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Future Combat Airspace, ACP-2020-026

STAGE 3 Consultation

Stage 3A Consultation Document



Version 2.0

References

Ref no.	Description	Hyperlink
1	Stage 1 Statement of Need	Link to document
2	Stage 1 Assessment Meeting Minutes	Link to document
3	Stage 1 Design Principles	Link to document
4	Stage 2 Design Options	Link to document
5	Stage 2 Design Principle Evaluation	Link to document
6	Stage 2 Initial Options Appraisal and Safety Assessment	Link to document
7	Stage 3 Consultation Strategy	Link via Citizen Space
8	Stage 3 Full Options Appraisal	Link via Citizen Space
9	Airspace change: Guidance on the regulatory progress CAP 1616	Link to document
10	UK Government Department for Transport's 2017 Guidance to the CAA on its environmental (abbreviated to ANG2017)	Link to document
11	ACP-2020-042 Future Combat Airspace Trial	Link to document
12	ACP-2021-007 Future Combat Airspace Interim Solution	Link to document

Roles

Action	Role	Date
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2.0	10 Jan 23	Terminology within document amended throughout Diagrams amended throughout Previous design iterations replaced with hyperlink to CAA Airspace Portal Section 3.5 Greater consistency provided regarding Danger Area Activation Table Section 5.4 Further detail on current-day scenario and civil airspace activity Section 6 Enhanced detail regarding environmental analysis Section 7

Contents

<i>Glossary of Terms</i>	6
<i>Executive Summary</i>	7
Section 1 - Context	
1.1 Introduction and Overview	8
Section 2 - The Airspace Change Process	
2.1 The Airspace Change Process	11
2.2 Stakeholders	12
2.3 Scope of Consultation	13
Section 3 - Summary of Airspace Design Development	
3.1 Design Principles	15
3.2 Airspace Design Options Summary	15
3.3 The Need for Airspace Change	16
3.4 Preferred Base Level and Lateral Extent	16
3.5 Previous Design Iterations	16
Section 4 - Preferred Airspace Design Option	
4.1 Creation of a New (preferred) Danger Area	17
Section 5 - Operating Principles	
5.1 Measures to Minimise the Impact on Other Airspace Users	19
5.2 Utilisation of Airspace	19
5.3 Lateral Position Requirements	20
5.4 Danger Area Activations	20
Section 6 - Baseline Airspace Activity	
6.1 Current Day Scenario and Civil Airspace Activity	21
6.2 Newcastle International Airport	23
6.3 General Aviation Activity	25
6.4 Gliding Areas	27
Section 7 - Enroute Analytics and Environmental Analysis	
7.1 Air Traffic Sampling	29
7.2 Effect on Aviation	29
7.3 Environmental Impact	32
7.4 Average Results	34
7.5 Annual Environmental Impact	34

Section 8 - Consultation Process

8.1	Consultation Duration	35
8.2	What is Being Asked?	35
8.3	How to Respond	35
8.4	Next Steps	36

Glossary of Terms

ACP	Airspace Change Proposal
ACT	Air Combat Training
AAL	Above Aerodrome Level
ACT	Air Combat Training
AMSL	Above Mean Sea Level
ANO	Air Navigation Order
AONB	Area of Outstanding Natural Beauty
AQMA	Air Quality Management Area
ARP	Aerodrome Reference Point
ASM	(Defence) Airspace Management
ATC	Air Traffic Control
ATS	Air Traffic Service
ATZ	Aerodrome Traffic Zone
BVLOS	Beyond Visual Line of Sight
CAA	Civil Aviation Authority
CAP	Civil Aviation Publication
CTA	Control Area
CTR	Control Zone
DIO	Defence Infrastructure Organisation
DP	Design Principle
FBZ	Flight Plan Buffer Zone
FL	Flight Level
FIR	Flight Information Region
FUA	Flexible Use of Airspace
ISTAR	Intelligence, Surveillance, Target Acquisition and Reconnaissance
LFE	Large Force Exercises
LoA	Letter of Agreement
MAA	Military Aviation Authority
MATZ	Military Aerodrome Traffic Zone
MOD	Ministry of Defence
MRP	Military (Aviation Authority) Regulatory Publication
NOTAM	Notice to Airmen
NVGs	Night Vision Goggles
QRA	Quick Reaction Alert
RA	Regulatory Article
RAF	Royal Air Force
SoN	Statement of Need
SID	Standard Instrument Departure
STAR	Standard Arrival Route
SQN	Squadron
SUA	Special Use Airspace
TMA	Terminal Control Area
TRA	Temporary Reserved Area
USAFE	United States Air Forces in Europe
VLOS	Visual Line of Sight

Executive Summary

This Consultation Document contributes towards Stage 3 of the Civil Aviation Publication (CAP)1616 Airspace Change Process for ACP-2020-026, which aims to facilitate the usage of *Future Combat Airspace* (FCA) by the United Kingdom and coalition partners during infrequent but planned large scale, highly complex training exercises that are used to prepare aircrews for operational environments.

ACP-2020-026 has successfully completed Stage 1 (Define) and Stage 2 (Develop and Assess) of the seven-stage process defined by CAP1616. Supporting documentation can be found on the Civil Aviation Authority, *Airspace Change Portal*. The requirements for Stage 3A, Consultation Preparation include:

1. The production of a Consultation Strategy detailing the scale, nature, and timescales of the proposed consultation.
2. Produce a Consultation Document (*this document*) that allows all Stakeholders (including those with no technical expertise) to understand the proposed changes.
3. Produce an Options Appraisal (Phase II – Full) identifying potential impacts and mapping affected Stakeholders.

Public consultation for ACP-2020-026 will be 13 weeks in duration, in accordance with CAP1616 and as agreed within the [updated timeframe](#).

