new route that branches of R3G to provide the northern departure connectivity. This route will provide connectivity to FRA only.
Q888	Borders CTA 1 Borders CTA 3	Q888 is a proposed link route above FL195 for aircraft southbound from the ScTMA connecting N57 to N864

Table 17: ATS routes proposed to be updated as part of this change and the airspace blocks that contain the route.

STARs

Edinburgh Airport STARs

6.2.16 Aircraft arriving at Edinburgh Airport will do so using an IFP known as a STAR. The existing STARs require updating due to the route network and low-level airport changes updates. All STARs are designed to RNAV 1 or better, consistent with the UK exceptions to the PBN Implementing Rule (PBN-IR) 2018/1048. Proposed STARs have been designed from the IAF backwards to ensure a CDO, based on a calculated 3° descent profile, from the start of the STAR is achieved. Following the STAR, the aircraft will plan to follow an IFP known as an arrival transition. The arrival transitions are part of the corresponding airport ACP. However, the portion of the arrival transition where aircraft are expected to be at and above 7,000 ft is included in Annex A: Edinburgh Airport Interface Procedures. Interactions between arrival transitions and other procedures were identified during the CAF part 1 work and are described within Appendix 3 of the masterplan iteration 3- Scotland. The resolution of these interactions is described within The CAF part 2 which is included here. As part of the resolution, the STARs include levels (by, below and or above) to ensure procedures remain safely separated from one and another. For full details of the Edinburgh Airport arrival transitions see the Edinburgh ACP. The existing and proposed STARs serving Edinburgh Airport are shown in Figure 24 below and described in Annex A: Edinburgh Airport Interface Procedures :

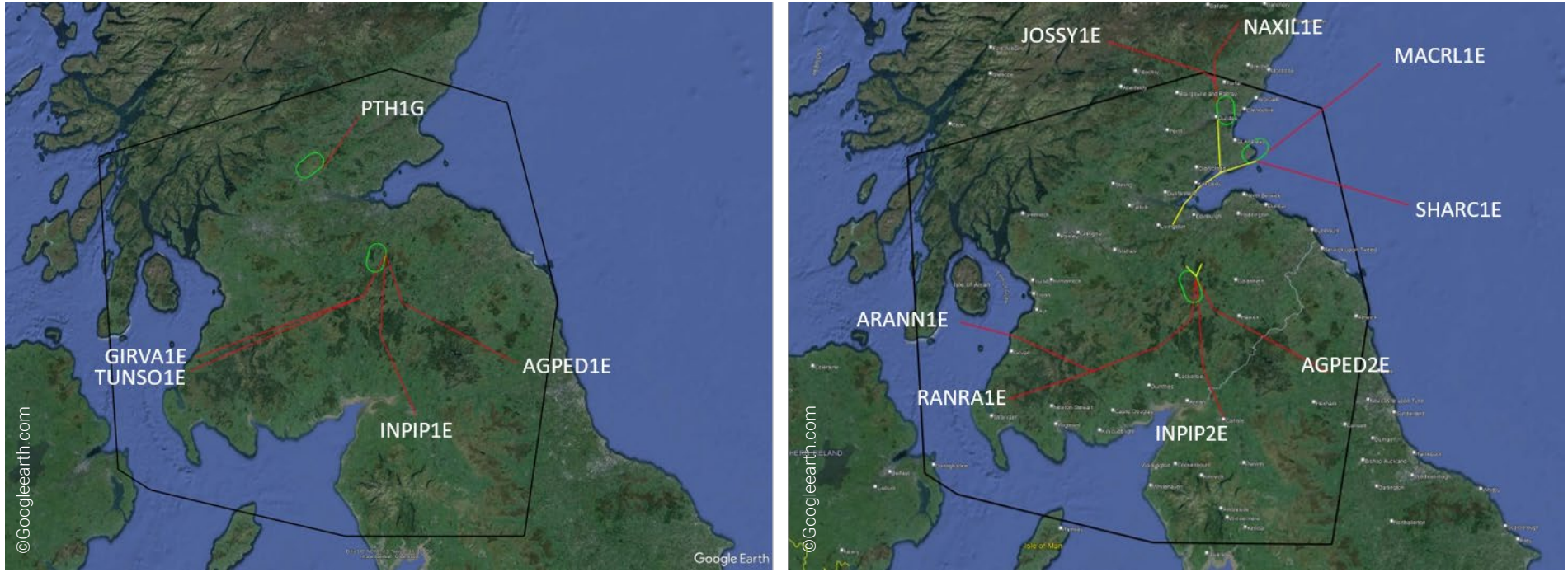


Figure 24: Existing STARs serving Edinburgh Airport (left image) and proposed STARs serving Edinburgh Airport (right image). The arrival transitions above 7,000 ft are shown in yellow.

Glasgow Airport STARs

6.2.17 Aircraft arriving at Glasgow Airport will do so using an IFP known as a STAR. The existing STARS requiring updating due to the route network and low-level airport changes updates. Proposed STARS have been designed from the IAF backwards to ensure a CDO operation, based on a calculated 3° descent profile, from the start of the STAR is achieved. Following the STAR, the aircraft will plan to follow an IFP known as an arrival transition. The arrival transitions are part of the corresponding airport ACP. However, the portion of the arrival transition where aircraft are expected to be at and above 7,000 ft is included in Annex B: Glasgow Airport Interface Procedures. Interactions between arrival transitions and other procedures were identified during the CAF part 1 work and are described within Appendix 3 of the masterplan iteration 3- Scotland. The resolution of these interactions is described within The CAF part 2 which is included here. As part of the resolution, the STARs include levels (by, below and or above) to ensure procedures remain safely separated from one and another. For details of the Glasgow Airport's arrival transitions see the Glasgow ACP. The existing and proposed STARs serving Glasgow Airport are shown in Figure 25 below and described in Annex B: Glasgow Airport Interface Procedures.

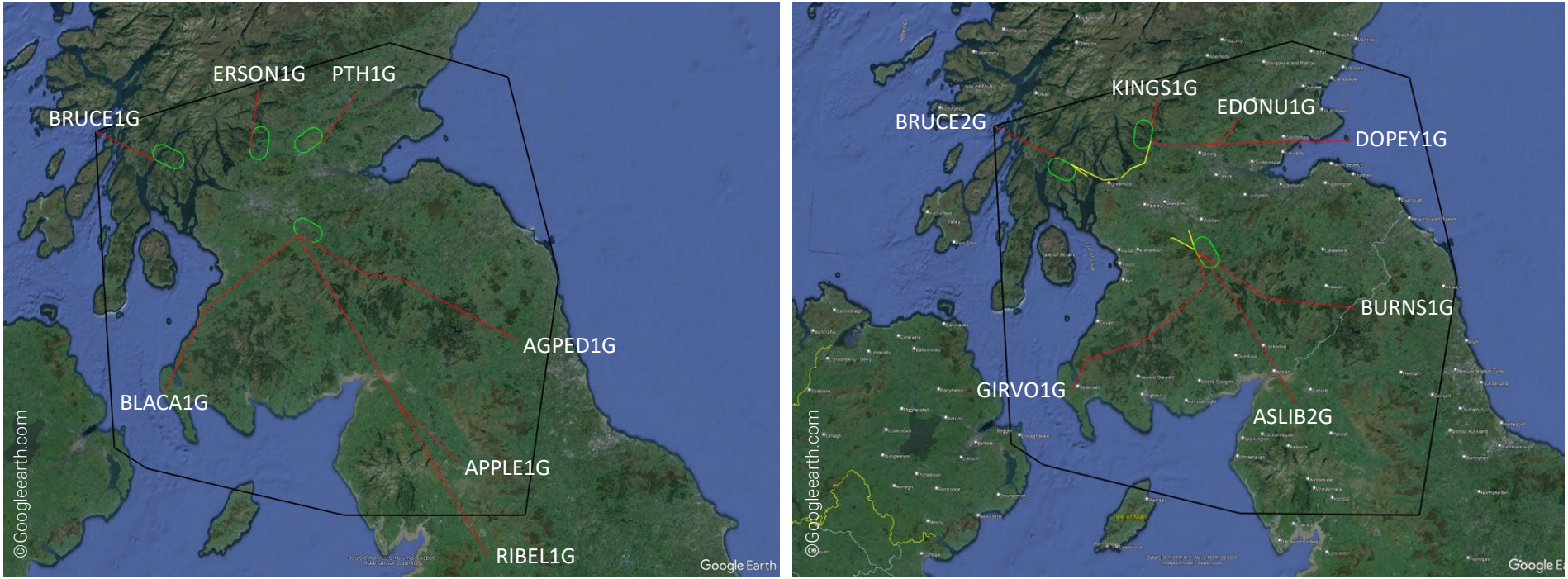


Figure 25: Existing STARs serving Glasgow Airport (left image) and proposed STARs serving Glasgow Airport (right image). The arrival transitions above 7,000 ft are shown in yellow.

Glasgow Prestwick Airport STARs

6.2.18 Aircraft arriving at Glasgow Prestwick Airport will do so using an IFP known as a STAR. The existing STARs require updating due to the proposed route network changes causing a disconnect between the initial STAR fix and the network. The STARs have been designed to ensure there are no changes to tracks below 7,000 ft because of this proposed update. These changes are included herein and will not require an additional ACP submission by Glasgow Prestwick. The existing and proposed STARs serving Glasgow Prestwick Airport are shown in Figure 26 below and described Annex C: Glasgow Prestwick Airport Interface Procedures in Table 1 below:

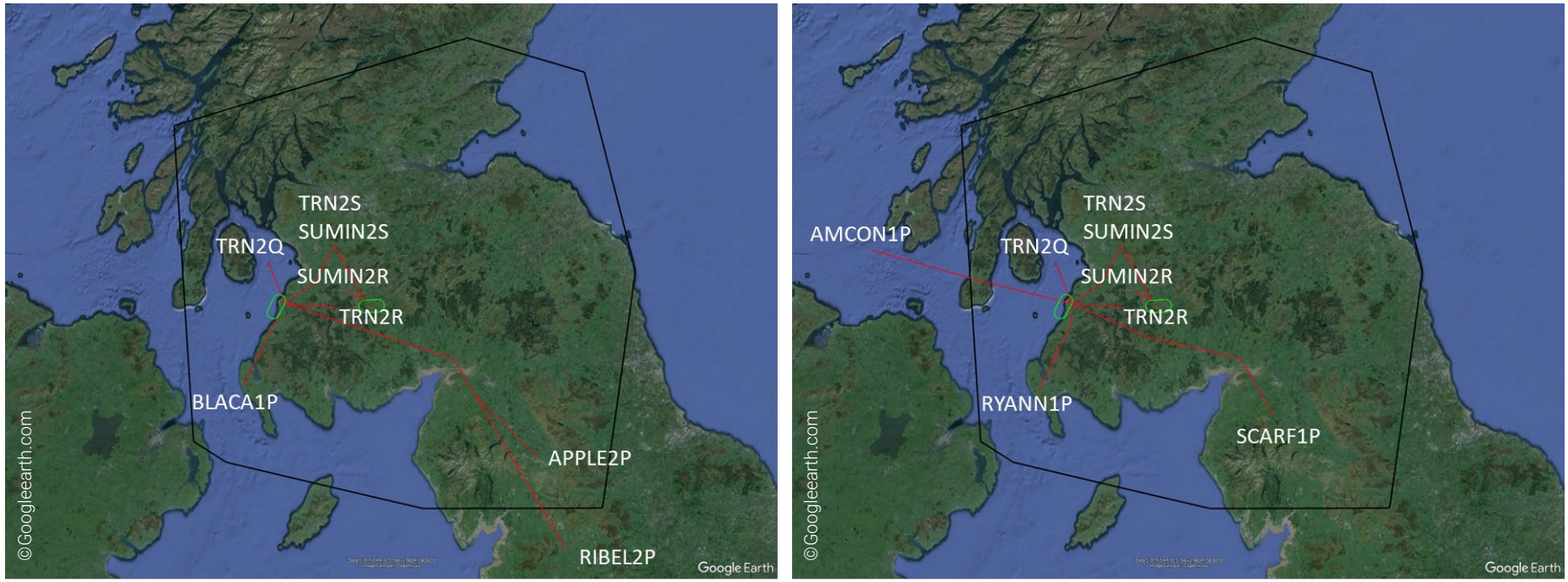


Figure 26: Existing STARs serving Glasgow Prestwick Airport (left image) and proposed STARs serving Glasgow Prestwick Airport (right image).

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Holds

6.2.19 CAP785B- Implementation and Safeguarding of Instrument Flight Procedures (IFPs) (Reference 16) in the UK stipulates that 'All STARs are required to terminate with a hold.' Edinburgh Airport and Glasgow Airport will be responsible for clearing aircraft from the hold, therefore it is a requirement that holds are situated within the operating range of their radar feed. For the airports, this constraint is 40 NM. Additionally, it is desirable that the expected track of aircraft holding remain within this threshold to ensure an accurate radar picture is held by the airfields ATCOs.

6.2.20 The redesign of the ScTMA holds is forecast to reduce total holding in 2027 from 150,500 minutes to 114,971 minutes and in 2036 from 226,886 to 176,051 minutes. The number of total aircraft holding is forecast to reduce from 39,685 to 32,550 in 2027 and from 51,037 to 43,851 in 2036.

6.2.21 This represents an improvement in the efficiency of the system wide ScTMA airspace design which should deliver environmental (reduced noise and emissions) and capacity benefits.

Shared Hold- STIRA

6.2.22 The shared STIRA hold is proposed to be removed from the ScTMA design. The removal of this shared hold from the design would remove the inherent complexity due to the requirement of ATC to manage aircraft arriving at more than one airfield via a single hold as well as allowing aircraft arriving at Glasgow Airport to remain higher for longer and reduce the interaction between arriving and departing aircraft to the north of the ScTMA.

6.2.23 Aircraft arriving at Edinburgh Airport that would have used the STIRA hold would now be held, if needed, at the proposed STOBS hold. This hold is further away from the airfield and subsequently aircraft can be held at higher levels. This will reduce the environmental (noise, and emissions) impact for these arrivals if they are required to hold.

6.2.24 Aircraft arriving at Glasgow Airport are proposed to be kept higher for longer and re-routed to the revised COYLE hold, if needed. This will deliver environmental benefits through improved flight efficiency resulting from the aircraft remaining higher as well as the additional benefits enabled on other procedures/routes by freeing up the airspace in the vicinity of the extant STIRA hold to enable improved departure profiles and improving access to GA.

Edinburgh Airport Holds- STOBS

Figure 27: Location of proposed STOBS hold (green line) and associated STARs (red lines) and arrival transition above 7, 000 ft (yellow line).

6.2.25 Aircraft arriving at Edinburgh Airport using the proposed NAXIL 1E or JOSSY 1E STARs will either be cleared direct onto the arrival transition or required to hold to absorb delay and to facilitate the correct arrival spacing for aircraft. If aircraft are required to hold, this will be done using the proposed STOBS hold.

6.2.26 The STOBS hold will replace the existing STIRA hold and will serve aircraft arriving at Edinburgh Airport from the ATS route network and FRA in the north. It is proposed to be located approximately 33 NM north-northeast of Edinburgh Airport in the vicinity of Dundee.

6.2.27 The highest terrain in the region of STOBS hold overflight is Dundee Law (571 ft). The STOBS hold does not overfly any NSAs, National Parks or National Landscapes.

6.2.28 STOBS hold is required to facilitate holding for traffic from the north, especially when D514 is active. The activation of D514 will make holding at WORM2 (paragraphs 6.2.33 to 6.2.42) no longer available.

6.2.29 The holding impact forecast for the STIRA and STOBS hold in 2027 and 2036 are shown below in Table 18.

	STIRA (2027)	STIRA (2036)	STOBS (2027)	STOBS (2036)
Holding Fix Location	560802.11N 0035000.98W		562744.9633N 0025621.8256W	
Inbound track	232.2		176.9	
Direction of PTN	Right		Left	
Speed (kts)	230		230	
Outbound Leg	4 NM		3.5NM	
Levels	FL70 – FL140		FL110 – FL140	
Highest Terrain (overflight agl)	2,366 ft (5634 ft)		571 ft (10,429 ft)	
Total Aircraft Holding	1811	2930	957	1365
Average Daily holding	~ 5	~8	<3	~4
Average Hold duration	5 min 6 s	5 min 36 s	3 min 30 s	4 min 0 s
Population overflown by hold	41,973		Not calculated due to planned holding occurring substantially above 7,000 ft agl.	
Highest population elevation	873 ft			

Table 18: Impact comparison between extant STIRA and proposed STOBS hold.

6.2.30 The introduction of the STOBS hold is forecast to reduce the average number of aircraft holding from ~5 to ~3 per day in 2027, and from ~8 to ~4 in 2036. The average holding time is forecast to fall by 1 min 36 s in 2027 and 2036. This will deliver environmental benefits through reduced fuel burn/CO_2e emissions as well as reducing the frequency of population overflight.

6.2.31 The STOBS hold is proposed to operate between FL110 and FL140 and will be ~10,400 ft agl. Therefore, in line with DfT guidance (Reference 13), no noise analysis is required.

6.2.32 Following the hold, aircraft will be cleared to fly one of two arrival transitions that are dependent on the runway in use. This procedure will provide a lateral track to the airfield and includes planned levels within the procedure to ensure aircraft remain procedurally separated from other aircraft within the vicinity flying other procedures. All interactions between adjacent procedures are described in Annex 3 of the Masterplan Iteration 3- Scotland (Reference 19) and in the CAF 2 work described in here. This published procedure is included within the airport's submission. The lateral track of the procedure until the aircraft are expected to be at 7,000 ft is shown in Figure 27. Actual descent will be issued by ATC.

6.2.33 The CAA's Manual of Air Traffic Service (reference CAP493, link) is the standard instruction book for every provider of ATS in the UK. Section 1 Chapter 1 stipulates that one of the objectives of an ATS is to expedite and maintain an orderly flow of air traffic. Consistent with this objective, NERL and airport ATCOs may issue tactical shortcuts by vectoring aircraft away from the published procedures to expedite the flow of traffic as opportunities present themselves to deliver environmental benefits in addition to those described in this Consultation Document.

Edinburgh Airport Holds- WORM2

Figure 28: Location of proposed WORM2 hold (green line) and associated STARs (red lines) and arrival transition above 7, 000 ft (yellow line).

6.2.34 Aircraft arriving at Edinburgh Airport using the proposed MACRL 1E or SHARC 1E STARs will either be cleared direct onto the arrival transition or required to hold to absorb delay and to facilitate the correct arrival spacing for aircraft. If aircraft are required to hold, this will be done using the proposed WORM2 hold.

6.2.35 The WORM2 hold is a new hold that will serve aircraft arriving at Edinburgh Airport via the new Firth of Forth connectivity. This hold will be used by some traffic which would have previously held at STIRA and or TARTN. It is proposed to be located approximately 30 NM northeast of Edinburgh Airport in the vicinity of Crail.

6.2.36 The WORM2 does not overfly any significant terrain or any NSAs, National Parks or National Landscapes.

6.2.37 When D514 is active, WORM2 hold will no longer be available. Traffic will be diverted to the STOBS hold (see 6.2.24 to 6.2.32).