Stage 3 - Consultation, is aimed at reaching as many Stakeholders as possible, as early in the process as possible, with regular reminders. The Sponsor will:

- Prepare a single Consultation Document, suitable for all Stakeholders to understand, interpret and to comment upon.
- Consult directly with those aviation Stakeholders that have been identified and have participated in the initial Stakeholder engagement at Stage 1 and Stage 2.
- Offer a combination of both face-to-face and online briefing events as agreed with Stakeholders once consultation commences.
- Contact members of any Stakeholder groups who have not responded after 6 weeks to remind them of the deadline for consultation.
- Review and analyse the consultation responses and complete a Consultation Feedback report.

Section 1 – Context

1.1 Introduction and Overview. The Ministry of Defence (MOD) is the Sponsor for this proposal. The aim of this proposal is to secure Future Combat Airspace, for use by the UK and coalition partners during occasional large scale, highly complex training exercises that are used to prepare aircrews for operational service. This proposal complies fully with the strategic aim as laid down in Annex C of CAP740. The [Statement of Need](#) for this Airspace Change Proposal (ACP) is available through open-source access.

“The strategic aim for Defence Airspace Management (ASM)¹ is to enable all arms of Defence to ‘train as they would fight’ by safeguarding long term access to appropriately sized and sited airspace, which can be reserved for hazardous activities, whilst minimising the impact on other airspace users.”

Although the UK *Joint and Integrated Approach* encourages sharing of airspace rather than segregating, MOD firmly believes that in the case of Large Force Exercises (LFE) exercises (more than 10 aircraft simultaneously participating) segregation and suitable notification is the only safe method of Defence ASM, hence this Airspace Change Proposal.

This Consultation is for the creation of a new Danger Area in which military exercises involving large numbers of different aircraft types can train for operations. The MOD is the Sponsor of this ACP which proposes a change to the design of UK airspace. This is not a planned and permanent redistribution of air traffic within the definition of the CAP1616.

CAP 1430² refers to a ‘Danger Area’ as airspace of defined dimensions within which activities dangerous to the flight of aircraft may exist at specified times.

Existing Danger Areas, although suitable for routine flying training are of insufficient volume for modern military flying and the execution of large force exercises. New aircraft types, weapons and tactics used by the Royal Air Force and coalition partners requires appropriately sized areas to conduct beneficial training.

Due to high energy manoeuvres and unpredictable changes in heading and level taken by aircraft participating in operational training, the airspace in which training is conducted should be segregated and notified to ensure that safety is not compromised.

As per trial activations (most recently under ACP-2021-048), the proposed Danger Area would be published in the Aeronautical Information Publication (AIP), but only activated for specific periods. These activations would notionally be for defined time periods and on specified days, in which significant notice should be provided to all Stakeholders.

¹ Airspace Management [Airspace management \(ASM\) | EUROCONTROL](#)

² [CAP1430: UK Air Traffic Management Vocabulary \(caa.co.uk\)](#)

Safety is the highest priority and it is envisaged that activations would be managed through the Military Airspace Management Cell (MAMC) with a Flight Plan Buffer Zone (FBZ) enforced to enhance safety for all airspace users who intend to use the route network. Participants will adhere to airspace sharing procedures by notifying any changes or cancellations to the proposed activation.

Based on the airspace design employed during previous activations the preferred design will ensure that access to airways is maintained and that portions of sensitive airspace are avoided. Where direct routes are affected by the activation of the Danger Area, it is planned that a Letter of Agreement will cover alternate options to re-routed traffic, it is envisaged that this procedure will be published and agreed in advance with all parties. Alternative reporting points would be utilised if the preferred design option was active.

Those international airports which may be affected by this proposal are Aberdeen, Edinburgh, Dundee, Newcastle, and Teesside.



Figure 1 – Approximate lateral area of interest of the preferred design

Within this consultation we describe the current (no change) situation and the preferred option for airspace change.

The preferred option seeks to establish a Danger Area, from Flight Level (FL) 85 to FL660 with a lateral extent of 90 x 160 nautical miles (nm). The approximate area for the proposal is shown in Figure 1. If the Sponsor were to do nothing, the safety of

both civilian and military aircraft would potentially be compromised, and any further mitigations introduced would diminish the overall training value offered by the exercises.

We have described the 'no-change' option as a baseline for comparison between the preferred option and what happens at present, so that you can determine if you are likely to experience a change.

Consultation is an essential part of the airspace change process. It allows the Sponsor to explain the proposal in a fair, transparent, and effective way, and gather information to understand views about the impact of the options presented. It allows Stakeholders to provide relevant and timely feedback to the Sponsor, which can then be used to inform the final proposal.

The Consultation will start on 6 February 2023 and will last until 8 May 2023. *A period of 13 weeks – with an additional week to allow for Easter 2023.*

A formal proposal will then subsequently be submitted to the Civil Aviation Authority.

If approved by the CAA, the change will be implemented to align with AIRAC 02/2024.

Section 2 – The Airspace Change Process

All proposals for airspace change are regulated by the Civil Aviation Authority (CAA). The Sponsor of an airspace change must follow the process set out in the CAA's guidance on the Regulatory Process for changing the notified airspace design CAP1616 (Ref 9). This document forms part of the document set required for Stage 3 (Consult) of the CAP1616 Airspace Change Process. Its purpose is to present clear information about the airspace options the Sponsor is consulting upon and the potential impact the proposed change may have on you.

This Consultation Document explains the history, impacts and benefits of the proposal. There are two complementary documents available, providing more details on how the options were appraised and how this Consultation will be conducted:

- Stage 3 - *Consultation Strategy*, which provides details on how the Sponsor will conduct the consultation, Reference 7.
- Stage 3 - *Full Options Appraisal*, which provides analysis of the evidence for the proposed airspace in relation to the baseline, Reference 8.