6.2.38 The holding impact forecast for the WORM2 hold in 2027 and 2036 are shown below in Table 19.

	WORM2 (2027)	WORM2 (2036)
Holding Fix Location	561344.0600N 0023500.2500W	
Inbound track	233.0	
Direction of PTN	Right	
Speed (kts)	230	
Outbound Leg	3.5 NM	
Levels	FL100 – FL140	
Highest Terrain (overflight agl)	No significant terrain above 500 ft	
Total Aircraft Holding	2290	3785
Average Daily holding	~6	~10
Average Hold duration	3 min 42 s	4 min 24 s
Population overflown by hold	Not calculated due to planned holding occurring substantially above 7,000 ft agl.	
Highest population elevation		

Table 19: Impact assessment for proposed WORM2 hold.

6.2.39 The introduction of the WORM2 hold facilitates a reduction in holding within the ScTMA by redistributing arrival routes away from the busy southern portion of the ScTMA. The location is predominantly over the sea, greatly reducing the population overflown by holding aircraft.

6.2.40 The enabled increase in efficiency for the ScTMA should deliver environmental benefits through reduced fuel burn/CO_2e emissions as well as reducing the frequency of population overflight by holding aircraft.

6.2.41 The WORM2 hold is proposed to operate between FL100 and FL140. Therefore, in line with DfT guidance (Reference 13), no noise analysis is required.

6.2.42 Following the hold, aircraft will be cleared to fly one of two arrival transitions (transition tracks are coincident above 7,000 ft) that are dependent on the runway in use. This procedure will provide a lateral track to the airfield and includes planned levels within the procedure to ensure aircraft remain procedurally separated from other aircraft within the vicinity flying other procedures. All interactions between adjacent procedures are described in Annex 3 of the Masterplan Iteration 3- Scotland (Reference 19) and in the CAF 2 work included here. This published procedure is included within the airport's submission. The lateral track of the procedure until the aircraft are expected to be at 7,000 ft is shown in Figure 28. Actual descent will be issued by ATC.

6.2.43 The CAA's Manual of Air Traffic Service (reference CAP493, link) is the standard instruction book for every provider of ATS in the UK. Section 1 Chapter 1 stipulates that one of the objectives of an ATS is to expedite and maintain an orderly flow of air traffic. Consistent with this objective, NERL and airport ATCOs may issue tactical shortcuts by vectoring aircraft away from the published procedures to expedite the flow of traffic as opportunities present themselves to deliver environmental benefits in addition to those described in this Consultation Document.

Edinburgh Airport Holds- TART3

Figure 29: Location of proposed TART3 hold (green line) and associated STARs (red lines) and arrival transition above 7, 000 ft (yellow lines).

6.2.44 Aircraft arriving at Edinburgh Airport using the proposed ARANN 1E, RANRA 1E, INPIP 2E or AGPED 2E STARs will either be cleared direct onto the arrival transition or required to hold to absorb delay and to facilitate the correct arrival spacing for aircraft. If aircraft are required to hold, this will be done using the proposed TART3 hold.

6.2.45 The TART3 hold will replace the existing TARTN hold and will serve aircraft arriving at Edinburgh Airport from the south. It is proposed to be located approximately 20 NM south of Edinburgh Airport in the vicinity of Peebles. The TART3 hold is 5 NM south of the extant TARTN hold and has rotated 53.5° counterclockwise.

6.2.46 The highest terrain in the region of TART3 hold overflight is Dun Rig (2,435 ft). The TART3 hold overflies 50.4 km^2, an increase of 7.2 km^2, of the Upper Tweeddale.

6.2.47 The holding impact forecast for the TARTN and TART3 hold in 2027 and 2036 are shown below in Table 20.

	TARTN (2027)	TARTN (2036)	TART3 (2027)	TART3 (2036)
Holding Fix Location	554301.89N 0030818.73W		553800.1095N 0030910.9298W	
Inbound track	013.5		340	
Direction of PTN	Left		Left	
Speed (kts)	230		230	
Outbound Leg	3.5 NM		1 min	
Levels	FL70 – FL140		FL100 – FL140	
Highest Terrain (overflight agl)	1,975 ft (5,025 ft)		2,435 ft (7,565 ft)	
Total Aircraft Holding	25,212	33,832	20,803	29,859
Average Daily holding	~ 69	~93	~57	~82
Average Hold duration	3 min 30 s	4 min 18 s	3 min 36 s	4 min 12 s
Population overflown by hold	10,239		9,648 (153 new)	
Highest population elevation	1,066 ft		1,017 ft	
National Landscape/National Park/ NSA area overflown	43.0 km^2		50.4 km^2	

Table 20: Impact comparison between extant TARTN and proposed TART3 hold.

6.2.48 The introduction of the TART3 hold is forecast to reduce the average number of aircraft holding from ~69 to ~57 per day in 2027, and from ~93 to ~82 in 2036. The average holding time is forecast to increase by 6 s in 2027 and reduce by 6 s 2036. Total holding time for these arrival routes is expected to fall by 13,233 mins p.a in 2027 (15%) and 18,793 mins p.a. in 2036 (13%) representing a reduction in the frequency of overflight in this region.

6.2.49 The reduction in aircraft holding is partly due to aircraft flight planning to arrive via the Firth of Forth routes and holding elsewhere in the ScTMA and partly through an increased efficiency in the design reducing holding within the ScTMA airspace.

6.2.50 The TART3 hold is proposed to operate between FL100 and FL140, a raise in altitude of 3,000 ft, increasing the aircraft height whilst in the hold to >7,000 ft, further decreasing the environmental impact. Therefore, in line with DfT guidance (Reference 13), no noise analysis is required.

6.2.51 Following the hold, aircraft will be cleared to fly one of two arrival transitions that are dependent on the runway in use. This procedure will provide a lateral track to the airfield and includes planned levels within the procedure to ensure aircraft remain procedurally separated from other aircraft within the vicinity flying other procedures. All interactions between adjacent procedures are described in Annex 3 of the Masterplan Iteration 3- Scotland (Reference 19) and in the CAF 2 work described here. This published procedure is included within the airport's submission. The lateral track of the procedure until the aircraft are expected to be at 7,000 ft is shown in Figure 29. Actual descent will be issued by ATC.

6.2.52 The CAA's Manual of Air Traffic Service (reference CAP493, link) is the standard instruction book for every provider of ATS in the UK. Section 1 Chapter 1 stipulates that one of the objectives of an ATS is to expedite and maintain an orderly flow of air traffic. Consistent with this objective, NERL and airport ATCOs may issue tactical shortcuts by vectoring aircraft away from the published procedures to expedite the flow of traffic as opportunities present themselves to deliver environmental benefits in addition to those described in this Consultation Document.

Glasgow Airport Holds- FYNER

Figure 30: Location of proposed FYNER hold (green line) and associated STARs (red line) and arrival transition above 7, 000 ft (yellow lines).

6.2.53 Aircraft arriving at Glasgow Airport using the proposed BRUCE 2G STAR will either be cleared direct onto the arrival transition or required to hold to absorb delay and to facilitate the correct arrival spacing for aircraft. If aircraft are required to hold, this will be done using the proposed FYNER hold.

6.2.54 The FYNER hold will serve aircraft arriving at Glasgow Airport from the northwest. It uses the same holding fix as the existing FYNER hold but has changed from a left hand to a right-hand pattern, therefore the name does not require updating. The change in direction reduces the population and National Parks/National Scenic Areas overflown, reducing the impact to ground-based stakeholders. It is located approximately 25 NM northwest of Glasgow Airport, overhead and east of Loch Fyne.

6.2.55 The highest terrain in the region of FYNER hold overflight is Sgorach Mor (1972 ft). The FYNER hold overflies 17.3 km^2, a reduction of 39.2 km^2, of the Kyles of Bute, and Loch Lomond and the Trossachs National Park.

6.2.56 The holding impact forecast for the extant and proposed FYNER holds in 2027 and 2036 are shown below in Table 21.

	Extant FYNER (2027)	Extant FYNER (2036)	Proposed FYNER (2027)	Proposed FYNER (2036)
Holding Fix Location	560256.12N 0050655.19W			
Inbound track	115.7			
Direction of PTN	Left		Right	
Speed (kts)	230			
Outbound Leg	1 min			
Levels	FL70 – FL140		FL90 – FL140	
Highest Terrain (overflight agl)	2,432 ft (4,568 ft)		1,972 ft (7,028 ft)	
Total Aircraft Holding	1344	1787	269	447
Average Daily holding	~4	~5	~1	~1
Average Hold duration	4 min 30 s	4 min 54 s	3 min 12 s	3 min 42 s
Population overflown by hold	655		304 (265 new)	
Highest population elevation	300 ft		314 ft	
National Landscape/National Park/ NSA area overflown	51.2 km^2		17.3 km^2	

Table 21: Impact comparison between extant FYNER and proposed FYNER hold.

6.2.57 The amendments to the FYNER hold is forecast to reduce the average number of aircraft holding from ~4 to ~1 per day in 2027, and from ~5 to ~1 in 2036. The average holding time is forecast to reduce by 1 min 18 s in 2027 and by 1 min 12 s 2036.

6.2.58 The enabled increase in efficiency for the ScTMA should deliver environmental benefits through reduced fuel burn/CO_2e emissions as well as reducing the frequency of population overflight by holding aircraft.

6.2.59 The reduction in the number of aircraft holding to the north of the ScTMA is attributable to improved efficiency in the lower airspace.

6.2.60 The FYNER hold is proposed to operate between FL90 and FL140, a raise in altitude of 2,000 ft, increasing the aircraft height whilst in the hold to >7,000 ft. Therefore, in line with DfT guidance (Reference 13), no noise analysis is required.

6.2.61 Following the hold, aircraft will be cleared to fly one of two arrival transitions that are dependent on the runway in use. This procedure will provide a lateral track to the airfield and includes planned levels within the procedure to ensure aircraft remain procedurally separated from other aircraft within the vicinity flying other procedures. All interactions between adjacent procedures are described in Annex 3 of the Masterplan Iteration 3- Scotland (Reference 19) and in the CAF 2 work described here. This published procedure is included within the airport's submission. The lateral track of the procedure until the aircraft are expected to be at 7,000 ft is shown in Figure 30. Actual descent will be issued by ATC.

6.2.62 The CAA's Manual of Air Traffic Service (reference CAP493, link) is the standard instruction book for every provider of ATS in the UK. Section 1 Chapter 1 stipulates that one of the objectives of an ATS is to expedite and maintain an orderly flow of air traffic. Consistent with this objective, NERL and airport ATCOs may issue tactical shortcuts by vectoring aircraft away from the published procedures to expedite the flow of traffic as opportunities present themselves to deliver environmental benefits in addition to those described in this Consultation Document.

Glasgow Airport Holds- COYLE

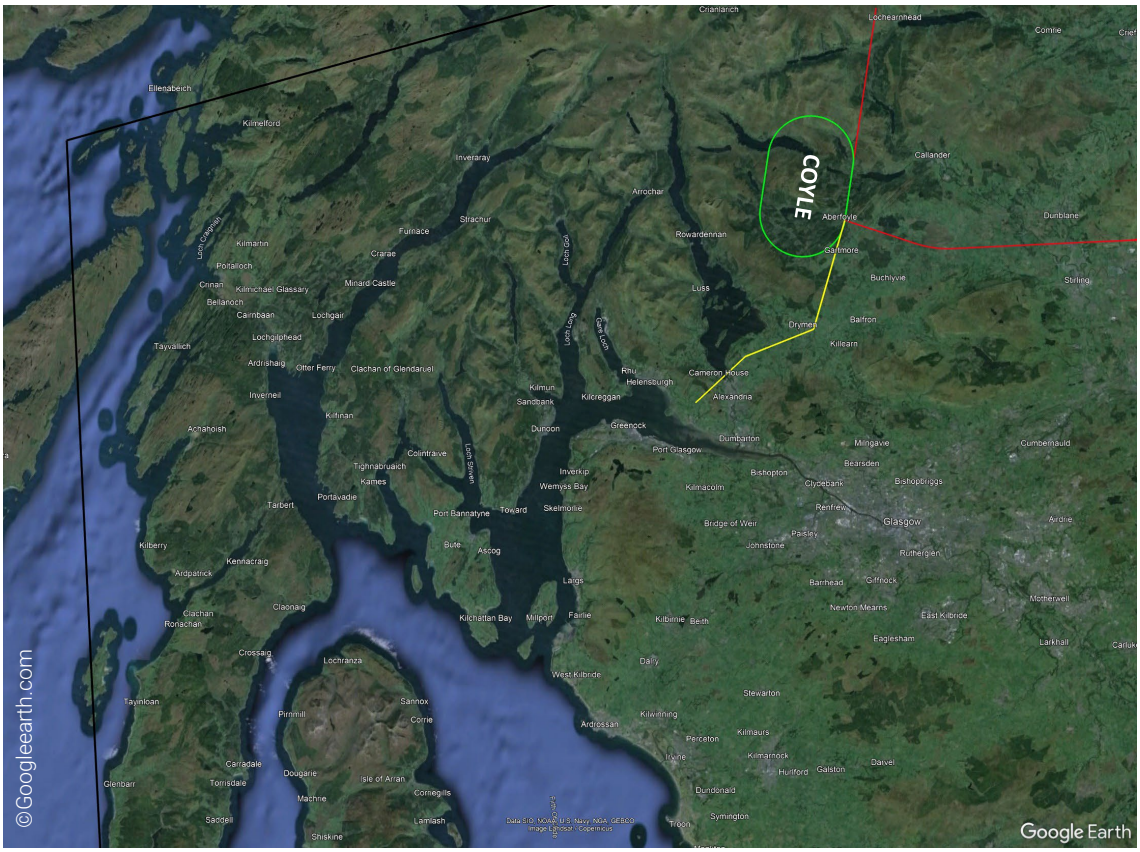

Figure 31: Location of proposed COYLE hold (green line) and associated STARs (red lines) and arrival transition above 7, 000 ft (yellow line).

6.2.63 Aircraft arriving at Glasgow Airport using the proposed KINGS 1G, EDONU 1G or DOPEY 1G STARs will either be cleared direct onto the arrival transition or required to hold to absorb delay and to facilitate the correct arrival spacing for aircraft. If aircraft are required to hold, this will be done using the proposed COYLE hold.

6.2.64 The COYLE hold will serve aircraft arriving at Glasgow Airport from the north, northeast and east. It is 2 NM further north than the extant FOYLE hold and overflies a similar region. It is located approximately 18 NM north of Glasgow Airport, in the vicinity of Aberfoyle.

6.2.65 The highest terrain in the region of COYLE hold overflight is Benvane (2,694 ft). The COYLE hold overflies 201.8 km^2, an increase of 80.0 km^2, of the Loch Lomond and the Trossachs National Park.

6.2.66 The holding impact forecast for the FOYLE and COYLE holds in 2027 and 2036 are shown below in Table 22.

	FOYLE (2027)	FOYLE (2036)	COYLE (2027)	COYLE (2036)
Holding Fix Location	560834.13N 0042256.41W		561031.3900N 0042228.8900W	
Inbound track	187.5		187.52	
Direction of PTN	Left		Right	
Speed (kts)	230		230	
Outbound Leg	1 min		3.5 NM	
Levels	FL70 – FL140		FL70 – FL140	
Highest Terrain (overflight agl)	2,884 ft (4,116 ft)		2,694 ft (4,306 ft)	
Total Aircraft Holding	292	434	666	776
Average Daily holding	~1	~1	~2	~2
Average Hold duration	4 min 6 s	3 min 42 s	4 min 12 s	3 min 42 s
Population overflown by hold	2,971		1,600 (352 new)	
Highest population elevation	695 ft		689 ft	
National Landscape/National Park/NSA area overflown	121.8 km^2		201.8 km^2	

Table 22: Impact comparison between extant FOYLE and proposed COYLE hold.

6.2.67 The number of aircraft holding to the north of the ScTMA is expected to increase as traffic increases. Traffic is not redistributed away from the extant FOYLE hold and therefore part of this increase in holding is consistent with forecast growth. In addition to the aircraft currently arriving via FOYLE, the proposed COYLE hold will be used by Glasgow Airport arrivals via the Firth of Forth (DOPEY 1G) as well as arrivals from the west (EDONU 1G) via FRA and P600.

6.2.68 The forecast change in holding duration between the baseline holding and the option holding is considered negligible in the year of implementation. Holding time is expected to decrease 10 years post implementation as traffic increases due to the improved efficiency of the low-level airspace although frequency of holding is expected to remain low.

6.2.69 The redistribution of traffic that previously would have held at STIRA and LANAK to the proposed COYLE hold, whilst appearing to lead to an increase in holding time, it is actually contributing to the net improvement in holding within the ScTMA.

6.2.70 The COYLE hold is proposed to operate between FL70 and FL140. However, it is unlikely that all of the new traffic routing via the COYLE hold will require holding.

6.2.71 The most common aircraft using this hold is expected to be a 125-180 seat single-aisle 2-engine jet. The Lmax for this category of aircraft when arriving between 4,000 – 5,000 ft is 61-59 dB, equivalent to a "busy office." There are too few flights to show on LAeq16h contour. Overhead the highest population (FK83SY) aircraft are expected to be in excess of 6,000 ft agl and will have an Lmax of 57-56 dB, equivalent to a quiet office. Due to the expected low incidence of holding and overflight, NERL does not consider it proportional to provide a full noise analysis for aircraft in this hold.

6.2.72 Following the hold, aircraft will be cleared to fly one of two arrival transitions that are dependent on the runway in use. This procedure will provide a lateral track to the airfield and includes planned levels within the procedure to ensure aircraft remain procedurally separated from other aircraft within the vicinity flying other procedures. All interactions between adjacent procedures are described in Annex 3 of the Masterplan Iteration 3- Scotland (Reference 19) and in the CAF 2 work described here. This published procedure is included within the airport's submission. The

lateral track of the procedure until the aircraft are expected to be at 7,000 ft is shown in Figure 31. Actual descent will be issued by ATC.

6.2.73 The CAA's Manual of Air Traffic Service (reference CAP493, link) is the standard instruction book for every provider of ATS in the UK. Section 1 Chapter 1 stipulates that one of the objectives of an ATS is to expedite and maintain an orderly flow of air traffic. Consistent with this objective, NERL and airport ATCOs may issue tactical shortcuts by vectoring aircraft away from the published procedures to expedite the flow of traffic as opportunities present themselves to deliver environmental benefits in addition to those described herein.

Glasgow Airport Holds- LESMA

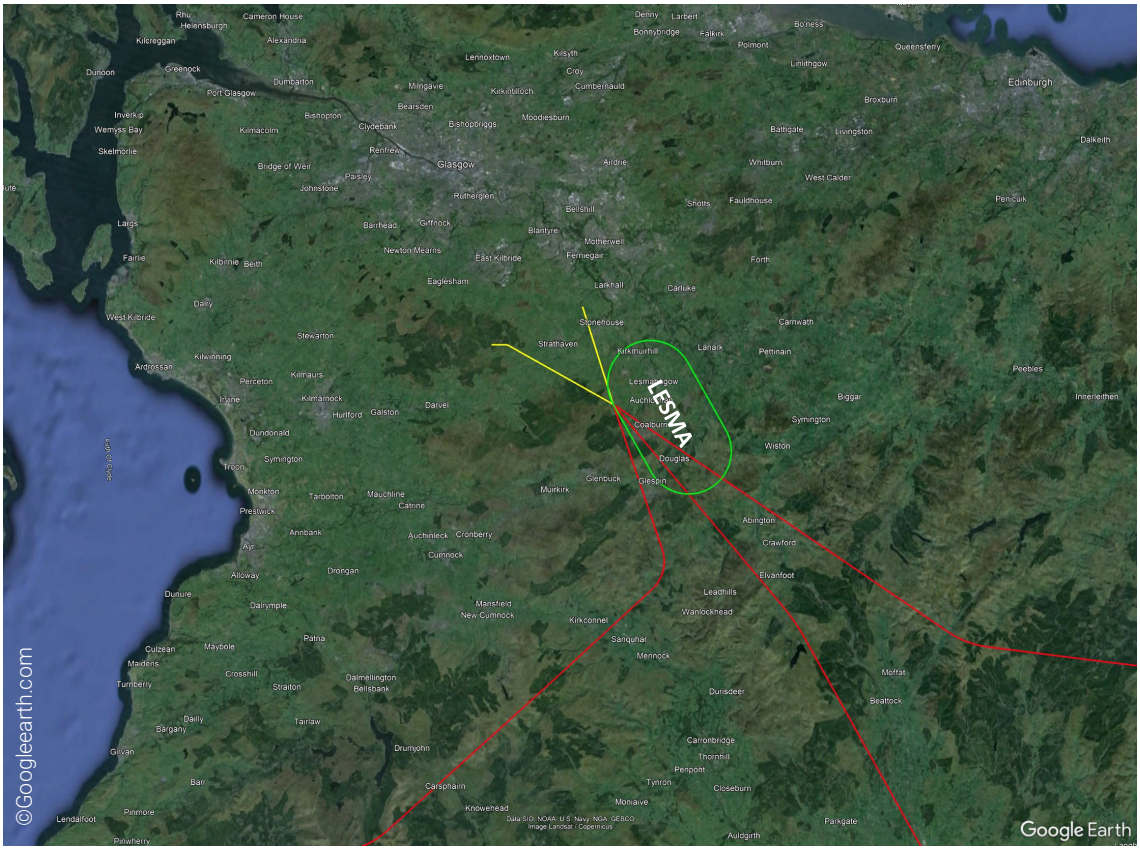

Figure 32: Location of proposed LESMA hold (green line) and associated STARs (red lines) and arrival transition above 7, 000 ft (yellow lines).

6.2.74 Aircraft arriving at Glasgow Airport using the proposed RYANN1G, ASLIB 2G or BURNS 1G STARs will either be cleared direct onto the arrival transition or required to hold to absorb delay and to facilitate the correct arrival spacing for aircraft. If aircraft are required to hold, this will be done using the proposed LESMA hold.

6.2.75 The LESMA hold will serve aircraft arriving at Glasgow Airport from the south and replaces the extant LANAK hold. It is approximately 5 NM south of the extant LANAK hold which allows the base level to be raised 2,000 ft to FL90. It is proposed to be approximately 21 NM southeast of Glasgow Airport, in the vicinity of Kirkmuirhill.

6.2.76 The highest terrain in the region of LESMA hold overflight is Common Hill (1601 ft). The LESMA hold does not overfly any National Scenic Areas, National Parks or AONBs.

6.2.77 The holding impact forecast for the LANAK and LESMA holds in 2027 and 2036 are shown below in Table 23.

	LANAK (2027)	LANAK (2036)	LESMA (2027)	LESMA (2036)
Holding Fix Location	554200.87N 0035618.64W		553648.3800N 0035738.8500W	
Inbound track	301.00		330	
Direction of PTN	Right		Right	
Speed (kts)	230		230	
Outbound Leg	4 NM		1 min	
Levels	FL70 – FL140		FL90 – FL140	
Highest Terrain (overflight agl)	1,080 ft (5,920 ft)		1,601 ft (7,399 ft)	
Total Aircraft Holding	10,370	11,664	7,564	7,619
Average Daily holding	~28	~32	~21	~21
Average Hold duration	4 min 6 s	4 min 30 s	3 min 12 s	3 min 6 s
Population overflown by hold	76,084		14,274	
Highest population elevation	1,000 ft		1,023 ft	
National Landscape/National Park/ NSA area overflown	None			

Table 23: Impact comparison between extant LANAK and proposed LESMA hold.

6.2.78 The introduction of the LESMA hold is forecast to reduce the average number of aircraft holding from ~28 to ~21 per day in 2027, and from ~32 to ~21 per day in 2036. The average holding time is forecast to fall by 54 s in 2027 and 1 min 24 s in 2036. This should deliver environmental benefits through reduced fuel burn/ CO_2e emissions as well as reducing the population overflown by holding aircraft by 61,810 people.

6.2.79 The LESMA hold is proposed to operate between FL90 and FL140, a raise in altitude of 2,000 ft, increasing the aircraft height whilst in the hold to >7,000 ft. Therefore, in line with the DfT guidance (Reference 13), no noise analysis is required.

6.2.80 Following the hold, aircraft will be cleared to fly one of two arrival transitions that are dependent on the runway in use. This procedure will provide a lateral track to the airfield and includes planned levels within the procedure to ensure aircraft remain procedurally separated from other aircraft within the vicinity flying other procedures. All interactions between adjacent procedures are described in Annex 3 of the Masterplan Iteration 3- Scotland (Reference 19) and in the CAF 2 work described here. This published procedure is included within the airport's submission. The lateral track of the procedure until the aircraft are expected to be at 7,000 ft is shown in Figure 32. Actual descent will be issued by ATC.

6.2.81 The CAA's Manual of Air Traffic Service (reference CAP493, link) is the standard instruction book for every provider of ATS in the UK. Section 1 Chapter 1 stipulates that one of the objectives of an ATS is to expedite and maintain an orderly flow of air traffic. Consistent with this objective, NERL and airport ATCOs may issue tactical shortcuts by vectoring aircraft away from the published procedures to expedite the flow of traffic as opportunities present themselves to deliver environmental benefits in addition to those described herein.

Controlled Airspace (CAS)

6.2.82 The ATS route structure, IFPs (STARs and holds) where changed are all proposed to be contained within CAS consistent with the CAA Policy for the Design of Controlled Airspace Structures (Reference 12). To achieve this hold tracks have been modelled and sufficient containment proposed. CAS volumes have been reviewed by SMEs and rationalised to ensure the minimal CAS volumes and classifications are requested to ensure the proposed design can be safely contained. Bases have been reviewed and superfluous airspace is proposed to be released (converted to Class G).

6.2.83 Considering the entirety of the CAS within the ScTMA (airports and NERL), the combined NERL, Edinburgh Airport and Glasgow Airport changes result in a net increase of CAS of 658.8 NM^3. This increase includes the new arrival and departure routes to the east, the Firth of Forth, which is expected to deliver substantial environmental savings through reduction in land overflight, fuel burn and CO_2e emissions. In isolation, the additional NERL airspace for this Firth of Forth connectivity amounts to 1332.6 NM^3. This airspace is over the water and above FL100 in airspace which is not regularly used by the VFR aircraft or gliders. This additional airspace has been offset by through the release of superfluous CAS elsewhere in the design and by the reclassification of 5296.2 NM^3 Class A airspace as Class C or D airspace. This has been enabled through reduced complexity of the airspace and results in an increased volume of accessible airspace for GA.

6.2.84 The airspace structures that contain the NERL Enroute portion of the change are CTAs and TMAs. The proposed changes are listed in the sections below.

Controlled Airspace- TMAs

6.2.85 The ScTMA sits atop the airport Control Areas (CTAs and CTRs) at the confluence of ATS routes in the vicinity of Glasgow Airport, Edinburgh Airport Glasgow Prestwick Airport. To fully understand the CAS requirements for the ScTMA an understanding of the details of the low-level airport led CAS changes is also required. For details of the low-level CAS changes below the ScTMA refer to the corresponding airport ACP documentation:

- ACP-2019-46: Glasgow Airport Airspace Change
- ACP-2019-32: Edinburgh Airport Airspace Change Programme (FASI).

6.2.86 The extant ScTMA is formed of 7 sections, named ScTMA 1-7. ScTMA 1-5 are Class D below FL195 and have a ceiling of FL245. ScTMA 6-7 are Class E+ airspace and have a ceiling of 6,000 ft. ScTMA 2 and ScTMA 4 are adjacent with the same vertical limits. Within UK airspace, all airspace between FL195 and FL660 is Class C. Therefore, the ScTMA structures can be simplified. The extant TMA has a combined volume of 9467.3 NM^3 for the portion contained below FL195.

6.2.87 The proposed ScTMA Airspace would be formed of 6 Class D sections. Class D has been selected throughout the TMA airspace as it is considered to provide sufficient protection and integration for both VFR and IFR traffic operating in close proximity due to the inclusion of a 250 kts speed limit below FL100. A constant airspace classification provides a simpler airspace design. As is the case today, transponder carriage and operation will remain a requirement for all traffic within the ScTMA.

6.2.88 ScTMA 5 is proposed to have a ceiling of FL95 whilst all other sections are proposed to have a ceiling of FL195.

6.2.89 The extant ScTMA 1-7 and the proposed ScTMA 1-6 described below in Figure 33.

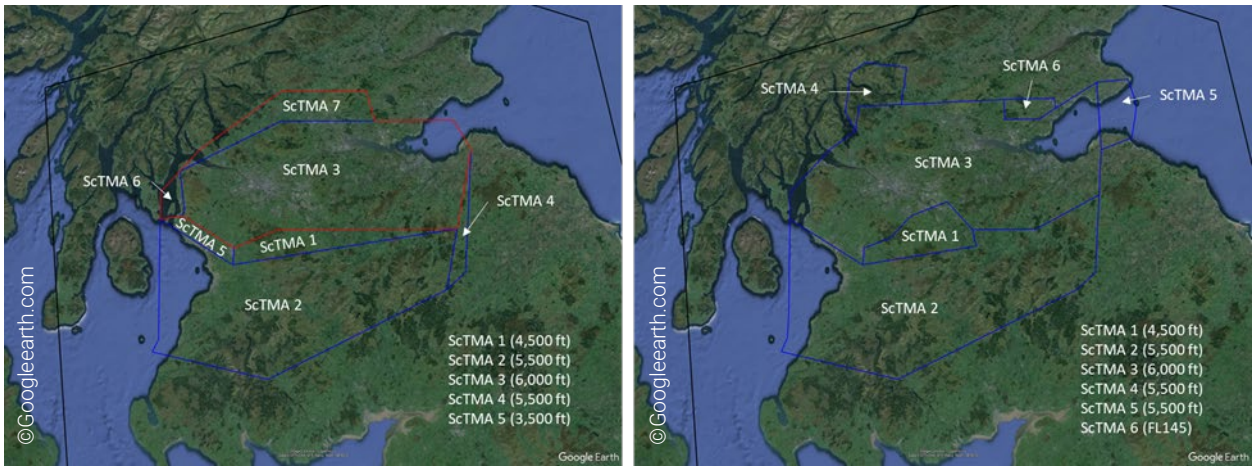

Figure 33: The extant ScTMA structure (left figure) and the proposed ScTMA structure (right figure).

6.2.90 The total volume of the proposed TMA structures up to FL195 is 9512.3 NM^3. This includes the additional CAS (ScTMA 5 (283.4 NM^3) and extended ScTMA 3 (4237.0 NM^3) to provide the required containment for the proposed Firth of Forth routings. This represents a net increase of 45.1 NM^3.

Proposed Controlled Airspace- ScTMA 1

6.2.91 ScTMA 1 shown in Figure 34 has vertical dimensions of 4,500 ft to FL195. It contains the routes and IFPs listed in Table 24.

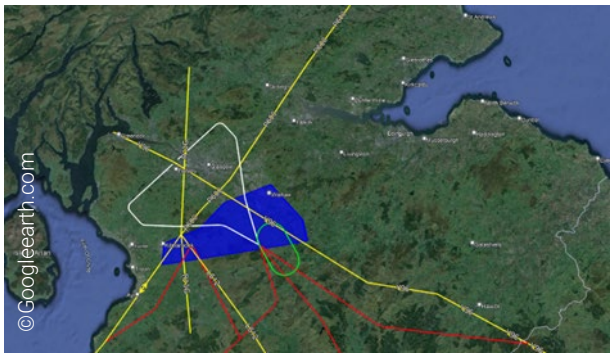

Figure 34: ScTMA 1 (blue shape) location. ATS routes are shown in yellow, STARs in red, holds in green, transitions in white and SIDs in orange.

ATS Routes	P600, R13G, L612, Y96
IFP- STARs	RYANN 1G, ASLIB 1G, BURNS 1G
IFP- Holds	LESMA
IFP- Transitions	LESMA 1T/Q SUMIN2S TRN2S
IFP- SIDs	None

Table 24: Routes and IFPs contained within ScTMA 1.

6.2.92 The shape of ScTMA 1 has been updated to release CAS east of Thankerton. The northern edge of ScTMA 1 has moved north to contain the Glasgow Airport LESMA transitions.

6.2.93 The proposed ScTMA 1 has a total volume of 506.1 NM^3.

Proposed Controlled Airspace- ScTMA 2

6.2.94 ScTMA 2 shown in Figure 35 has vertical dimensions of 5,500 ft to FL195. It contains the routes and IFPs listed in Table 25.

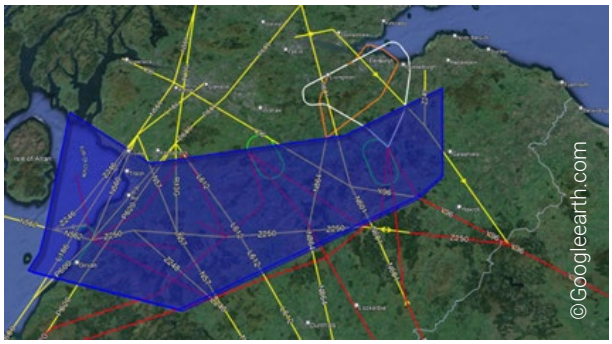

Figure 35: ScTMA 2 (blue shape) location. ATS routes are shown in yellow, STARs in red, holds in green, transitions in white and SIDs in orange.

ATS Routes	L186, L612, N560, N562, N57, N601, N864, P600, P620, Y96, Z246, Z247, Z248, Z249, Z250, R13G, R2G
IFP- STARs	RYANN 1G, ASLIB 1G, BURNS 1G, ARANN 1E, RANRA 1E, INPIP 2E, AGPED 2E, APPLE 2P, RIBEL 2P
IFP- Holds	TART3, LESMA, TRN, SUMIN
IFP- Transitions	TART3 06/24, TRN2Q, TRN2S, SUMIN2S, SUMIN2R, TRN2R
IFP- SIDs	EMBER 1A/1B

Table 25: Routes and IFPs contained within ScTMA 2.

6.2.95 The shape of ScTMA 2 has been updated to the east to incorporate part of the extant ScTMA4. The north-eastern edge has been extended to incorporate the part of the extant ScTMA1 released from ScTMA 1 and part of the extant ScTMA 3.

6.2.96 ScTMA 2 has a total volume of 4133.6 NM^3.

Proposed Controlled Airspace- ScTMA 3

6.2.97 ScTMA 3 shown in Figure 36 has vertical dimensions of 6,000 ft to FL195. It contains the routes and IFPs listed in Table 26.

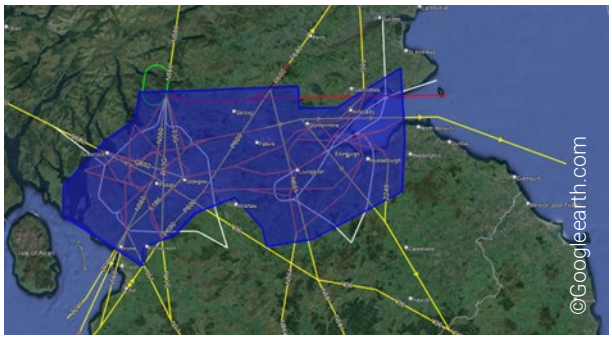

Figure 36: ScTMA 3 (blue shape) location. ATS routes are shown in yellow, STARs in red, holds in green, transitions in white and SIDs in orange.

ATS Routes	L186, N560, N57, N601, N864, P600, Q602, T3G, T8G, Y96, Z246, Z249, R13G, R2G, R3G
IFP- STARs	DOPEY 1G, EDUNU 1G
IFP- Holds	COYLE Holding fix
IFP- Transitions	All Edinburgh Airport and Glasgow Airport transitions.
IFP- SIDs	All Edinburgh Airport and Glasgow Airport departures.

Table 26: Routes and IFPs contained within ScTMA 3.

6.2.98 The shape of ScTMA 3 has been updated to the north to provide containment for the Glasgow Airport DOPEY 1G and, EDUNU 1G STARs. The shape has been updated to the northeast to contain the Edinburgh Airport STOBS and WORM2 transitions as well as departure routes using the Firth of Forth and to the northeast.

6.2.99 To the North of the TMA the extant Class E+ airspace has been removed between 4,000 ft and 6,000 ft. The base has been raised from 4,000 ft to 6,000 ft increasing availability for GA aircraft without a fitted transponder.

6.2.100 ScTMA 3 has a total volume of 4237.0 NM^3.

Proposed Controlled Airspace- ScTMA 4

6.2.101 ScTMA 4 shown in Figure 37 is an expansion of the existing TMA airspace to provide airspace containment for the COYLE hold. Currently, the extant FOYLE hold which was in this area was not afforded airspace containment and therefore is not in adherence with CAA policy. The

proposed TMA has been formed from the extant MORAY CTA13 which has a base of 5,500 ft. The proposed ScTMA 4 has vertical dimensions of 5,500 ft to FL195. It contains the routes and IFPs listed in Table 27.

Figure 37: ScTMA 4 (blue shape) location. ATS routes are shown in yellow, STARs in red, holds in green, transitions in white and SIDs in orange.

ATS Routes	N560
IFP- STARs	KINGS1G, DOPEY1G, EDONU1G
IFP- Holds	COYLE
IFP- Transitions	None
IFP- SIDs	None

Table 27: Routes and IFPs contained within ScTMA 4.

6.2.102 GA Access to this air space has been reduced by reclassifying the Class E+ MORAY CTA13 as airspace to Class D. VFR aircraft will now be required to obtain an ATC clearance prior to entering this airspace above 5,500 ft.

6.2.103 ScTMA 4 is proposed to have a total volume of 308.8 NM^3.

Proposed Controlled Airspace- ScTMA 5

6.2.104 ScTMA 5 shown in Figure 38 is an expansion of the existing TMA airspace to provide airspace containment for aircraft using the proposed new Firth of Forth routings and associated airport IFPs. Previously this airspace was Class G. The proposed ScTMA 5 has vertical dimensions of 5,500 ft to FL95. It contains the routes and IFPs listed in Table 28.

Figure 38: ScTMA 5 (blue shape) location. ATS routes are shown in yellow, STARs in red, holds in green, transitions in white and SIDs in orange.

ATS Routes	R3G
IFP- STARs	None
IFP- Holds	None
IFP- Transitions	WORM2 06/24
IFP- SIDs	GULLY1A

Table 28: Routes and IFPs contained within ScTMA 5.

6.2.105 GA access to this air space has been reduced by introducing new Class D airspace. VFR aircraft will now be required to obtain an ATC clearance prior to entering this airspace or remain below 5,500 ft to transit below without a clearance.