2.1 The Airspace Change Process. This proposal is at Stage 3 in the seven-stage process. Stage 1 is the “define” stage, where the Sponsor published a [Statement of Need](#) setting out the issue they are seeking to address. The Sponsor then established Design Principles, which were developed through engagement with Stakeholders. These Design Principles form a qualitative structure against which design options can be evaluated.

Stage 2 - Develop and Assess has also been completed, where the initial option was developed and evaluated against the Design Principles from Stage 1, an initial appraisal of the option was performed. This crucial stage of the Airspace Change Process explained why unsuitable options were not considered and presented an option which aligned with the Design Principles.

All published documents submitted during Stage 1 and Stage 2 can be viewed on the open source [Airspace change portal \(caa.co.uk\)](https://caa.co.uk/airspace-change-portal).

The design option which has progressed to Stage 3 is assessed by the Sponsor as viable and would provide suitable airspace for military training. The proposal is now at the Consult stage, where Stakeholders are asked for their feedback.

The flowcharts below illustrate the airspace change process as described in CAP1616, with a specific extract from Stage 3 - Consult.

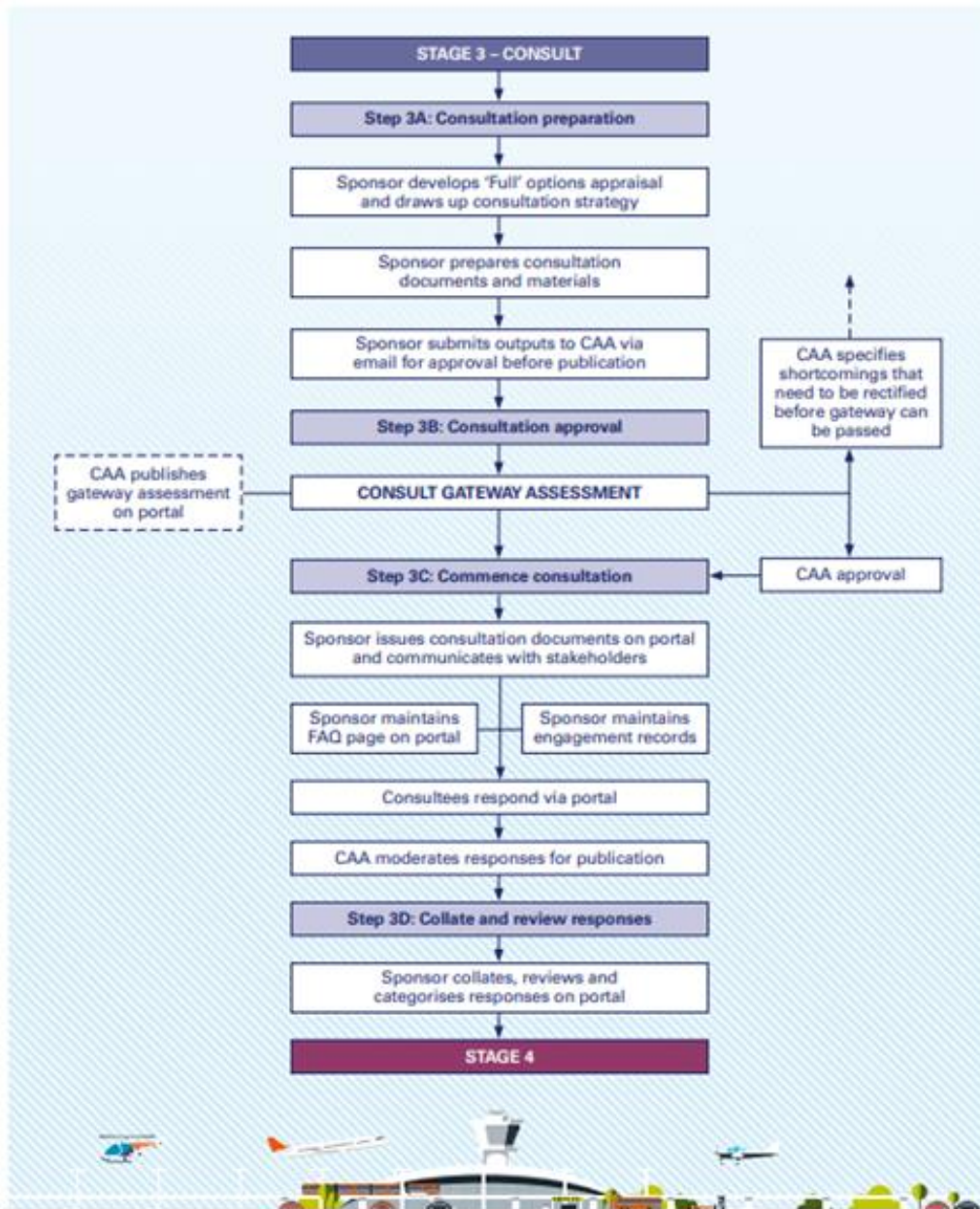


Figure 2, Stage 3 – Consult, specific requirements (extracted from CAP1616)

2.2 Stakeholders. A Stakeholder is a third party with an interest in or is likely to be affected by the proposal. If you are reading this document, it is likely you are a Stakeholder.

Many Stakeholders have been identified early in the process and are listed in the Consultation Strategy at Reference 7.

2.3 Scope of Consultation. The design preferred by the Sponsor is based upon a Temporary Danger Area which has safely and successfully been utilised previously for Large Force Exercises, most recently under ACP-2021-048.

A fundamental aim of the consultation is to determine the effects to air traffic below 7000 feet (above mean sea level) (AMSL) and whether this proposal will result in a change to aircraft patterns below this altitude over an inhabited area. Should it be shown that there is the potential for this to be the case then the proposal shall be categorised accordingly – this proposal has been deemed to be a level M1 submission, but with a scaled approach to consultation (Figure 3 provides this detail).

<p>Level 1: High impact* changes to notified airspace design A change that does have the potential to alter traffic patterns below 7,000 feet over an inhabited area¹</p>	<p>Level 2: Medium to low impact* changes to notified airspace design A change that does not have the potential to alter traffic patterns below 7,000 feet over an inhabited area¹</p>
<p>The Government's Air Navigation Guidance states that below 7,000 feet is the maximum height at which noise is a priority for consideration</p>	
<p>Level 1: Typically a large-scale change which alters lateral aircraft tracks or dispersion, or changes aircraft height, below 7,000 feet (above mean sea level) over an inhabited area¹, such as:</p> <ul style="list-style-type: none"> • changes to departure and arrival routes at airports • changes which have a significant impact on other aviation stakeholders 	<p>Level 2A: Typically a change which alters aircraft tracks, or changes aircraft height, below 20,000 feet (above mean sea level) but at or above 7,000 feet (above mean sea level), such as:</p> <ul style="list-style-type: none"> • changes to AirTraffic Service (ATS) routes • establishment of new controlled airspace below 20,000 feet (above mean sea level). <p>Level 2B: Typically a change:</p> <ul style="list-style-type: none"> • to controlled airspace that occurs over the sea or at 20,000 feet (above mean sea level) and above, or • outside controlled airspace at or above 7,000 feet (above mean sea level) <p>Level 2C: Typically a change which reflects:</p> <ul style="list-style-type: none"> • the current use of the airspace concerned, such as a DCT*** to ATS Route, or • the removal of established airspace structure (such as Standard Instrument Departure truncation) <p>and which does not alter traffic patterns below 7,000 feet (above mean sea level)</p>
<p>Level 0: Changes to nomenclature or qualifying remarks** of the notified airspace design A change that will not alter traffic patterns Also applicable to the establishment of, or changes to, Visual Reference Points</p>	<p>Level M: Changes to notified airspace design by Ministry of Defence</p> <p>Level M1: a proposed change where an anticipated consequence is an alteration of civil aviation traffic patterns below 7,000 feet over an inhabited area¹</p> <p>Level M2: a proposed change where the anticipated consequences are either (a) an alteration of civil aviation traffic patterns at 7,000 feet or above, or (b) no impact on civil traffic</p>

Figure 3, Scaling of Airspace Change Proposals (extracted from CAP1616)

Consultation aims to establish the impact this proposal has on civil aviation activity in the vicinity. By setting the base of the preferred design at FL85 and sympathetically designing the lateral extent of the Danger Area to avoid main arrival and departure tracks, the Sponsor assumes that Standard Instrument Departures (SIDs) and Standard Arrival Routes (STARs) of identified Stakeholders remain unaffected when the Danger Area is active. It is also hoped that Visual Flight Rules (VFR) traffic is unaffected by the Danger Area, given its relatively high base level and lateral position (which is mainly over the North Sea).

This proposal aims to activate the preferred airspace option for large force exercises only, giving significant advanced notice of dates and times of activation. The Consultation aims to determine the level of impact at different times throughout the year, the associated Consultation Questionnaire (available through Citizen Space) seeks this detail, and the Sponsor is mindful of the need to work closely with all Stakeholders.

There are several Danger Areas used by the MOD, these can be referenced at [ENR-5-1 Prohibited, Restricted and Danger Areas Civil AIP](#). This Consultation aims to establish deconfliction protocols for the activation of these areas in relation to the preferred option associated with ACP-2020-026.

The airspace on which this proposal is based has been designed to avoid other sensitive airspace structures and maintain connections between airports and airways. The Consultation will assess whether any changes to the design would be beneficial in minimising the impact on civil routes and potentially reducing carbon dioxide emissions.

Air Navigation Service Providers (ANSPs) will be approached directly to assess whether the change proposed would result in additional training or infrastructure costs and, where possible, monetise the likely cost. This information will then be annotated in the Full Options Appraisal.

In accordance with CAP1616, environmental impact as a direct result of military aircraft does not need to be assessed. However, consequential environmental impacts from other users as a result of the change, needs to be appropriately considered. Nevertheless the Sponsor would like to emphasise that the RAF has an ambitious target to achieve Net Zero by 2040 and is therefore extremely conscious that scarce resources are employed in the most sustainable manner, there is a Defence desire to increase the use of simulators, however the current level of fidelity does not yet exist in order to replicate realistic large-scale scenarios in the synthetic environment – hence this consultation for the establishment of a new Danger Area.

Section 3 – Summary of Airspace Design Development

3.1 Design Principles. Post Stakeholder feedback, the MOD established a set of Design Principles (DPs) during Stages 1 and 2 of the ACP. These principles have been used to assess the validity of a set of initial airspace design options and has enabled the Sponsor to refine the design options accordingly.

Priority	Design Principle
1	DP(a) The airspace design must be safe, with any hazards identified and risks mitigated such that they are as low as reasonably practicable and tolerable.
2	DP(b) The training area will be within efficient reach of RAF / United States Air Force (Europe) (USAFE) Main Operating Bases. DP(c) Optimise the airspace design to accommodate periodic large-scale multi-domain collective training activities. DP(e) Minimise impact on other airspace users and the network.
3	DP(h) Minimise the impact to Commercial Air Traffic flow, sector complexity and sector capacity. DP(g) Minimise environmental impacts including CO2 emissions. DP(f) Minimise environmental impacts including noise (where relevant).
4	DP(d) Optimise Airspace Management (ASM) applying Flexible Use of Airspace (FUA) principles and ASM Policy
5	DP(j) Minimise complexity in flight planning. DP(i) Optimise protocols for deconfliction of simultaneous activations of multiple volumes of Special Use Airspace. DP(k) Maximise the incorporation of results of the MOD's supporting Airspace trial – ACP-2020-042.