6.2.106 ScTMA 5 has a total volume of 283.4 NM^3.

6.2.107 Use of ScTMA 5 will be conditional based on the activation of EG D514.

Proposed Controlled Airspace- ScTMA 6

6.2.108 ScTMA 6 shown in Figure 39 is an expansion of the existing TMA airspace to provide airspace containment for aircraft arriving at Glasgow Airport using the proposed new Firth of Forth

routings. Previously this airspace was Class G. The proposed ScTMA 6 has vertical dimensions of FL145 to FL195. It contains the routes and IFPs listed in Table 29.

Figure 39: ScTMA 6 (blue shape) location. ATS routes are shown in yellow, STARs in red, holds in green, transitions in white and SIDs in orange.

ATS Routes	None
IFP- STARs	DOPEY1G
IFP- Holds	None
IFP- Transitions	None
IFP- SIDs	None

Table 29: Routes and IFPs contained within ScTMA 6.

6.2.109 GA access to this air space has been reduced by introducing new Class D airspace. VFR aircraft will now be required to obtain an ATC clearance prior to entering this airspace or remain below FL145 to transit below without a clearance.

6.2.110 ScTMA 6 has a total volume of 43.5 NM^3.

Controlled Airspace- CTAs

6.2.111 CTAs are used to provide defined areas of CAS in which aviation activities can be undertaken in a known environment. All ATS routes impacted by this change are contained within defined CTAs and these are proposed to be updated as described in the sections below. The extant and proposed CTAs are shown in Figure 40.

6.2.112 Within UK airspace, all airspace between FL195 and FL660 is Class C. The defined lateral limits of this change contain CTA's which start or extend upwards above FL195. Therefore, the ScTMA structures can be simplified. All CTAs contained either wholly or partially within the lateral limits of the change are proposed to have a ceiling not above FL195. This will simplify the airspace definition and remove superfluous CTA airspace structures from the AIP.

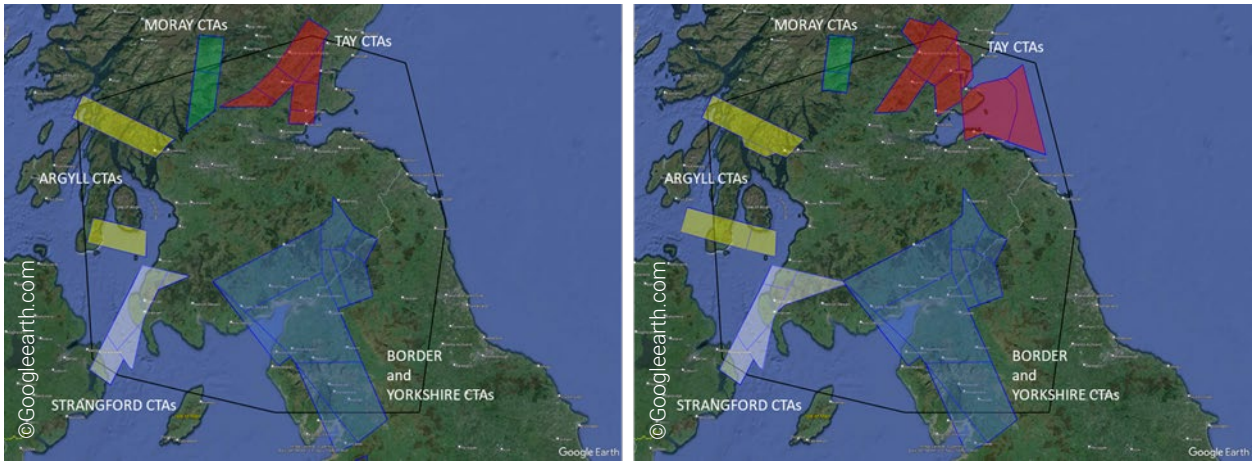

Figure 40: The extant CTAs (as published in the UK AIP) encapsulating the principal traffic flows into the ScTMA (left figure) and the proposed CTA structure (right figure).

Proposed Controlled Airspace- MORAY CTAs

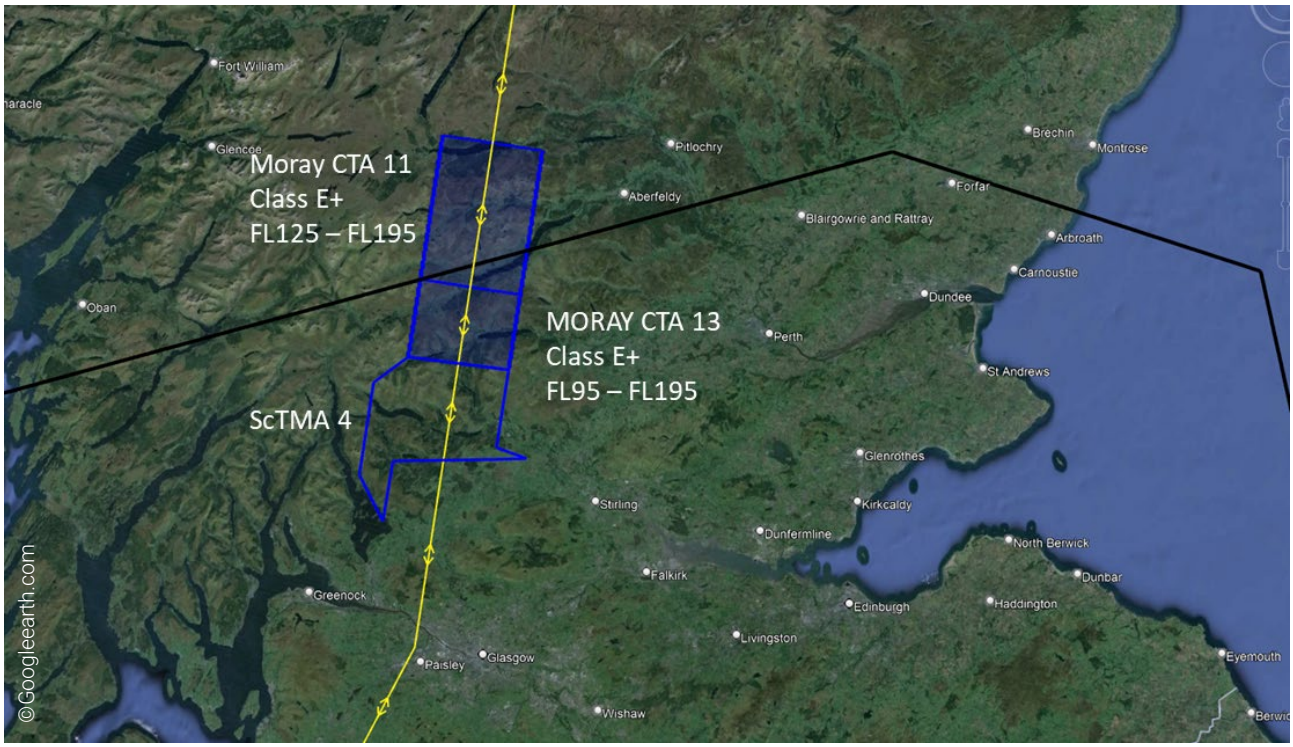

Figure 41: Proposed locations of Moray CTA 11 and CTA 12. ATS routes are shown in yellow, STARs in red, holds in green, transitions in white and SIDs in orange.

6.2.113 MORAY CTAs 11 and 13 shown in Figure 41 provide containment for the ATS route N560. MORAY CTA11 is unchanged from the existing airspace.

6.2.114 MORAY CTA13 is proposed to be updated as part of this change. The southern border has been moved to align with the new ScTMA 4 which incorporates the southern portion of the extant MORAY CTA13. The base of the remaining portion of MORAY CTA13 has been raised to FL95 with the CAS volume between 5,500 ft and FL95 being reclassified as Class G airspace.

6.2.115 Both Moray CTA11 and 13 are proposed to remain Class E+ therefore there is no reduction in GA access due to airspace classification (as described above, GA access within ScTMA 4 is reduced due to the airspace being reclassified as Class D). GA access (for aircraft without a transponder) due to raising the base levels in MORAY CTA 13 by 4,000 ft is increased.

6.2.116 The MORAY CTA 11 airspace volume is unchanged. It has a total volume of 164.7 NM^3.

6.2.117 The MORAY CTA 13 airspace volume is reduced. It has a total volume of 317.6 NM^3, a reduction in volume of 127.1 NM^3.

Proposed Controlled Airspace- TAY CTAs

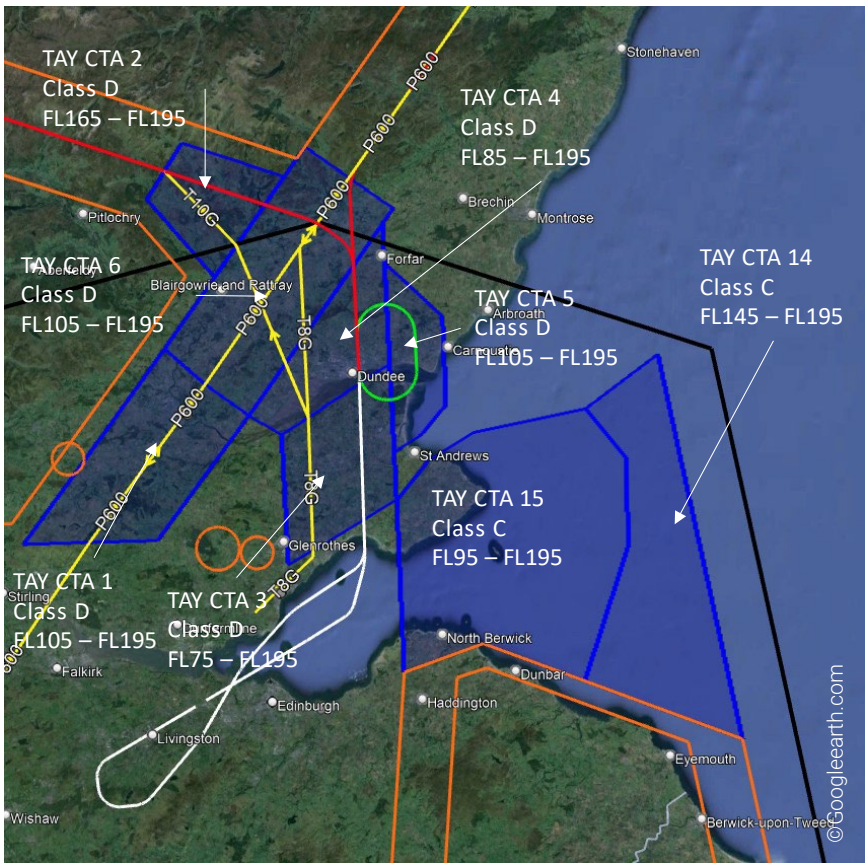

Figure 42: Proposed locations of TAY CTA 1, CTA 2, CTA 3, CTA 4, CTA 5, CTA 6, CTA 14, and CTA 15. ATS routes are shown in yellow, STARs in red, holds in green, transitions in white and SIDs in orange.

6.2.118 TAY CTAs 1- 6 and CTAs 14-15 shown in Figure 42 have been realigned as a consequence of removing the STIRA hold and to reduce congestion north of the TMA thereby improving airspace access for Portmoak gliding and Strathallan Glenrothes parachuting.

6.2.119 The proposed TAY CTA 1 incorporates airspace which was included in the extant TAY CTA1 and CTA 2. This CTA has been realigned due to the straightening of P600. The realignment has reduced the required airspace to the western edge whilst increasing the required airspace to the east. This reduces the land area of CAS for this containment, increasing Class G airspace for GA use. The CAS base of the proposed TAY CTA 1 and 2 is higher than the airspace which it replaces. In the southern portion the base is proposed to be raised from 5,500 ft whilst in the northern portion the base is proposed to be raised from FL85.

6.2.120 The proposed TAY CTA 2 is a new CAS structure to provide containment for T10G and JOSSY 1E STAR. The base of this airspace is proposed to be FL165 to allow for a consistent decent profile to the STOBS hold. This containment alleviates congestion in the northern portion of the ScTMA by providing a dedicated arrival route for aircraft arriving from the oceanic tracks.

6.2.121 The proposed TAY CTA 3 provides containment for the ATS route T8G, the STOBS arrival transitions as well as for the STOBS hold. This route is available H24 whereas the extant N864 route is only available at weekends. N864 was contained in airspace with a base of FL85. The proposed base of this airspace is FL75 to provide containment for aircraft departing Edinburgh on a STOPP departure via T8G. This new route alleviates congestion with traffic arriving at Glasgow Airport via P600.

6.2.122 The proposed TAY CTA 4 provides containment for the ATS routes T8G and T10G, the STOBS transitions as well as for the STOBS hold and the NAXIL 1E and JOSEY 1E STARs between TAY CTA 3 and CTA 6. This route is proposed to be available H24 whereas the extant N864 route is only available at weekends. The proposed base of CAS for this CTA is FL85.

6.2.123 The proposed TAY CTA 5 provides containment for the STOBS hold. It is proposed to have a base of FL105, the lowest level of the STOBS hold is FL110.

6.2.124 The proposed TAY CTA 6 has the same dimensions as the extant TAY CTA 6.

6.2.125 The airspace classification for TAY CTA's 1-6 has been reduced from Class A to Class D. This provides greater access to VFR traffic who are not permitted in Class A airspace.

6.2.126 The TAY CTAs 14 and 15 are new CAS volumes which are proposed to be introduced to provide containment for the new Firth of Forth connectivity. This airspace is proposed as Class C due to the volume of traffic and complexity of the airspace. TAY CTA 14 and 15 will be conditional based on the activation of EG D514.

6.2.127 When active, TAY CTAs 3-5 will be used by additional traffic that would normally use the proposed Firth of Forth access routes.

6.2.128 VFR aircraft will be able request clearance to enter the TAY CTAs or are able to transit underneath without a clearance.

6.2.129 These amendments have been discussed with the MoD in advance of this consultation with emphasis placed on airspace access requirements for Leuchars. NATS is cognisant of this requirement and proposes agreeing an LOA that defines such access in line with CAA policy (Reference 17).

6.2.130 The TAY CTA 1 has a total volume of 268.1 NM^3.

6.2.131 The TAY CTA 2 has a total volume of 40.7 NM^3.

6.2.132 The TAY CTA 3 has a total volume of 252.8 NM^3.

6.2.133 The TAY CTA 4 has a total volume of 190.1 NM^3.

6.2.134 The TAY CTA 5 has a total volume of 99.4 NM^3.

6.2.135 The TAY CTA 6 has a total volume of 343.6 NM^3.

6.2.136 The new TAY CTA 14 airspace volume is 214.0 NM^3.

6.2.137 The new TAY CTA 15 airspace volume is 696.2 NM^3.

Proposed Controlled Airspace- BORDERS and YORKSHIRE CTAs

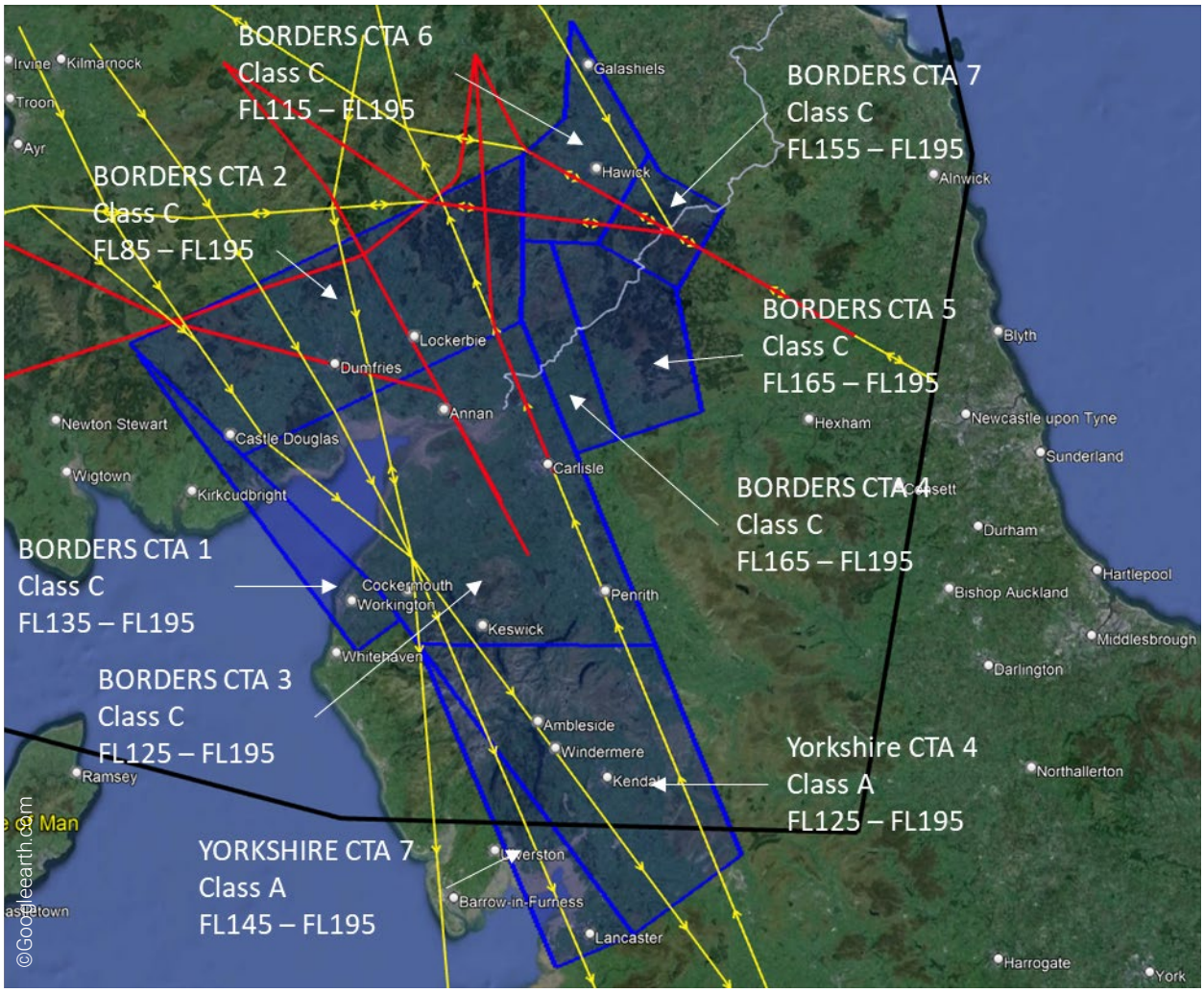

Figure 43: Proposed locations of BORDERS CTA 1, CTA 2, CTA 3, CTA 4, CTA 5, CTA 6, CTA 7 and YORKSHIRE CTA 4 and CTA7. ATS routes are shown in yellow, STARs in red, holds in green, transitions in white and SIDs in orange.

6.2.138 The proposed locations of BORDERS CTA 1, CTA 2, CTA 3, CTA 4, CTA 5, CTA 6, CTA 7, and YORKSHIRE CTA 4 and CTA 7 are shown in Figure 43.

6.2.139 BORDERS CTA 6 and 7 provide containment for connectivity to the south-east via NATEB. This includes ATS Routes R2G, Y96 and Z250. It also provides containment for the AGPED 2E and BURNS 1G STARs.