3.2 Airspace Design Options Summary. The below table summarises the design options considered. Although there is only one preferred option alongside the 'do-nothing' option, the Sponsor has considered and eliminated several previous options which do not align with the Statement of Need or satisfy the requirements of the Stakeholders. The 'do-nothing' option is described for use as a baseline and is not considered by the Sponsor to be the preferred option.

	Option	Description
0	Baseline	The "do nothing" option. Keep everything as it is currently, continue to use existing MDAs. Large Force Exercises will still take place but use MDAs and existing Class G/C airspace.
1	Create new SUA with overland portion.	Create new Special Use Area, predominantly positioned in high seas airspace with overland portions on which ground threats and targets can be positioned.

3.3 The Need for Airspace Change. The current Danger and Military Training Areas are not suitable for Large Force Exercises; these exercises routinely involve more than 10 aircraft. These exercises are essential in order to prepare aircrews for the operational environment.

Should the exercise participants spill outside of the Danger Area they must be controlled by a tactical unit. These tactical units can only control 8 aircraft at a time meaning that numbers involved in the exercise would have to be reduced. If a control service cannot be provided, aircraft would have to remain in Class G/Class C (within an active TRA) airspace up to FL245. Modern aircraft weapons and tactics require manoeuvre and weapon release above this level. This restriction would result in crucial training serials being unavailable.

Furthermore, training against the threat of Surface Based Air Defence Systems (SBAD) cannot take place below FL245 due to the modern methods required. Many of the training objectives carried out during these live exercises cannot currently be completed in the simulator. There are longer term aspirations to increase the usage of simulators – unfortunately at present this technology does not exist.

The Royal Air Force's mission is '*to defend the skies of Britain and project Britain's power and influence around the world.*' RAF aircrew require realistic and high intensity training to maintain and develop their skills, therefore 'doing nothing' is not the preferred option.

3.4 Preferred Base Level and Lateral Extent. To facilitate multi-domain³ collective training the airspace must be of the appropriate dimensions for the aircraft to operate as they would during peer-peer combat operations. For modern aircraft this requires lateral dimensions of at least 90nm x 160nm, vertical dimensions required are from FL85 to FL660.

The design for the lateral limits was created in consultation with Stakeholders, this design aims to minimise impact on Stakeholders, yet maximise the suitability and efficiency of the preferred design option.

3.5 Previous Design Iterations. The Sponsor did investigate the expansion of other existing Managed Danger Areas (MDAs) and Military Training Areas (MTAs), a summary of these can be found at Stage 2 Initial Options Appraisal and Safety Assessment [link here](#).

³ Multi domain training involves operating alongside Sister Services. In the modern environment it also incorporates Cyber and Space elements.

Section 4 – Preferred Airspace Design Option

4.1 Creation of a New Danger Area

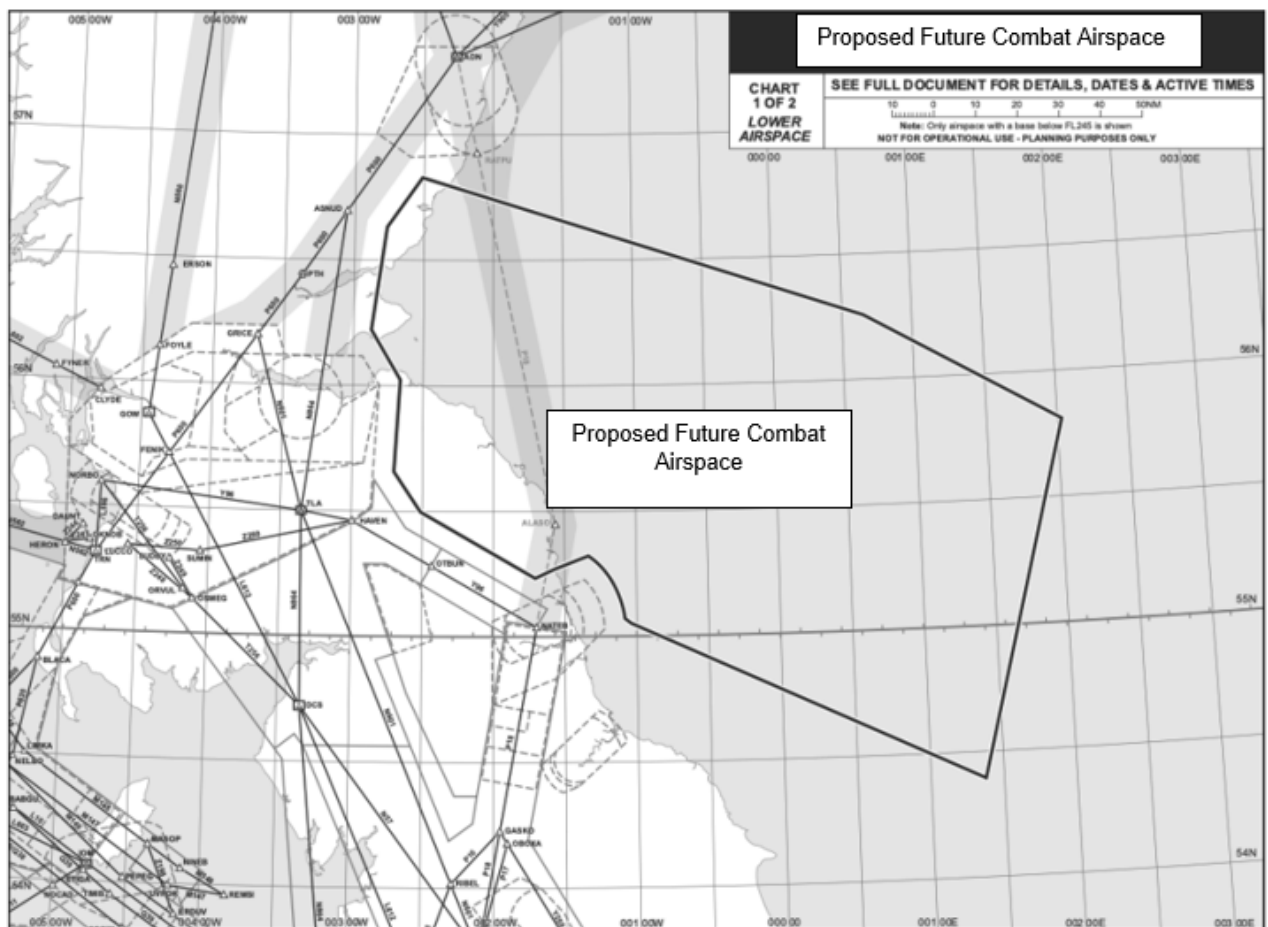


Figure 4 – Preferred Airspace Design Option Diagram extracted from AIP Supplement 049/2022, dated 28 July 2022

Our proposal is for a permanent segregated portion of airspace, situated towards the Northeast of the UK and activated in support of Large Force Exercises. Minimum dimensions required are 90nm x 160nm and from FL85 to FL660, predominantly based over the sea but with an overland portion on the shortest edge. Following feedback from Stakeholders, it is clear that it should avoid sensitive airspace and allow all airports connection to airways. The main question from Stakeholders related to the frequency of activations, because of their concerns, MOD proposes activations for the shortest possible durations and only for planned large scale exercises, feedback is sought from Stakeholders on this matter

The selection of this geographical area considers current aerial activity and the location of nearby airways. This area satisfies the Statement of Need with regards to the requirement to be within flying distance of RAF bases without having to cross busy portions of airspace and is within reasonable distance of a suitable number of diversion airfields, most of the airspace is over the high seas and therefore is suitable for supersonic flight.

MOD presents only one preferred option for this ACP; however this document aims to satisfy Stakeholders that it aligns with all Design Principles, previous engagement feedback has been acted upon and that alternate options have and still will be considered by the Sponsor during consultation.

Section 5 – Operating Principles

5.1 Measures to Minimise the Impact on Other Airspace Users. It is envisaged that the following measures will be put in place to minimise the impact on other airspace users and Stakeholder feedback is requested to help shape these assumptions:

- i. The Change Sponsor intends to implement the required segregation in the form of a Danger Area, which will provide the most efficient and tactical use of airspace. The MOD will activate the airspace structures only as and when absolutely necessary in support of large-scale exercises.
- ii. The proposed airspace will not be permanently active; it will only be activated for specific large-scale exercises. Under ACP-2021-048 notification through appropriate NOTAM action, at least 24 hours in advance of activations has occurred, however given the planning cycle associated with these multinational, large-scale exercises it is forecast that activation dates will be known many months in advance, providing ample notice to all Stakeholders.
- iii. It is acknowledged that the activation of the airspace hinders the usage of certain routes for key Stakeholders, simultaneously activation of the Danger Area is predicted to yield overall environmental benefits by reducing carbon emissions. In order to minimise any disruption during activation periods, it is envisaged that certain procedures will be applied in order to provide the most expeditious routing for aircraft that would ordinarily proceed without a diversion. To satisfy this requirement an all-encompassing Stakeholder Letter of Agreement would be generated to guarantee service provision and if the conditions of this agreement for whatever reason could not be met the Danger Area would not be activated.
- iv. Control of aircraft within the Danger Area would be provided by 19 and 20 Squadron (RAF Boulmer) with transit traffic subject to air traffic protocols provided by 78 Squadron (Swanwick Military). To provide a further level of certainty to non-participating airspace users, detailed entry and exit points with their associated transit route would be published and made available to Stakeholders prior to exercise commencement.

5.2 Utilisation of Airspace. The proposed Danger Area would be published in the Aeronautical Information Publication (AIP), but only activated for specific periods. These activations vary slightly depending on the exercise; however activations are likely to be infrequent and have been programmed to minimise the impact on Stakeholders, with Stakeholder flying schedules taken into account.

Danger Area activations would be managed independently through the UK Airspace Management Cell (AMC) with a FBZ enforced to enhance safety for airspace users who have filed flight plans. Participants will adhere to airspace sharing procedures by notifying any changes or cancellations to the proposed activation. It is envisaged

that a Letter of Agreement (LoA) would be generated, explicitly stating activation and cancellation procedures – a similar [LoA](#) has been successfully employed in relation to ACP-2021-048.

5.3 Lateral Position Requirements. The requirement for supersonic flight leads to geographical requirements. The Military Aviation Authority (MAA) Regulatory Article 2310 has the following regulations for non-operational supersonic flight:

“In the UK Flight Information Region (FIR), all supersonic flights should be conducted over the sea . . . Aircraft Commanders should ensure their Aircraft is at least 10 nautical miles (nm) out to sea and along a line of flight at least 20° divergent from the mean line of the coast.” “Supersonic flights with the aircraft pointing towards the land, turning, or flying parallel to the coast should take place at least 35 nm from the nearest coastline.”

5.4 Danger Area Activations. The aim of this ACP is not to move all training away from existing Danger Areas. As a guide it is proposed that the preferred airspace design would be used for certain Large Force Exercises. The quantitative Environmental Assessment has been based on a defined number of activations – driven largely by the frequency of exercises in 2022 (ACP-2021-048 refers). Committing to an exact number of Future Combat Airspace activations is not possible.