6.2.140 BORDERS CTA 2 and 3 provide containment for connectivity to the south. This includes ATS Routes L612, N57, N601, N864, Z248, Z250. It also provides containment for the ARANN 1E, INPIP 1E, RANRA 1E, ASLIB 2G, BURNS 1G and SCARF 1P STARs.

6.2.141 BORDERS CTA 1, 4 and 5 are extant areas used for contingency emergency and sequencing and this use will be retained. The classification has been amended from Class A (Class D for BORDERS CTA5) to Class C to reflect this usage and to simplify the classification across the region. This will increase availability to GA aircraft.

6.2.142 It should be noted that BORDERS CTAs 4 and 5 are conditional airspace used when not required by Spadeadam. These CTAs will continue to be used in line with the extant LOA.

6.2.143 The YORKSHIRE CTAs 4 and 7 are unchanged from the existing airspace and provide containment for ATS routes L612, N57 and N601. The Class A classification has been retained to align with the airspace outside of the impacted area.

6.2.144 The BORDERS CTAs 1-5 are the same dimensions as the existing airspace. However, the airspace classification has been lowered from Class A to Class C enabling access to VFR aircraft.

6.2.145 BORDERS CTA 6 and 7 have been extended by approximately 2 NM along the northeastern edge to provide containment for the proposed ATS route R2G.

6.2.146 BORDERS CTA 8 (Class A, 1456.5 NM^3) has been removed in the proposed design as this airspace between FL95 and FL125 was identified as no longer being required.

6.2.147 VFR aircraft will be required to request entry clearance from ATC and will be subject to an ATC service.

6.2.148 The BORDERS CTA 1 has a total volume of 132.3 NM^3. (Class A to Class C)

6.2.149 The BORDERS CTA 2 has a total volume of 1,187.6 NM^3. (Class A to Class C)

6.2.150 The BORDERS CTA 3 has a total volume of 1,019.6 NM^3. (Class A to Class C)

6.2.151 The BORDERS CTA 4 has a total volume of 56.8 NM^3. (Class A to Class C)

6.2.152 The BORDERS CTA 5 has a total volume of 100.7 NM^3. (Class D to Class C)

6.2.153 The BORDERS CTA 6 has a total volume of 239.6 NM^3. (Class A to Class C)

6.2.154 The BORDERS CTA 7 has a total volume of 66.5 NM^3. (Class A to Class C)

6.2.155 The YORKSHIRE CTA 4 has a total volume of 663.6 NM^3.

6.2.156 The YORKSHIRE CTA 7 has a total volume of 143.2 NM^3.

Proposed Controlled Airspace- STRANGFORD CTAs

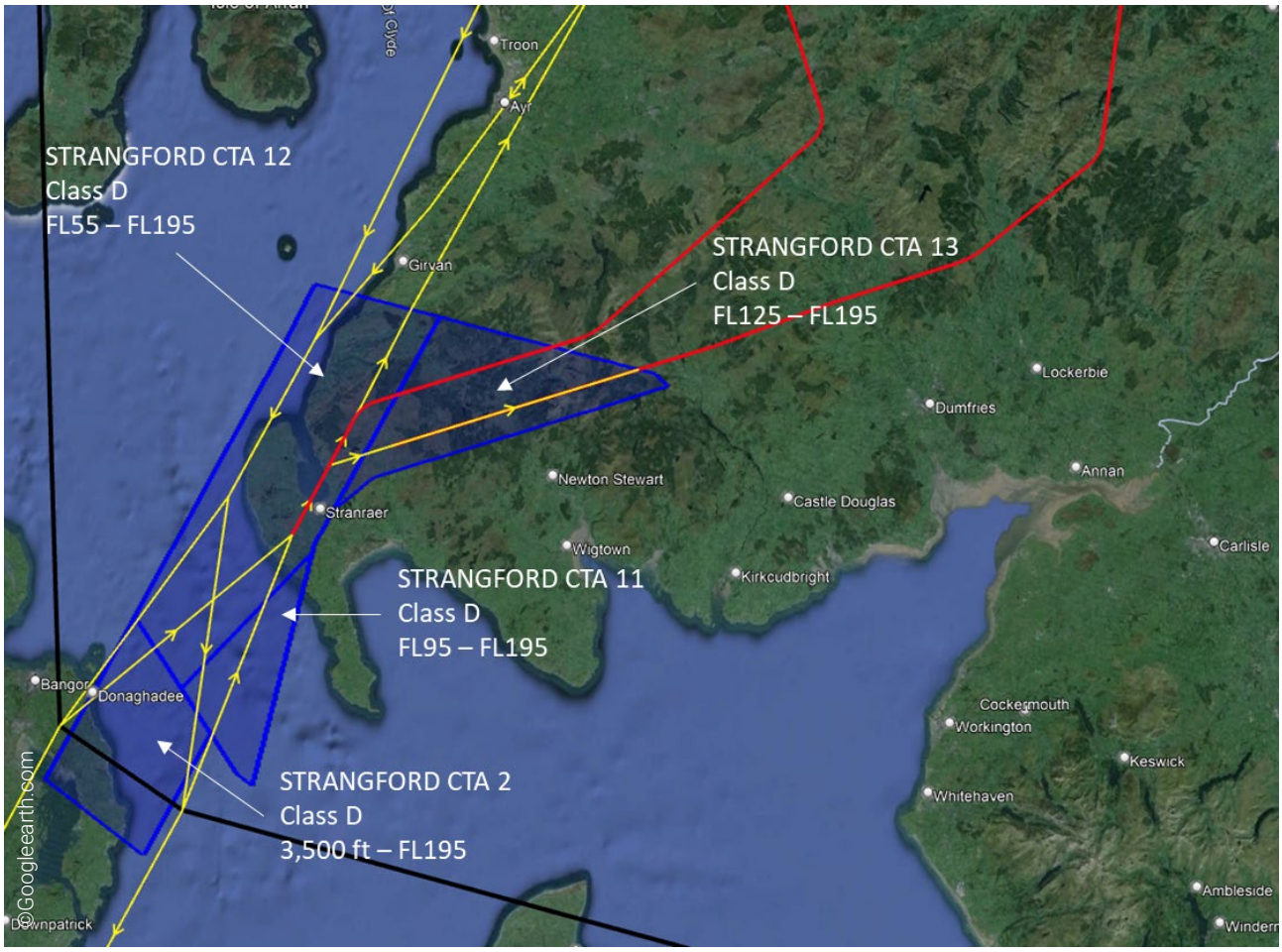

Figure 44: Proposed locations of STRANGFORD CTA 2, CTA 11, CTA 12, and CTA 13. ATS routes are shown in yellow, STARs in red, holds in green, transitions in white and SIDs in orange.

6.2.157 The STRANGFORD CTAs shown in Figure 44 provide containment for the traffic arriving from or departing to the Irish interface. This airspace is proposed to remain Class D airspace.

6.2.158 STRANGFORD CTA 2 provides containment for the ATS Routes P600, P620 T6G and T5G and is unchanged from the extant CTA.

6.2.159 STRANGFORD CTA 11 provides containment for the ATS Routes P620 and T5G and is unchanged from the extant CTA.

6.2.160 STRANGFORD CTA 12 provides containment for the ATS Route P600, P620, T6G and T5G as well as the RYANN 1P STAR and is unchanged from the extant CTA.

6.2.161 STRANGFORD CTA 13 provides containment for the ATS Route R195G, L186, P600, P620, and the RANRA 1E and RYANN 1G STARs.

6.2.162 STRANGFORD CTA 13 has been extended south to provide containment for the proposed ATS route R195G and the RANRA 1E and RYANN 1G STARs. This connectivity facilitates aircraft arriving at Edinburgh Airport and Glasgow Airport from the Irish interface to remain higher for longer increasing environmental benefits (noise, fuel and CO_2e). Previously these aircraft would have flown the TUNSO 1E STAR and descended to FL70 early to transit below departing aircraft. By moving this track south aircraft can remain deconflicted from the departure routes.

6.2.163 The STRANGFORD CTA 2 has a total volume of 345.0 NM^3.

6.2.164 The STRANGFORD CTA 11 has a total volume of 124.6 NM^3.

6.2.165 The STRANGFORD CTA 12 has a total volume of 534.6 NM^3.

6.2.166 The STRANGFORD CTA 13 has a total volume of 178.6 NM^3.

Proposed Controlled Airspace- ARGYLL CTAs

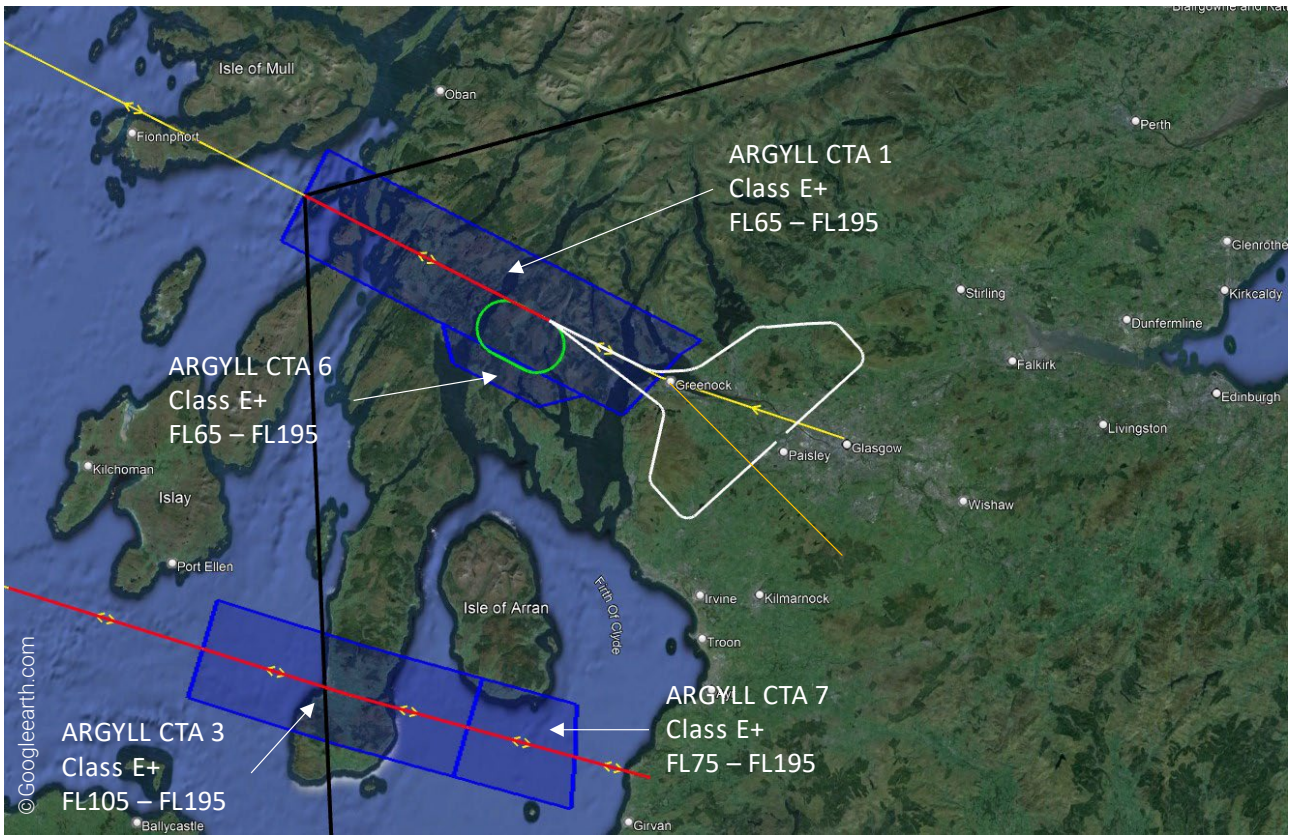

Figure 45: Proposed locations of ARGYLL CTA1, CTA3, CTA6 and CTA7. ATS routes are shown in yellow, STARs in red, holds in green, transitions in white and SIDs in orange.

6.2.167 The ARGYLL CTAs shown in Figure 45 provide containment for the traffic to and from the Outer Hebrides for traffic to join the transatlantic oceanic tracks. This airspace is proposed to remain Class E+ (Class E with a TMZ) airspace.

6.2.168 Class E+ airspace provides improved ATC traffic awareness that enables them to discharge their safety responsibilities commensurate with expected IFR traffic demand, whilst not overly restricting GA access due to the requirement to be transponder equipped.

6.2.169 ARGYLL CTA 1 provides containment for the ATS Route Q602, the BRUCE 2G STAR, the FYNER hold and the FYNER arrival transitions for Glasgow airport. ARGYLL CTA 1 is proposed to be amended to have a base level of FL65, raised from 5500 ft.

6.2.170 ARGYLL CTA 3 provides containment for the ATS Route N562 and the AMCON 1P STAR.

6.2.171 ARGYLL CTA 3 has been extended to the west to ensure N562 is contained within CAS. This is consistent with the requirements set out in ICAO Annex 11 (Reference 18) and the CAA Policy for the Design of Controlled Airspace Structures (Reference 12).

6.2.172 ARGYLL CTA 6 provides containment for the FYNER hold in line with the CAA Policy for the Design of Controlled Airspace Structures (Reference 12).

6.2.173 ARGYLL CTA 7 provides containment for the ATS Route N562 and the AMCON 1P STAR. This CTA sits over the eastern portion of the extant CTA but has a lower base of FL75. This lowered base is to ensure that Prestwick arrivals and departures remain within CAS whilst following their IFP or the ATS route network in line with the CAA Policy for the Design of Controlled Airspace Structures (Reference 12).

6.2.174 The ARGYLL CTA 1 has a total volume of 894.0 NM^3.

6.2.175 The ARGYLL CTA 3 has a total volume of 398.4 NM^3.

6.2.176 The ARGYLL CTA 6 has a total volume of 79.2 NM^3.

6.2.177 The ARGYLL CTA 7 has a total volume of 211.3NM^3.

SUA Updates

6.2.178 Existing SUA airspace within the Scottish FIR have been treated as a constraint on the design. However, to deliver this proposed design certain SUAs will require updating to ensure the airspace design remains safe and efficient. These are described below.

Danger Area Updates-D514

Figure 46: The extant D514 structure (in yellow, left figure (as published in the UK AIP)) and the proposed D514 structure (in yellow, right figure) the deleted portion is shown in red. ATS routes are shown in yellow, STARs in red, holds in green, transitions in white and SIDs in orange.

6.2.179 Figure 46 shows the extant and proposed lateral limits of D514- Combat Airspace. This airspace is used for High Energy Manoeuvres / Ordnance, Munitions and Explosives (OME) / Electrical / Optical Hazards between FL85 and FL660. It is expected to be activated up to 55 times per annum for up to 4 hours at a time.

6.2.180 When active, the Firth of Forth arrival and departure routes will not be available. Aircraft will have to use alternative routes via Y96 and P600. To ensure the proposed design is fully contained within CAS when D514 is active, the perimeter of D514 will require updating. The northwestern edge will require updating to accommodate traffic arriving via the STOBS hold as well as traffic departing via T8G.

6.2.181 The northwestern edge will require updating to accommodate traffic arriving via the JOSSY 1E and NAXIL 1E STARs as well as aircraft holding at STOBS.

6.2.182 The southwestern edge will require updating to accommodate traffic departing Edinburgh Airport via R2G.

6.2.183 These amendments have been discussed with the MoD in advance of this consultation; and the MoD is invited to respond on this specific proposal.

TRA Updates- TRA 004

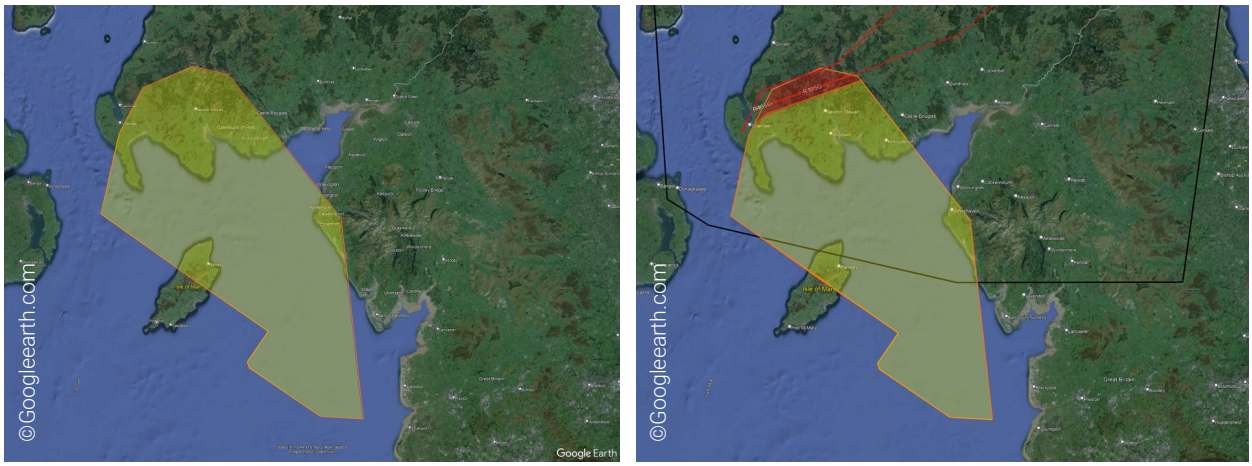

Figure 47: The extant TRA04 structure (in yellow, left figure (as published in the UK AIP)) and the proposed TRA04 structure (in yellow, right figure) the deleted portion is shown in red. ATS routes are shown in yellow, and STARs in red,

6.2.184 Figure 47 shows the extant and proposed lateral limits of TRA 004 which operates Mon-Fri 0830-1700 (0730-1700) between FL195 and FL245.

6.2.185 The northern edge will require updating to accommodate traffic arriving at Edinburgh Airport via the proposed R195G and the RANRA 1E STAR, and Glasgow Airport via the proposed RYANN 1G STAR contained within the amended Strangford CTA 13.

6.2.186 These amendments have been discussed with the MoD in advance of this consultation; it is emphasised that airspace access is not affected by these proposed amendments and the MoD is invited to respond on this specific proposal.

TRA Updates- TRA 007

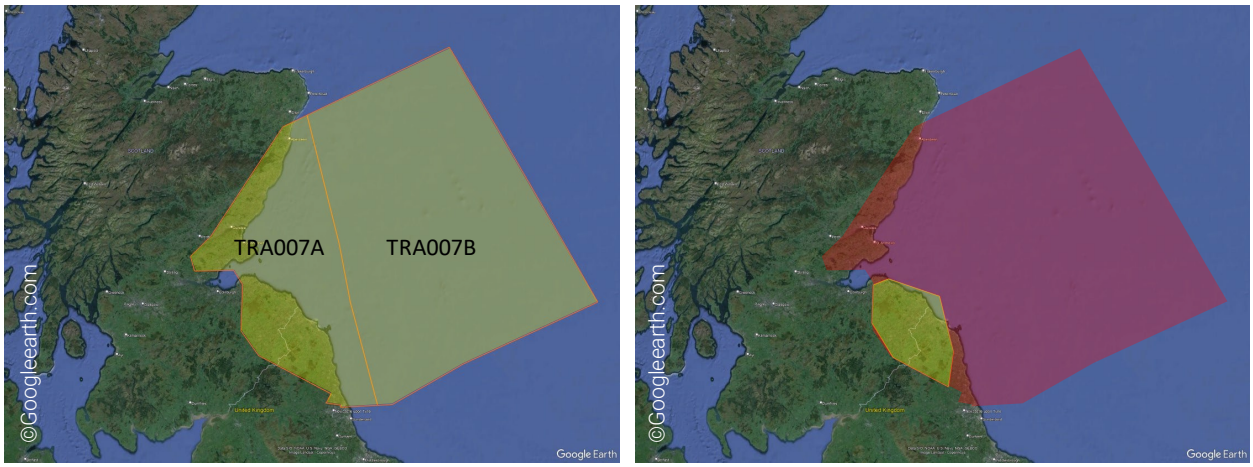

Figure 48: The extant TRA007A and 007B structures (in yellow, left figure (as published in the UK AIP)) and the proposed TRA007 structure (in yellow, right figure) the deleted portion is shown in red.