It is however envisaged that exercises will be infrequent, planned well in advance, will occur over the minimum possible duration, and will be scheduled as far as possible in advance and in consultation with key Stakeholders.

Exercises of this scale are likely to follow a similar annual pattern to that of the most recent activations (note these windows could be day/night or fall over the weekend period): The below table is taken from the Air Exercise Programme

	Season	Activations (total)	Duration (hours)
Exercise A	Spring/Summer	25	4 hours
Exercise B	Spring/Summer	12	4 hours
Exercise C	Throughout the year	18	4 hours

It must be noted that Exercise C has not occurred over the last 2 years (due to COVID), however there is an aspiration for this exercise to return. The total number of activations is not always reached due to factors such as poor weather, short notice operational requirements and insufficient military air traffic controller availability.

Section 6 – Baseline Airspace Activity

6.1 Current Day Scenario and Civil Airspace Activity. It is important to understand the current situation in relation to the preferred design option. The region identified hosts several international airports and other airspace users, including a popular gliding site. The below diagram with associated area of interest captures a number of the Stakeholders.

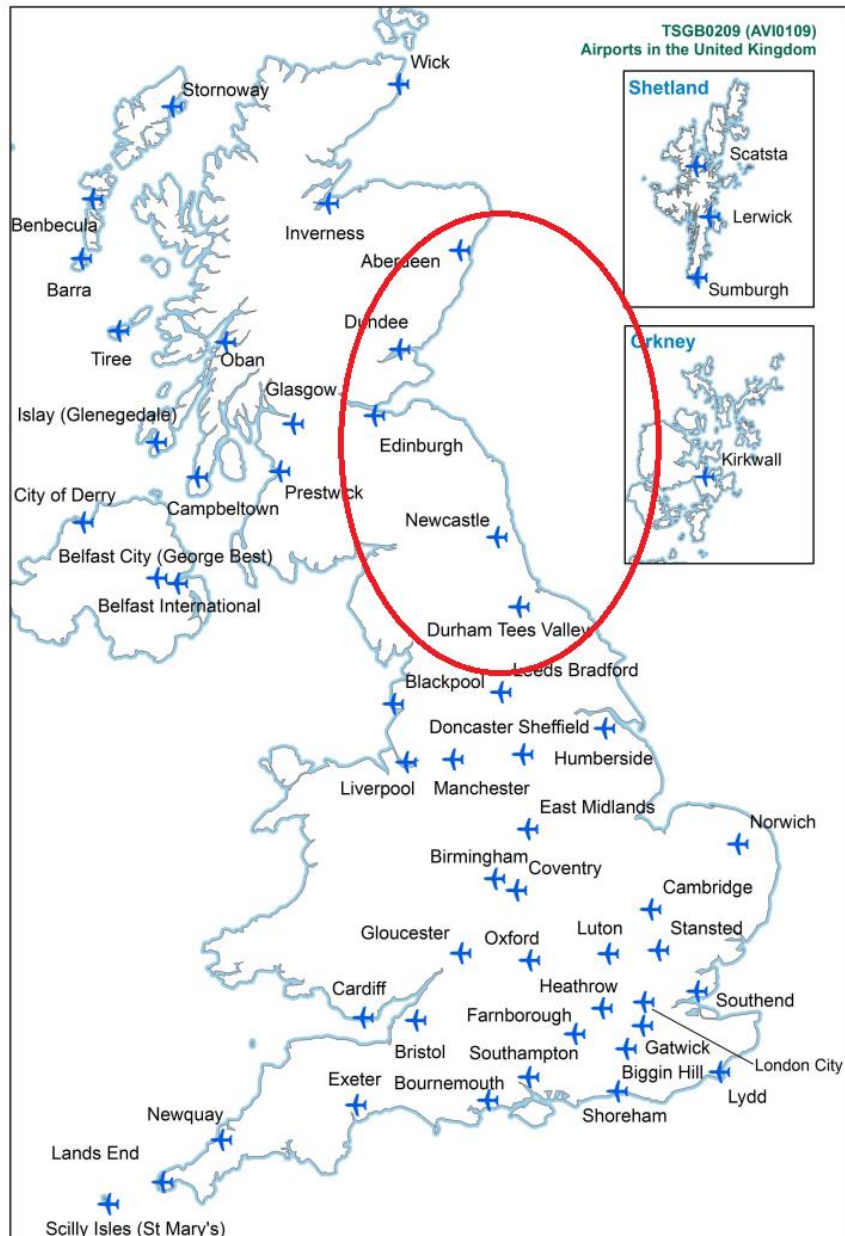


Figure 5, Map of UK Airports [Gov.uk Airports in the UK](https://www.gov.uk/government/collections/airports-in-the-uk)

Statistics taken from the Department for Transport (Air Traffic by service, operation type and airport 2010 – 2020), indicates that for aircraft landings and take-offs Edinburgh is the fifth busiest UK airport (handling 126,400 movements in 2019), Aberdeen is the 10th busiest (handling 76,100 movements), Newcastle is ranked 14th (handling 39,700), Durham Tees Valley handled 3,500 and Dundee handled 1,200.

**Air transport movements
(Aircraft landings and take-offs.
thousands)**

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
All traffic by airport:											
Aberdeen	88.0	94.8	98.8	99.9	106.1	95.7	80.0	81.9	77.5	76.1	45.8
Edinburgh	100.6	105.1	102.9	103.8	101.4	107.2	115.6	121.8	123.8	126.4	42.6
Newcastle	47.0	44.6	43.7	43.0	42.9	42.1	42.5	43.9	41.5	39.7	11.7
Dundee	3.6	2.8	2.7	1.4	1.2	1.2	1.4	1.2	1.2	1.2	0.7
Durham Tees Valley	5.6	5.1	4.2	4.3	4.0	3.9	3.7	3.9	3.6	3.5	-

Figure 6, Statistics taken from Department for Transport and Civil Aviation Authority, Air Traffic at UK airports (AVI01)

6.2 Newcastle International Airport. Figure 7 provides an indication as to how the preferred Danger Area is approximately positioned in relation to Newcastle International Airport. Aircraft both to and from Newcastle using the network structure can still utilise existing Standard Instrument Departures and Standard Arrival Routes which proceed through Newcastle controlled airspace – marked approximately with the red and blue arrows.