6.2.187 Figure 48 shows the extant and proposed lateral limits of TRA 007 which operates Mon-Fri 0830-1700 (0730-1700) between FL195 and FL245.

6.2.188 It is proposed to remove TRA 007B to facilitate the arrival and departure of aircraft through the Firth of Forth airspace. This area is over the sea where Danger Areas (EG D323, D513, D514, D613) also exist which accommodate MoD requirements and are unaffected by this proposal.

6.2.189 TRA 007A is proposed to be amended to aligned with the Operational Training Area E as shown, removing those elements associated with Firth of Forth access and ingress.

6.2.190 These amendments have been discussed with the MoD in advance of this consultation; it is emphasised that airspace access is not affected by these proposed amendments and the MoD is invited to respond on this specific proposal.

TRA Updates- TRA 008

Figure 49: The extant TRA008B and 008C structures (in yellow, left figure (as published in the UK AIP)) and the proposed TRA008B and 008C structures (in yellow, right figure) the deleted portions are shown in red.

6.2.191 Figure 49 shows the extant and proposed lateral limits of TRA 008B and 008C which operate Mon-Fri 0830-1700 (0730-1700) between FL195 and FL245.

6.2.192 It is proposed to update the lateral limits of TRA 008B as shown to facilitate the arrival and departure of oceanic traffic via FRA for Edinburgh Airport.

6.2.193 It is proposed to update of the lateral limits of TRA 008C as shown to ensure aircraft remain within the confines of CAS should they be required to hold at high-level at COYLE or FYNER.

6.2.194 These amendments have been discussed with the MoD in advance of this consultation; it is emphasised that airspace access is not affected by these proposed amendments and the MoD is invited to respond on this specific proposal.

TRA(G) Updates- Northumbria

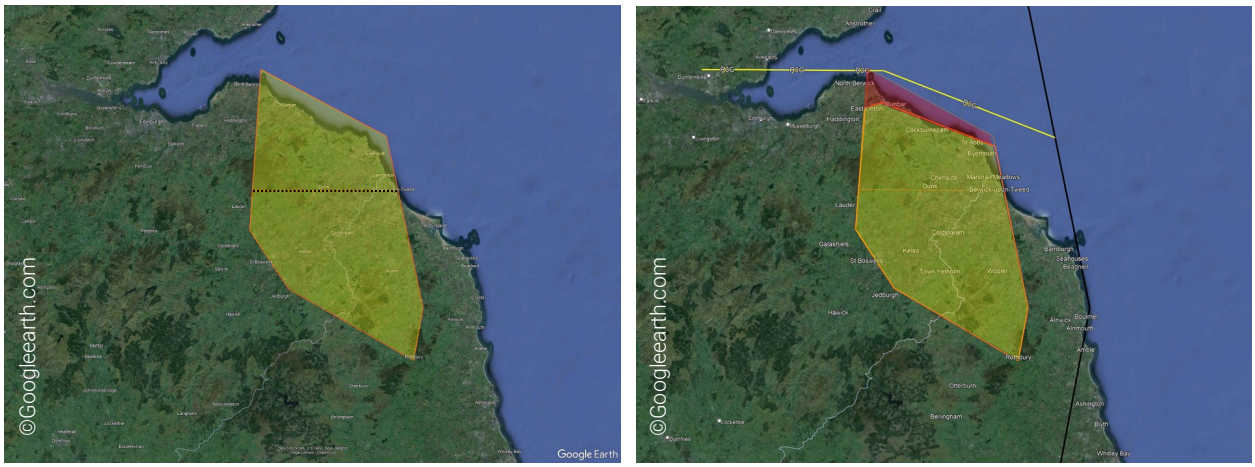

Figure 50: The extant Northumbria North and South Gliding areas (in yellow, left figure (as published in the UK AIP)) and the proposed Northumbria Gliding area (in yellow, right figure) the deleted portion is shown in red. ATS routes are shown in yellow.

6.2.195 TRA(G)s are operated under an LOA between the British Gliding Association and NATS. When activated in accordance with agreed protocols, they permit gliding activity to be undertaken within the defined area of Class C airspace between FL195 and FL245 without the need for pilots to carry or operate a Secondary Surveillance Radar (SSR) transponder or maintain radio contact. Access to airspace for suitably equipped gliders operating above FL195 outside of TRA(G)s are unaffected by any of the proposals within this consultation document.

6.2.196 Figure 50 shows the extant and proposed lateral limits of the Northumbria gliding area which are activated by NOTAM with 2 hours' notice between FL195 and FL245 on weekends or public holidays. Currently only either the north or south gliding areas can be activated at any one time.

6.2.197 To ensure the southern Firth of Forth departure route, R3G, remains within CAS it will be necessary to amend the northern boundary of the Northumbria north TRA(G). To accommodate this, it is proposed to combine the north and south gliding areas into a single Northumbria gliding area increasing the overall volume of the TRA(G). Availability would remain as per the current arrangements.

TRA(G) Updates- Portmoak and Scottish Lower South

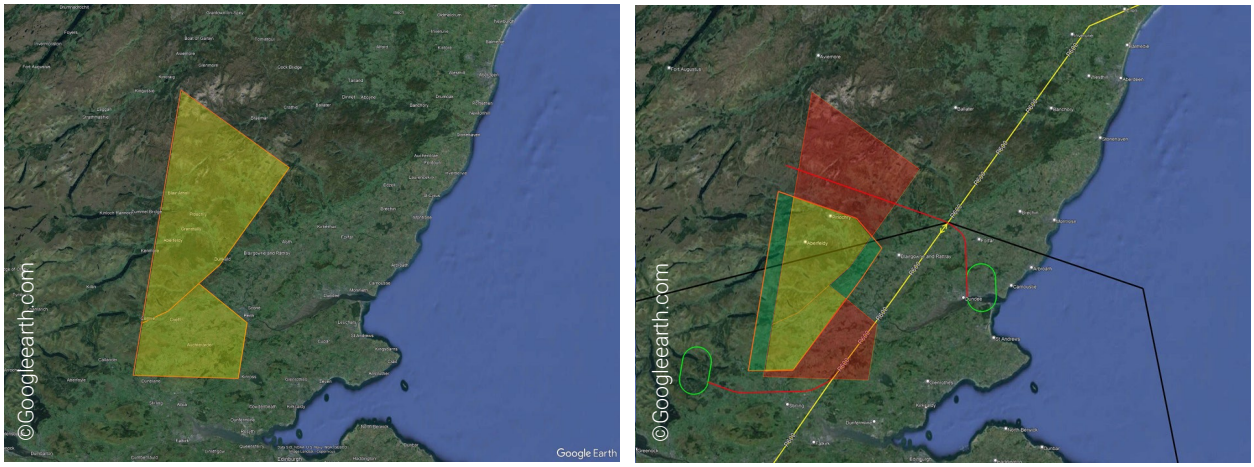

Figure 51: The extant Portmoak and Scottish Lower South Gliding areas (in yellow, left figure (as published in the UK AIP)) and the proposed Portmoak Gliding area (in yellow (existing TRA(G)) and green (new TRA(G)), right figure) the deleted portion is shown in red. ATS routes are shown in yellow, STARs in red, holds in green.

6.2.198 TRA(G)s are operated under an LOA between the British Gliding Association and NATS. When activated in accordance with agreed protocols, they permit gliding activity to be undertaken within the defined area of Class C airspace between FL195 and FL245 without the need for pilots to carry or operate an SSR transponder or maintain radio contact. Access to airspace for suitably equipped gliders operating above FL195 outside of TRA(G)s are unaffected by any of the proposals within this consultation document.

6.2.199 Figure 51 shows the extant Portmoak and Scottish Lower (South) Gliding areas which are activated by NOTAM with 2 hours' notice between FL195 and FL245, available to activate at weekends and public holidays.

6.2.200 When activated the Portmoak TRA(G) has a significant effect on routings in and out of the ScTMA to the north rendering existing SIDs, STARS and routes unusable, which ultimately requires aircraft to be tactically vectored around the area. Activation also removes the STIRA hold from use.

6.2.201 In conjunction with the raising of the base levels of TAY CTA 1 and 2, it is proposed to realign the Portmoak and Scottish Low South gliding areas into a single TRA(G) as shown. This proposal facilitates the arrival and departure of oceanic traffic via the JOSSY 1E STAR for Edinburgh Airport as well as the use of the EDONU 1G STAR for Glasgow Airport. In addition, it allows for the continued use of P600 (at higher levels) without tactically altering the filed flight plan routings of aircraft. Availability would remain as per the current arrangements; however, additional activations may be possible with agreement of the MoD.

6.2.202 There are no proposed changes to either the Scottish Lower (North) or Scottish Upper TRA(G)s.

7. Impact of this Proposal

7.1 Fuel and CO_2e

7.1.1 Computer modelling assessed the potential impacts for enabled [31] fuel burn and CO_2e emissions for the proposed system-wide design (NERL design and airports preferred design options, Edinburgh Airport Pre-FOA option 1A&1C and Glasgow Airport option 5, combined) as well as the baseline, do-nothing option per flight up to the FIR boundary. An overview of the Scottish Airspace Modernisation system wide design is included in Annex F. The data is shown in Table 30 for 2027, the planned year of implementation and 2036, 10 years following implementation. It should be noted that a system-wide design that could deliver less benefit in terms of fuel burn and CO_2e emissions remains a possibility, depending on the options progressed by the airport sponsors following consultation. The NERL network design will have no impact on the airport options as these would all join the network at the same location, laterally and vertically. For further information on the methodology used to calculate the Fuel and CO_2e benefits see Appendix C of the Full Options Appraisal (Reference 8).

Year	Without Airspace Change		With Airspace Change		Difference from baseline	
	Fuel (kg)	CO_2e (kg)	Fuel (kg)	CO_2e (kg)	Fuel (kg)	CO_2e (kg)
2027	1,936	6,158	1,912	6,079	-25	-79
2036	1,969	6,260	1,938	6,163	-31	-97

Table 30: Average fuel and CO_2e impacts per flight for the proposed system wide design vs. the do-nothing option.

7.1.2 The data indicates that the option will reduce the average flight plan fuel burn by 25 kg and CO_2e by 79 kg per flight in the implementation year. This will increase to 31/97 kg respectively in 2036.

7.1.3 This represents a total enabled fuel saving in 2027 of 6 kT raising to 8 kT, and a CO_2e saving of 18 kT in 2027 raising to 25 kT in 2036.

7.1.4 In Table 31 and Table 32 the data has been further split into the corresponding airports arrivals and departure traffic. It should be noted that the data is only collected up to a common point between the baseline and option so that a like for like comparison can be made. The implication of this is that there is an apparent discrepancy between the arrival and departure fuel and CO_2e impacts. The departure values are higher than the arrivals as not all arrivals originate within the UK FIR. The Fuel and CO_2e modelling only includes the UK portion of the flight and subsequently most flights in the model will not include an initial climb portion that is fuel expensive.

Year	Edinburgh Arrivals Baseline (kg)		Edinburgh Arrivals Option (kg)		Edinburgh Departure Baseline (kg)		Edinburgh Departure Option (kg)	
	Fuel	CO_2e	Fuel	CO_2e	Fuel	CO_2e	Fuel	CO_2e
2027	1,558	4,953	1,555	4,944	2,461	7,827	2,421	7,700
2036	1,562	4,966	1,553	4,939	2,503	7,960	2,460	7,823

Table 31: Average fuel and CO_2e impacts per flight for the proposed system wide design vs. the do-nothing option for Edinburgh Airport arrival and departure traffic.

[31] An enabled benefit is one that relates to the fuel saving resulting from more efficient flight planned routes. This is not an exact representation of the actual change in fuel burn and CO_2e emissions. The actual impact can only be calculated following implementation of the change. This will allow a direct comparison between the pre-implementation trajectory data and actual trajectory data following the change. This will be provided within the Post Implementation Review of the Airspace Change.

Year	Glasgow Arrivals Baseline (kg)		Glasgow Arrivals Option (kg)		Glasgow Departure Baseline (kg)		Glasgow Departure Option (kg)	
	Fuel	CO_2e	Fuel	CO_2e	Fuel	CO_2e	Fuel	CO_2e
2027	1,373	4,365	1,361	4,329	2,235	7,107	2,180	6,932
2036	1,404	4,466	1,381	4.392	2,226	7,079	2,171	6,903

Table 32: Average fuel and CO_2e impacts per flight for the proposed system wide design vs. the do-nothing option for Glasgow Airport arrival and departure traffic.

7.1.5 The data shows that for all options there will be, on average, a saving for fuel and CO_2e for the design option when compared to the do-nothing option. It should be noted that some routes will have a greater benefit than others. A small portion of the routes may show a disbenefit.

7.1.6 The introduction of this design may result in a small increase in the distances flown for particular routes. However, this data demonstrates that any disbenefit through increased track mileage is offset by improved CDO and CCOs and a more efficient airspace design.

City Pairs- Edinburgh Airport

7.1.7 Indicative fuel/CO_2e values for the top 10 destinations for Edinburgh Airport based on 2023 traffic volume is provided below in Table 33 for the implementation year. These 10 destinations account for 38.9% of Edinburgh Airport traffic. These city pairs do not necessarily represent the 10 most benefited/impacted routes.

	Departures (Fuel/CO_2e) (T)		Arrivals (Fuel/CO_2e) (T)		Total (Fuel/CO_2e) (T)	
airport	baseline	option	baseline	option	baseline	option
Heathrow	9,525/30,288	9,507/30,231	8,427/26,799	8,365/26,600	17,952/57,087	17,871/56,831
Dublin	3,839/12,207	3,577/11,374	2,588/8,231	2,644/8,407	6,427/20,437	6,220/19,781
Stansted	6,853/21,791	6,864/21,828	6,493/20,649	6,463/20,552	13,346/42,440	13,327/42/380
London City	4,209/13,383	4,201/13,359	3,378/10,741	3,360/10.686	7,586/24,124	7,561/24,045
Amsterdam	5,352/17,019	5,145/16,362	2,763/8,786	2,720/8,650	8,115/25,804	7,865/25,011
Belfast International	1,815/5,772	1,803/5,735	2,031/6,460	2,073/6,593	3,846/12,232	3877/12,327
Paris Charles de Gaulle	5,934/18,870	5,942/18,895	4,459/14,181	4,449/14,148	10,393/33,051	10,391/33,043
Gatwick	5,430/17,267	5,431/17,270	4,645/14,772	4,617/14,682	10,075/32,039	10,048/31,952
Bristol	2,886/9,176	2,903/9,231	2,666/8,478	2,653/8,437	5,552/17,654	5,556/17,668
Southampton	1,962/6,240	1,985/6,312	1,923/6,114	1,915/6,089	3,885/12,354	3,900/12,401

Table 33: Fuel and CO_2e impact for the Top 10 city pairs (by volume) for Edinburgh Airport for 2027.

City Pairs- Glasgow Airport

7.1.8 Indicative fuel/CO_2e values for the top 10 destinations for Glasgow Airport based on 2023 traffic volume is provided below in Table 34 for the implementation year. These 10 destinations account for 47.0% of Glasgow Airport traffic. These city pairs do not necessarily represent the 10 most benefited/impacted routes.

	Departures (Fuel/CO_2e) (T)		Arrivals (Fuel/CO_2e) (T)		Total (Fuel/CO_2e) (T)	
airport	**baseline**	**option**	**baseline**	**option**	**baseline**	**option**
Heathrow	7,155/22,752	6,910/21,974	6,833/21,729	6,800/21,623	13,987/44,480	13,710/43,598
Dublin	2,352/7,478	2,265/7,202	1,808/5,748	1,840/5,850	4,159/13,226	4,105/13,052
Gatwick	5,162/16,415	5,051/16,061	4,780/15,202	4,751/15,108	9,942/31,617	9,801/31,169
Amsterdam	4,203/13,365	4,125/13,117	2,297/7,305	2,283/7,259	6,500/20,670	6,408/20,376
London City	3,470/11,034	3,376/10,736	2,765/8,793	2,732/8,689	6,235/19,828	6,108/19,425
Belfast International	1,530/4,866	1,469/4,673	1,208/3,841	1,236/3,931	2,738/8,707	2,705/8,603
Southampton [32]	0	0	0	0	0	0
Bristol	2,934/9,329	2,852/9,071	3,004/9,552	2,991/9,511	5,938/18,882	5,843/18,582
Stornoway	1/2	1/2	766/2,437	717/2,280	767/2,438	718/2,2282
Luton	2,417/7,688	2,317/7,368	2,333/7,421	2,317/7,367	4,751/15,108	4,634/14,735

Table 34: Fuel and CO_2e impact for the Top 10 city pairs (by volume) for Glasgow Airport for 2027.

7.2 Holding

7.2.1 Computer modelling assessed the potential impacts for holding for the proposed system wide design as well as the baseline, do-nothing option per flight. The data shown in Table 35 is for 2027, the planned year of implementation and 2036, 10 years following implementation.

Year	Traffic Flow	Baseline		Option		Difference from baseline	
		% Flights Holding	Average Duration	% Flights Holding	Average Duration	% Flights Holding	Average Duration
2027	EGPF Arrivals	28	00:04:11	19	00:03:19	-9	-00:00:52
	EGPH Arrivals	37	00:03:36	33	00:03:36	-4	00:00:00
2036	EGPF Arrivals	30	00:04:38	18	00:03:13	-12	-00:01:25
	EGPH Arrivals	43	00:04:22	41	00:04:13	-2	-00:00:09

Table 35: Forecast holding for Glasgow Airport (EGPF) and Edinburgh Airport (EGPH) arrivals for the do-nothing and preferred option for year of implementation and implementation +10 years.

7.2.2 The data indicates that the percentage of flights holding as well as the average holding duration is forecast to reduce for both airports. This is attributable to an increase in efficiency of the airspace design increasing capacity. A reduction in holding proportion and time also reduces fuel burn and CO_2e emissions.

7.3 Airspace Capacity

7.3.1 The option proposed herein is anticipated to reduce network constraints on air traffic flows thus increasing capacity and avoiding consequential delay and cost. Whilst this benefit is not easily quantifiable an approximation of the delay cost provides an indication to the scale of the

[32] The forecast provided by Glasgow airport did not include any traffic between Glasgow airport and Southampton airport for 2027 or 2036.

benefit. The quantified Net Present Value (NPV, including fuel)) delay cost, including a discount rate of 3.5% as per the standard rate given in the Treasury Green Book Annex A6, for the baseline, option and difference for the years 2027 to 2036 are shown below in Table 36:

Year	Baseline (£)	Option (£)	Difference (£)
2027	4,090,894	3,100,934	-989,959
2028	4,271,444	3,233,916	-1,037,528
2029	4,435,105	3,354,357	-1,080,748
2030	4,582,813	3,462,955	-1,119,858
2031	4,715,459	3,560,372	-1,155,087
2032	4,833,893	3,647,240	-1,186,652
2033	4,938,924	3,724,162	-1,214,762
2034	5,031,325	3,791,711	-1,239,614
2035	5,111,828	3,850,432	-1,261,396
2036	5,181,133	3,900,845	-1,280,287
Total	47,192,818	35,626,924	-11,565,891

Table 36: Quantified NPV delay costs for the ScTMA airspace change.

7.3.2 The data shows that over the 10 years following implementation, the proposed design is expected to save operators ~£11.6m through the reduction in delays. This will be achieved by improving the efficiency and capacity of the affected airspace.

7.4 Airlines

7.4.1 Overall, the proposed change is expected to yield a positive impact on the operations of commercial airlines. The proposed changes should lead to increased route adherence and enable increased flexibility in flight planning. The introduction of a systemised design should reduce the requirement for ATC tactical intervention, resulting in the trajectories being flown correlating more closely to the flight plan with less delays. The proposed option should enable airlines to achieve a more continuous climb into FRA and improved descent profiles when arriving at the ScTMA airfields leading to reduced operating costs.

7.5 Controlled Airspace Volume and Classification

7.5.1 The proposed update to the ScTMA will involve a considerable change to the existing CAS volumes. This includes redefining the base levels between the airports' CTRs and CTAs with the NERL CTAs and TMAs above them. Due to this redefinition, it may be misleading to discuss the NERL airspace volume in isolation as the NERL volume will be reduced by alterations to airports' CTAs but the CAS volume will remain unchanged. Therefore, it is more informative to consider the airspace as a whole.

7.5.2 This option introduces an entirely new arrival and departure route to the east from ScTMA which will require a significant quantity of new CAS. However, this arrival route in conjunction with the wider ScTMA change should deliver significant benefits including:

- Enabled environmental benefits
  - Reduced fuel burn
  - Reduced CO_2e emissions
  - Reduced land overflight
- Improved safety
- Reduced complexity within the ScTMA airspace
- Improved planning

- Improved efficiency and time keeping of flights.
- Increased network resilience
- Increased access for GA aircraft by reducing the volume of Class A airspace.

7.5.3 The existing ScTMA airspace (including low- level airport changes) below FL195 has a CAS volume of 36,369.8 NM^3. The proposed ScTMA design increases this volume to 37,028.7 NM^3, an increase of ~1.7%. A net increase of 658.8 NM^3.

7.5.4 The additional airspace required for the proposed Firth of Forth connectivity require an additional 1,332.6 NM^3 within the NERL airspace alone. In addition, existing routes and procedures that were not previously contained within CAS are now proposed to be contained, increasing the safety of the airspace. This demonstrates that the ScTMA design has provided a reduction in CAS volume where able.

7.5.5 This has been achieved through an extensive review of the existing requirements and where able the base of CAS has been raised and the utilisation of more accurate routings leading to more efficient airspace utilisation.

7.5.6 In addition to releasing controlled airspace to Class G, substantial Class A airspace, 5,296.2 NM^3 has been re-classified to a lower classification. This re-classification has been enabled through the simplification of the airspace design through systemisation and the relocating of flights from the complex, congested ScTMA airspace into the Firth of Forth connectivity facilitating a more efficient design whilst maintaining safety.

7.5.7 The net airspace volumes (below FL195 to 1 d.p.) for the FASI-N ScTMA update are shown below in Table 37 for airspace classification and in Table 38 for airspace type.

Airspace Classification	Extant Volume (NM^3)	Option Volume (NM^3)	Difference (NM^3)
A	6,714.0	1,417.8	-5,296.2
C		3,713.2	+3713.2
D	1,7691.7	19,307.5	+1615.8
E	11,964.2	12,590.1	+626.0
Total	36,369.8	37,028.7	+658.8

Table 37: Total volume of Airspace in the extant and proposed design split by airspace classification.

Airspace Classification	Extant Volume (NM^3)	Option Volume (NM^3)	Difference (NM^3)
CTR	773.2	737.6	-35.5
TMA	9,467.3	9,512.3	+45.1
CTA	26,129.4	26,778.7	+649.3
Total	36,369.8	36,979.9	+658.8

Table 38: Total volume of airspace in the extant and proposed design split by type.

General Aviation (GA)

7.5.8 GA operates largely, but not exclusively, in uncontrolled airspace below 6,000 feet, alongside a few commercial air transport flights. An exception to this is the gliding community who regularly utilise airspace which may be impacted by this proposal.

7.5.9 The NERL ScTMA project has engaged at all stages with representatives of GA. Focusing on those most likely impacted by the proposed changes (BGA, LAA and local flying clubs) and have requested feedback on proposals as they have been developed.

7.5.10 Addressing this feedback within the ScTMA Design, NERL has raised the bases of CAS where able and lowered airspace classifications to facilitate improved access to CAS for GA.

7.5.11 The Northumbria, Portmoak and Scottish Lower TRA(Gs) are proposed to be amended increasing availability and accessibility to these airspace structures. Outside of gliding, there is expected to be a limited impact on GA and sport aviation airspace users.

7.5.12 NERL has taken the views of all stakeholders into consideration and has attempted, where possible, to accommodate GA stakeholder requests in their key areas of interest. We have endeavoured to release as much CAS as practicable, which has resulted in a significant release of CAS to Class G and re-classified a significant volume of Class A airspace including TAY CTAs 1 and 2 which encapsulate the northern portion of P600.

7.5.13 For an assessment of the impact of the systemwide design on GA please see the CAS commentary within the CAF2 document.

MoD

7.5.14 The NERL ScTMA project has engaged at all stages with the MoD and the proposed NERL design is not expected to have unacceptable impact on MoD operations. The design is dependent on some military SUA boundary changes as described in SUA Updates.

New Entrants

7.5.15 The NERL ScTMA proposed design does not provide any features specifically to enable New Entrant Operations such as Drones, Air Taxis and Space operations. This is due to no requirement for this provision being identified during the previous CAP1616 stages. The proposed change does not prohibit new entrants and new entrants will be able to pursue their own Airspace Changes once a need is identified.

7.6 Safety

7.6.1 The proposed ScTMA design takes advantage of the precise navigation technology available on modern aircraft.

7.6.2 ATC can monitor the track keeping of all aircraft and the trajectory flown should be the same or very close to the flight-planned trajectory (unless controller intervention is required). Hence it should be easier for ATC to identify where an unauthorised deviation from the flight planned trajectory occurs.

7.7 Habitats Regulations Assessment

7.7.1 CAP1616i: Environmental Assessment Requirements and Guidance for Airspace Change Proposals, page 33 provides a Habitats Regulations Assessment (HRA) – Early Screening Criteria. Following this early screening criteria, the changes proposed within this ACP do not require the completion of a HRA as none of the changes proposed within this ACP are in airspace at or below 3,000 ft.

8. Summary of the System-wide benefits of Scottish Airspace Modernisation

8.1.1 The NERL proposal forms part of the wider Scottish Airspace Modernisation proposal along with Edinburgh Airport and Glasgow Airport. The Airspace Change Organising Group (ACOG) have produced the CAF2 document which provides information on how the options presented by the ACP sponsors for consultation work together as a system. This has shown that the overall net cluster-wide benefit (using the Government's method for monetising benefits) is c. £130m over 10years. For a qualitative breakdown of cluster wide benefits see Table 2, and for full details please see ACOG's CAF2 document.

8.1.2 Table 39 below provides an overview of the overall expected Scottish Airspace Modernisation benefits. This table is taken from the ACOG CAF2 document.

Stakeholder Group	Expected Benefits
For local communities	The priority for airspace modernisation at lower altitudes is to limit and, where possible, reduce the total adverse effects of aircraft noise on people. Modernisation is expected to deliver an overall reduction in adverse effects from noise by moving flight paths to where they effect fewer people. However, as this overall benefit can only be achieved by the redistribution of noise between different areas, it may lead to disruption for some communities living under new flight paths.
For the environment	Airspace modernisation is expected to reduce the average environmental impact of each flight in the ScTMA. This is to help the UK to move towards its commitment to net zero emissions while maintaining the aviation sector in Scotland. The Government set out its proposed approach to reach net zero aviation by 2050 in its 2021 Jet Zero consultation and expects a significant proportion of the required emissions reductions will come from improving the efficiency of the existing aviation system, including aircraft, airports as well as airspace.
For airlines	Additional airspace capacity will accommodate predicted growth with less delay, while maintaining and enhancing high levels of safety. Modernisation will also improve flight efficiency, enabling the airlines to capitalise on the performance of their modern fleets of aircraft.
For airports	Modernisation is expected to reduce delays on the ground pre-departure caused by capacity constraints in the airspace and for Glasgow Airport to increase runway throughput during busy periods.
For passengers and the wider economy	Fewer flight delays and service disruptions are expected to save time and improve the passenger experience. The capacity to accommodate predicted growth with less delay will lead to more choice, better value, and enhanced global connections.
For other airspace users	Modernisation offers opportunities for other airspace users to access volumes of airspace that are not required by commercial air transport through the reclassification of unused controlled airspace as uncontrolled, and by more effective airspace sharing.
For the Military	Airspace modernisation will continue to ensure that Military operators have access to suitably sized and sited areas of airspace to fulfil defence and national security objectives, recognising that new Military aircraft and weapons platforms often require larger volumes of airspace in which to train and maintain operational readiness.

Table 39: Replicated table from ACOG's Description of the proposed system-wide design for the Scottish (ScTMA) Cluster of the Airspace Change Masterplan detailing the "Expected benefits of airspace modernisation in the ScTMA organised by stakeholder group."

9. Reversion Statement

9.1.1 In the unlikely event the proposal requires reversal once approved and implemented, permanent reversion to the pre-implementation state would be complex and very difficult due to the significant changes proposed to the airspace structure, the scale of change and the interdependencies between the Glasgow Airport, NERL and Edinburgh Airport airspace changes. Should there be unexpected issues caused by this proposal, then short notice changes could be made via NOTAM or by adding Route Availability Document (RAD) restrictions.

9.1.2 However, if one airspace change is required to revert then it is highly likely that the other two airspace changes would also be required to revert. For a permanent reversion, the changes would have to be reversed by incorporating this into an appropriate future AIRAC date. Large scale airspace changes are implemented a maximum of four times a year due to the lengthy lead times to allow for testing and preparation activities to take place. The feasibility and time for determining reversion would also be influenced by the time needed to update multiple safety critical systems simultaneously alongside the appropriate training of Air Traffic Controllers.

10. Consultation Participation

10.1 How to Respond

10.1.1 The consultation is planned to begin 00:01 on 20 October 2025 and ends at 23:59 on 25 January 2026, a period of 14 weeks.

10.1.2 Consultation material is available on the CAA's airspace change consultation portal at:

- https://consultations.airspacechange.co.uk/nats/sctma

10.1.3 The list of stakeholders targeted for this consultation is given in the Consultation Strategy (Reference 7) Appendix B. These stakeholders have been directly informed of this consultation.

10.1.4 The consultation is not limited to these stakeholders - anyone may respond.

10.1.5 A feedback questionnaire is provided on the consultation portal.

10.1.6 It is recommended (and preferred by the CAA) that responses are made via the portal. A link is also provided from the NATS website (www.NATS.aero).

10.1.7 Please note that when submitting feedback you will be asked to provide the following information:

- Your name, and your role if you are responding on behalf of an organisation
- Your contact details (email)
- A feedback category:
  - SUPPORT NO COMMENT AMBIVALENT OBJECT

10.1.8 Please give your reasons for supporting or objecting to the proposal. (For example: the impacts and benefits it may have on your flights or organisation, and how often you would be affected.)

10.1.9 If this proposal does not affect your operation, please respond, as that fact itself is useful data.

10.1.10 Responses will be publicly visible following moderation by being published on the CAA airspace change portal subsequent to submission, which is in line with CAP1616 requirements.

10.1.11 All responses will be analysed, with any common themes extracted and summarised. NERL will actively monitor the consultation portal and will formally respond back to any queries, alongside including any generic queries under a FAQ section.

10.1.12 A copy of the Consultation questions is included in Appendix C.

10.2 What Happens with the Responses, and What Happens Next

10.2.1 Responses will be managed and uploaded to the consultation portal as appropriate. However, should any responses contain commercially sensitive data then we will redact that information as part of our moderating practice.

10.2.2 On completion of the consultation, we will analyse the feedback and produce a feedback report, summarising themes arising from the feedback, alongside NERL's response to any issues raised. The feedback report will be uploaded onto the consultation portal. Any new requirements identified will be considered in the on-going design process, leading to the production of a formal ACP. The ACP will detail the final design being submitted and make reference to changes that have been made to take account of consultation feedback.

10.2.3 Subject to achieving approval, we plan to implement the final version of this proposal on no sooner than Q1 2027.

11. Appendix A: Glossary

ACOG	Airspace Change Organising Group	ACOG's role is to coordinate the delivery of key aspects of the UK Government's Airspace Modernisation Strategy.
ACP	Airspace Change Proposal	An Airspace Change Proposal is a request from a 'change sponsor', usually an airport or a provider of air navigation services (including air traffic control), to change the notified airspace design.
AFEP	Airspace Flight Efficiency Partnership	A Forum to engage with Airlines on Airspace Change and Flight Efficiency.
agl	Above Ground Level	Vertical distance with reference to the ground.
AIP	Aeronautical Information Publication	A publication issued by or with the authority of a state and containing aeronautical information of a lasting character essential to air navigation.
AMP	Airspace Masterplan	The Masterplan identifies where airspace changes are needed to support the delivery of the Airspace Modernisation Strategy.
AMS	Airspace Modernisation Strategy	The strategy sets out the ends, ways and means of modernising airspace.
amsl	Above Mean Sea Level	Vertical distance with reference to mean sea level.
ANSP	Air Navigation Service Provider	An Air Navigation Service Provider is an organisation that provides the service of managing the aircraft in flight or on the manoeuvring area of an airfield and which is the legitimate holder of that responsibility.
AONB	Area of Outstanding Natural Beauty	An Area of Outstanding Natural Beauty is a designated exceptional landscape whose distinctive character and natural beauty are precious enough to be safeguarded in the national interest.
ATC	Air Traffic Control	Air traffic control is a service provided by ground-based air traffic controllers who direct aircraft on the ground and through a given section of controlled airspace and can provide advisory services to aircraft in non-controlled airspace.
ATCO	Air Traffic Control Officer	Air Traffic Control Officers are personnel responsible for the safe, orderly, and expeditious flow of air traffic in the global air traffic control system.
ATS	Air Traffic Services	An air traffic service (ATS) is a service which regulates and assists aircraft in real-time to ensure their safe operations.
BGA	British Gliding Association	The governing body for the sport of gliding in the UK.
CAA	Civil Aviation Authority	The Civil Aviation Authority oversees and regulates all aspects of civil aviation in the United Kingdom.

CAP1385	CAA Performance-based Navigation (PBN): Enhanced Route Spacing Guidance	Guidelines for the spacing requirements of UK ATS routes.
CAP1616	CAA Airspace Change Process	The CAA's guidance on the regulatory process for changing the notified airspace design and planned and permanent redistribution of air traffic.
CAP1711	CAA Airspace Modernisation Strategy	See AMS.
CAS	Controlled Airspace	Generic term for the airspace in which an air traffic control service is provided as standard; note that there are different sub classifications of airspace that define the particular air traffic services available in defined classes of controlled airspace.
CCO	Continuous Climb Operations	Continuous Climb Operations is an aircraft operating technique facilitated by the airspace and procedures design and assisted by appropriate ATC procedures, allowing the execution of a flight profile optimised to the performance of aircraft, leading to significant economy of fuel and environmental benefits in terms of noise and emissions reduction.
CDO	Continuous Descent Operations	Continuous Descent Operations is an aircraft operating technique in which an arriving aircraft descends from an optimal position with minimum thrust and avoids level flight to the extent permitted by the safe operation of the aircraft and compliance with published procedures and ATC instructions.
CDR	Conditional Route	A Conditional Route is defined as non-permanent ATS route or portion thereof which can be planned and used under specified conditions.
CO_2	Carbon Dioxide	A greenhouse gas produced by burning aviation fuel.
ConOps	Concept of Operations	A document describing the characteristics of a proposed system from the viewpoint of an individual who will use that system.
CTA	Control Area	A control area is a Controlled Airspace extending upwards from a specified limit above the earth.
DAATM	Defence Airspace Air Traffic Management	The DAATM is the MoD focal point for all Defence Airspace policy, including airspace related to the UK Low Flying.
DCT	Direct	(Direct) Waypoint to waypoint routing, which does not use an airway. DCT's are published in the RAD appendix 4.
DfT	Department for Transport	The Department for Transport is the United Kingdom government department responsible for the English transport network and a limited number of transport matters in Scotland, Wales and Northern Ireland that have not been devolved.
DP	Design Principle	The design principles encompass the safety, environmental and operational criteria and strategic policy objectives that the change sponsor aims for in developing the airspace change proposal.

DVOR	Doppler VHF Omnidirectional Range	A Doppler VHF Omnidirectional Range is a ground-based Navigation Aid that allows the airborne receiving equipment to derive the magnetic bearing from the station to the aircraft.
EGPD	Aberdeen Airport	ICAO code for Aberdeen Airport.
EGPF	Glasgow Airport	ICAO code for Glasgow Airport.
EGPG	Cumbernauld Airport	ICAO code for Cumbernauld Airport.
EGPH	Edinburgh Airport	ICAO code for Edinburgh Airport.
EGPK	Glasgow Prestwick Airport	ICAO code for Glasgow Prestwick Airport.
EGPN	Dundee Airport	ICAO code for Dundee Airport.
FAS	Future Airspace Strategy	A forerunner of the AMS.
FASI-N	Future Airspace Strategy Implementation North	An airspace project modernising airspace in the north of the UK.
FIR	Flight Information Region	Flight Information Region (Airspace below FL255).
FL	Flight Level	A flight level (FL) is an aircraft's altitude at standard air pressure (1013 hPa), expressed in hundreds of feet.
FLOPSC	Flight Operations Performance and Safety Committee	An Airports FLOPSC is a committee that deals with the aspects impacting the flight and operational safety at the airport and includes base captain representation for the fleets.
FRA	Free Route Airspace	Free route airspace (FRA) is a specified airspace within which users may freely plan a route between a defined entry point and a defined exit point.
ft	feet	The standard measure for vertical distances used in air traffic control.
GA	General Aviation	All civil aviation operations other than scheduled air services and non-scheduled air transport operations for remuneration or hire. The most common type of GA activity is recreational flying by private light aircraft and gliders, but it can range from paragliders and parachutists to microlights and private corporate jet flights.
GB-0180	Strathaven Airfield	ICAO Designator for Strathaven Airfield.
HoA	Head of Airspace	
hPa	Hectopascal	The Hectopascal is the international unit for measuring atmospheric or barometric pressure.
IAF	Intermediate Approach Fix	The point at which an aircraft begins its approach to the airfield. Typically located at the end of a STAR.
IFP	Instrument Flight Rules	Instrument Flight Rules are rules which allow properly equipped aircraft to be flown under instrument meteorological conditions.

JFADT	Joint Future Airspace Design Team	A collaborative body between NATS and the MoD. JFADT is responsible for the development and coordination of UK National ATM initiatives, including airspace change proposals (ACPs).
kg	Kilogram	The kilogram is the international unit for measuring mass.
LAA	Light Aircraft Association	A NATMAC member representing Light Aircraft users.
LAC	London Area Control	The unit which manages the en-route traffic in the London Flight Information Region. This includes en-route airspace over England and Wales up to the Scottish border.
LOCP	Lead Operator Carrier Panel	A group of the lead operators within UK airspace.
MoD	Ministry of Defence	
MTMA	Manchester TMA	TMA surrounding the Manchester group airports.
NATMAC	National Air Traffic Management Advisory Committee	A group of organisations representing various users of the UK Airspace.
NATS	UK ANSP	The UK's licenced air traffic service provider for the en route airspace that connects our airports with each other, and with the airspace of neighbouring states. Also the air navigation service provider at various UK Airports.
NavAid	Ground-Based Navigation Aid	Published Navigation aid used by aviation.
NERL	NATS En-route Ltd.	See NATS.
NM	Nautical Mile	Aviation measures distances in nautical miles. One nautical mile (NM) is 1,852 metres. One road mile ('statute mile') is 1,609 metres, making a nautical mile about 15% longer than a statute mile.
NP	National Park	A national park is an area set aside by a national government for the preservation of the natural environment.
NSA	National Scenic Area	A National Scenic Area is an area designated in Scotland as having outstanding scenic value in a national context.
OAC	Oceanic Area Control	The unit which manages the en-route traffic within Oceanic Flight Information Region.
OPA	Operational Partnership Agreement	A Forum to engage with Airlines on NATS Operations.
PBN	Performance Based Navigation	Performance Based Navigation is a generic term for modern standards for aircraft navigation capabilities including satellite navigation (as opposed to 'conventional' navigation standards).
RAD	Route Availability Document	The Route Availability Document is a flight-planning document.

RC	Radar Corridor	Radar Corridors are routes that allow aircraft to cross controlled airspace with minimum disturbance to controllers and other aircraft.
ScACC	Scottish Area Control	The unit which manages the en-route traffic within the Scottish Flight Information Region.
ScTMA	Scottish Terminal Manoeuvring Area	TMA surrounding the Scottish group airports.
SFC	Surface	Ground level.
SID	Standard Instrument Departure	A Standard Instrument Departure is a published route with climb for aircraft to follow straight after take-off.
SME	Subject Matter Expert	A subject-matter expert is a person who is an authority in a particular area or topic.
SoN	Statement of Need	The Statement of Need sets out what issue or opportunity an airspace change seeks to address.
SPIG	Safety Performance Improvement Group	A group of SMEs who asses the overall safety and operational implications of changes.
SSR	Secondary Surveillance Radar	The secondary surveillance radar (SSR) is equipment that relies on transponder replies to detect aircraft.
STAR	Standard Arrival Route	A Standard Terminal Arrival Route is a published route for arriving traffic. In today's system these bring aircraft from the route network to the holds (some distance from the airport at high levels), from where they follow ATC instructions (see Vector) rather than a published route. Under PBN it is possible to connect the STAR to the runway via a Transition.
TA	Transition Altitude	The Transition Altitude is the altitude at or below which the vertical position of an aircraft is controlled by reference to altitudes.
TMA	Terminal Control Area	A Terminal Control Area normally established at the confluence of ATS Routes in the vicinity of one or more major aerodromes.
UIR	Upper Information Region	Upper Information Region (Airspace above FL255).
VFR	Visual Flight Rules	A set of rules that govern the operation of aircraft in Visual Meteorological Conditions (conditions in which flight solely by visual reference is possible).

12. Appendix B: Summary of Stakeholder Engagement

12.1 What is not included in this Appendix.

12.1.1 The NERL ScTMA airspace design is the part of the collaborative design work between NERL, Edinburgh Airport and Glasgow Airport to develop a system wide design for the Scottish TMA cluster as defined in the AMS Masterplan.

12.1.2 This has involved an ongoing dialogue between the sponsors with ACOG oversight. Consideration in developing the initial proposed cluster-wide design was given to ensure the design was:

- Safe.
- Implementable (including consideration of whether it was compatible with the surrounding airspace.
- Operationally and environmentally efficient considering all the impacts listed in CAP1616.

12.1.3 The outputs of this work relevant to the NERL ACP are captured within the proposed design described in Section 6. The identification of interdependencies, trade-offs and solutions between ACPs are captured in the CAF1 report in Appendix 3 of the Masterplan Iteration 3 (Scotland) and the collective performance of cluster wide options are presented in the CAF2 report which is included here.

12.2 What is included in this Appendix.

12.2.1 This section summarises the external stakeholder engagement activities conducted between the Stage 2 Gateway and the Stage 3 Submission relating to the ongoing design work.

12.2.2 This engagement has been undertaken to:

- Facilitate the development a system wide design from the option concepts that is:
  - Safe.
  - Efficient.
  - Compatible with the surrounding airspace
  - Implementable.
- Update stakeholders on the progress of the design work.
- Garner assurance that the design direction is reasonable.

12.2.3 Engagement has either been targeted where a design option is known to have an impact on the existing airspace use, or briefings to update stakeholders on the progression of the development work.

12.2.4 The following table lists the engagement activities that have been undertaken as well as a brief description of the aim and outputs of the engagement. Outputs from these meetings were discussed between the sponsors which were impacted and incorporated into the design where able.

Date	Attendees	Aim	Main Design Outputs
06/05/2022	NERL DAATM	Informal Catch up following ScTMA Stage 2 submission.	DAATM briefed on Stage 2 content.
11/05/2022	NERL BGA	NERL to brief BGA on potential impact to Portmoak Gliding area.	Potential positive and negative impacts on gliding activities discussed. NERL Agreed to update Portmoak directly
12/05/2022	NERL EGPD	Discussion of Aberdeen Airports ACP and impact on the NERL ACP.	No impact on NERL ACP by Aberdeen Airport (EGPD) change.
06/06/2022	LOCP	Brief LOCP attendees on progress of the NERL ScTMA design work.	LOCP briefed.
22/06/2022	NERL CAA: SARG	Update CAA on design development work.	None.
24/10/2022	NERL DAATM	Update MoD on current airspace design work.	Potential MoD impacts Discussed and 78 Squadron invited to Development Simulations.
04/11/2022	NERL Portmoak	Portmoak briefing NERL on their current operation. NERL briefing Portmoak on current ScTMA design.	Greater understanding by both NERL and Portmoak of each other's operation.
29/11/2022	NERL EGPD	Update on the ScTMA design for Aberdeen Airport.	Aberdeen Airport updated on ScTMA Design. Making P18 H24 was discussed and will be considered if it can be included within the ScTMA ACP.
08/12/2022	LOCP	Brief LOCP attendees on progress of the NERL ScTMA design work.	LOCP briefed. Additional airline briefings offered 13 and 16 December for airlines to input into simulation designs.
13/12/2022 16/12/2022	LOCP	Detailed ScTMA design discussions for LOCP to feedback into design.	Climb gradients provided by airlines.
13/01/2023	NERL Portmoak	Briefing Portmoak and receive feedback on current ScTMA design.	BGA requested NERL minimises CAS as part of the project. Including narrowing of CTAs. This is not possible due to the requirement for tactical vectoring. BGA requested the Krull hold to be higher and further east, however this would not provide sufficient distance for arriving aircraft to descend. Likewise, the request for STIRA to move south and become left hand was not compatible with the airspace operation. NERLS proposal to remove the N864 CTAs and realign P600 to the east was considered sub optimal and will not be progressed. BGA requested the bases of P600 are raised which will be considered. BGA identified that if the proposed Firth of Forth CAS base was too low, a corridor may be needed to provide GA access. This is outside of the scope of this ACP and would need to be considered by Edinburgh Airport.

Date	Attendees	Aim	Main Design Outputs
16/02/2023	NERL DAATM	Update MOD on current airspace design work.	DAATM highlighted the concern of the cumulative impact of these and the wider impact of airspace change. Requested NERL to brief BAE Warton via DAATM initially with QuinetiQ.
23/02/2023	NERL BAE Warton	Briefing BAE Warton on current ScTMA design.	Design is likely to have a significant impact for BAE Warton around Luce Bay (ROTEV – ROCKY) as well as additional CAS requirements for (ERVIE – TARTN). However, FUA may be possible before 0900 local and after 1800 local (with clawback). BAE Warton are looking at an SUA too.
08/03/2023	NERL Loganair	Briefing Loganair on the proposed design.	Loganair proposed route from Inverness Airport to ASNUD (P600) however outside the lateral limits of the change and would unduly impact the BGA.
16/03/2023	NERL AFEP	Brief AFEP on ScTMA design progress.	AFEP briefed.
30/03/2023	NERL Ryanair	Briefing Ryanair on the proposed design.	Ryanair want to retain the option of taking shortcuts. This is achievable as long as the traffic picture allows it. The descent profile from the south was 4000 ft too low at GIRVA (currently FL170 L GIRVA).
31/03/2023	NERL Airlines (Commercial Pilots Forum)		Airlines would want to retain the option of taking shortcuts. This is achievable as long as the traffic picture allows it. The descent profile from the south was 4000 ft too low at GIRVA (currently FL170 L GIRVA).
31/03/2023	NERL Portmoak	Briefing Portmoak on current ScTMA design.	Portmoak considers holds should not be airspace creators, however CAA policy dictates they need to be contained. A considered new airway connecting inverness to P600 is outside of scope. Portmoak requests bases are raised on P66 and N560. Bases will be raised where able to deliver a safe and efficient airspace design. Moving N864 east is acceptable.
12/05/2023	NERL JFADT	Update JFADT on status of ScTMA design.	JFADT briefed.
25/05/2023	NERL GAA	FASI update to GAA.	GAA briefed.
14/06/2023	LOCP	Briefing LOCP on FASI programme.	No feedback received to incorporate into design.
29/06/2023	NERL DAATM	Discussion of military impacts from routing Glasgow Airport inbounds from the southwest north of the airfield via FYNER, routes east of the TMA and holding.	Agreed that whilst there is a potential impact to the military, mitigations can be developed to enable these options.
14/07/2023	NERL SARG	Briefing SARG on current design.	No outputs leading to design decisions.

Date	Attendees	Aim	Main Design Outputs
09/10/2023	NERL GAA	Updating GAA on ongoing airspace development.	GAA asked if holds will be moving higher and further out. Holds are being reviewed and raised where able. The aim is to reduce holding through airspace modernisation and future system upgrades. No outputs leading to any design decisions
12/10/2023	NERL DAATM	Updating MoD on current design.	MoD Briefed on design updates since June 2023. No outputs leading to any design decisions.
31/10/2023	NERL EGPH EGPF ACOG CAA	Update CAA on design progress.	Confirmed NERL is assuming FRA will be implemented prior to ScTMA update and only a single design will be consulted on. No outputs leading to design decisions.
08/11/2023	NERL Airlines	NATS OPA	General update on ongoing airspace projects. No feedback leading to design updates received.
09/11/2023	NERL Airlines	NATS AFEP	General update on ongoing airspace projects. No feedback leading to design updates received.
06/12/2023	NERL Industry Specialists	LOCP	No outputs leading to design updates.
21/12/2023	NERL EGPH ACOG	Discussion surrounding STRAT SID.	Some modification to the low-level airport design. No impact expected to NERL design.
31/01/2024	NERL GAA BGA	Update GAA/ BGA.	No outputs leading to updates of the NERL design.
08/02/2024	NERL DAATM	Updating MoD on current design.	MoD Briefed on design updates since June 2023. No outputs leading to any design decisions.
01/03/2024	NERL EGPH EAI	Discussion on proposed climb gradients for departures.	Proposed climb gradients on SIDs may need to be revisited. Impact on design will be assessed.
14/03/2024	NERL DAATM	Updating MoD on current design.	MoD Briefed on design updates since February 2024. No outputs leading to any design decisions
09/05/2024	NERL DAATM	Updating MoD on current design.	Leuchars will provide feedback but requested briefing. No outputs leading to any design decisions.
24/05/2024	NERL GAA BGA	Update on progress of FASI deployments	No outputs leading to any design decisions.
24/05/2024	NERL BAE Warton	Briefing on changes that may impact the BAE Warton operation.	No outputs leading to any design decisions.

Date	Attendees	Aim	Main Design Outputs
30/05/2024	NERL EGAA EGAC	Briefing on changes that may impact the Belfast TMA operation.	Concern raised that raising the Strangford CTAs may impact the Belfast TMA traffic. Follow up meeting planned 05/06/2024.
05/06/2024	NERL EGAC	Discussions of concerns raised by Belfast regarding base level of Strangford CTAs.	Strangford CTA12 will retain the existing base level due to the constraints placed on traffic for the Belfast TMA.
05/06/2024	NERL EGNT	Briefing Newcastle Airport of proposed changes.	No impacts on Newcastle Airport traffic therefore no outputs leading to any design decisions.
06/06/2024	NERL LOCP	Update on progress of FASI deployments.	No outputs leading to any design decisions.
18/06/2024	NERL EGPH Leuchars	Briefing of NERL and Edinburgh design proposals in order to obtain technical, operational feedback from an affected stakeholder	No outputs leading to any design decisions.
25/06/2024	NERL Ryanair United	Engagement regarding airline operations with the ScTMA design and CAGVE operations.	No outputs leading to any design decisions.
27/06/2024	NERL EGPF EGPK	Briefing of NERL and Glasgow design proposals in order to obtain technical, operational feedback from an affected stakeholder	No outputs leading to any design decisions.
08/07/2024	NERL EGPH EGPN Leuchars	Briefing of NERL and Edinburgh design proposals in order to obtain technical, operational feedback from an affected stakeholder	No outputs leading to any design decisions.
22/07/2024	NERL EGPD	Briefing of NERL on design proposals in order to obtain technical, operational feedback from an affected stakeholder	No outputs leading to any design decisions.

13. Appendix C: Consultation Questionnaire

About you

1) What is your name? (Required)

2) What is your email address? (Required)

3) Please enter your postcode (most relevant to your response home/ work/ organisation etc). UK only - if responding from outside the UK please complete the next question instead

4) If responding from outside the UK, please supply an address or location description.

5) Who are you representing? (Required)
   a. I am responding as an individual
   b. I am responding on behalf of an organisation.

6) Please note all responses will be published. Are you happy for your name to be included in the response publication? (We will not publish email addresses)
   a. Yes- I want my response to be published with my name.
   b. No- I want my response to be published anonymously.

   If NERL identifies that your response may impact one or both of the Scottish Airspace Modernisation Airports during our collation and analysis of responses, we will share your response with the appropriate sponsor(s) in full. Should the appropriate sponsor confirm your response is relevant, and that they had not received the response from you directly, they will publish your response on their citizen space page, with or without your name, depending on your answer to the question above.

Organisation Details (Only if answer this section if you answered option b to question 5)

7) What is your organisation name?

8) What is your position/title?

Your Feedback

9) To what extent do you support or object to the airspace changes described in this proposal?
   a. Support- I support the changes
   b. No Comment- I neither support or object
   c. Ambivalent- I have mixed feelings
   d. Object- I object to the proposed changes
   e. Not answered

10) To what extent do you agree or disagree that the proposed option modernises the ScTMA Network design?
    a. Strongly Agree
    b. Agree
    c. Neutral
    d. Disagree
    e. Strongly Disagree
    f. Don't know

    Please provide a rationale

11) To what extent do you agree or disagree that the environmental benefits achieved due to the proposed new Firth of Forth connectivity justifies the Controlled Airspace (CAS) requirements to the east of the ScTMA?

    For Further information on the environmental Benefits, please see Sections 7.1 and 7.7 of the Consultation Document.
    a. Strongly Agree
    b. Agree
    c. Neutral
    d. Disagree
    e. Strongly Disagree
    f. Don't know

    Please provide a rationale

12) To what extent do you agree or disagree that that the proposed airspace classifications for Terminal Control Areas (TMAs) and Control Areas (CTAs) are suitable to the airspaces' proposed use?

    For further information on the proposed CAS see the Controlled Airspace (CAS) section of the Consultation Document (6.2.80 - 6.2.176)
    a. Strongly Agree
    b. Agree
    c. Neutral
    d. Disagree
    e. Strongly Disagree
    f. Don't know

    Please provide a rationale

13) To what extent do you agree or disagree that the proposed airspace volumes are sufficient to deliver a safe and efficient Air Traffic Service (ATS)?

    For further information on the proposed CAS see the Controlled Airspace (CAS) section of the Consultation Document (6.2.80 - 6.2.176)
    a. Strongly Agree
    b. Agree
    c. Neutral
    d. Disagree
    e. Strongly Disagree
    f. Don't know

    Please provide a rationale

14) To what extent do you agree or disagree that the proposed airspace will have a net beneficial impact on general aviation airspace users (due to improved access to sport areas)?

For further information on the GA impact see sections 7.5.8-12 of the Consultation Document.

a. Strongly Agree
b. Agree
c. Neutral
d. Disagree
e. Strongly Disagree
f. Don't know

Please provide a rationale

15) Do you agree or disagree with our assumptions on climb and descent gradients used to assign Free Route Airspace (FRA) Arrival and Departure Points? Please select one option for Arrivals and one option for Departures.

Departure routes have been designed using a 7% climb gradient and arrival routes have been designed using 3° descent gradient.

a. Arrival Gradients Agree
b. Arrival Gradients Disagree
c. Arrival Gradients Don't Know
d. Departure Gradients Agree
e. Departure Gradients Disagree
f. Departure Gradients Don't Know

Please provide a rationale

16) If you have any feedback on the system wide proposal, please use the box below to give us your thoughts:

The NERL Airspace Change Proposal (ACP) forms part of a wider project to modernise Scottish Airspace. As part of the development of the ACP, we have worked with Edinburgh Airport and Glasgow Airport to design the system wide airspace. More information can be found here (Annex F).

Please provide a rationale

17) If you have any other comments on the NERL proposal, please provide your feedback here

MoD

18) Were you answering on behalf of the MoD?
    a. Yes
    b. No

MoD Questions

19) Does the MoD agree or disagree with the proposal to redefine the lateral dimensions of the Temporary Reserved Areas (TRAs) as set out within the consultation document and thereby facilitate new ingress and egress routings for the ScTMA with associated environmental benefits as a result?
    a. Agree
    b. Disagree
    Please provide a rationale

20) Does the MoD agree or disagree with the proposal to redefine the lateral dimensions of EG D514 and thereby facilitate a permanent access routing to the north of Edinburgh, noting the Flexible Use Airspace principle of conditionality for the Firth of Forth ingress and egress routings subject to EG D514 activation?
    a. Agree
    b. Disagree
    Please provide a rationale

21) Does the MoD agree or disagree with the airspace access arrangements proposed for Leuchars, the details of which will be set out in an Letter of Agreement (LOA) between Units?
    a. Agree
    b. Disagree
    Please provide a rationale

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