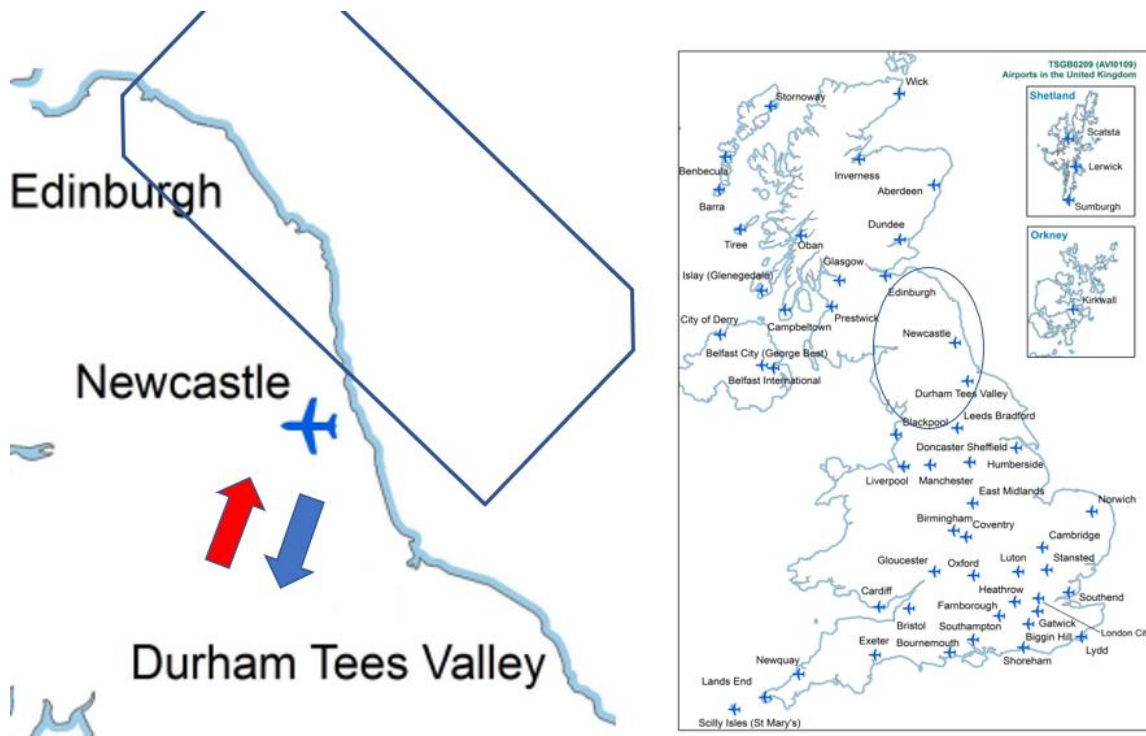


Figure 7, approximate position of preferred design in relation to Newcastle International Airport

It is acknowledged that for certain arrivals and departures, following these exacting instrument profiles may not be overly expeditious and therefore airlines may elect to fly on a more direct route or air traffic controllers will offer a routing that is more efficient for any flight profile that does not necessarily fit this requirement.

The impact of the preferred design option on Newcastle Airport was therefore assessed to understand this impact. The following criteria were used: Eurocontrol NEST (v1.8), define the set of relevant flights as all initial flight plans in AIRAC 2205 (19 May 2022 – 15 June 2022) which meet the following criteria:

- Arrive at or depart from Newcastle International Airport
- Fly through or below the preferred airspace design option
- Estimate the number of relevant flights impacted by a possible activation, by calculating the number of flights which enter the preferred airspace within a 4-hour rolling window* e.g. 00:00 – 03:59, 01:00 – 04:59, 02:00 – 05:59, ... 20:00 – 23:59

- Take the maximum number of impacted flights across all 4-hour windows in AIRAC 2205 to calculate the maximum possible impact of a single activation of the Danger Area.

Maximum Number of Impacted Flights per Activation	5
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The maximum number of impacted flights per annum was calculated based on the assumption of 32 activations per year (historic norm).

The maximum number of impacted flights per annum were then grown using the October 2021 STATFOR forecast and NATS forecast when STATFOR was not available, to estimate the annual impact to 2033 (10 years post deployment).

Year	Max Impacted Newcastle Traffic per Annum
2023	171
2024	178
2025	180
2026	183
2027	186
2028	189
2029	191
2030	194
2031	197
2032	200
2033	203

Based on this quantitative assessment (using AIRAC 2205) the Sponsor acknowledges that a small proportion of Newcastle traffic will potentially be impacted by the preferred design option, however it is not possible to quantifiably determine whether this change will impact upon traffic patterns below 7,000 feet. Consultation is therefore requested in order to determine an appropriate way forward.

6.3 General Aviation Activity. A report generated by *Airspace for All* (October 2018) identified that a Visual Flight Rule Significant Area of Interest was located between Edinburgh and the Angus East Coast, activity that includes flight training, aircraft rental, hang-gliding, parachuting, aerial surveying, police and helimed flights. It was also highlighted that this area is used by traffic transiting on the East Coast to/from central Scotland and North-east England and it may be the only option to avoid high ground of the Southern Uplands and associated cloud bases. The image below highlights the usage of the airspace by General Aviation in Class G airspace. The darker colours representing greater levels of aerial activity.

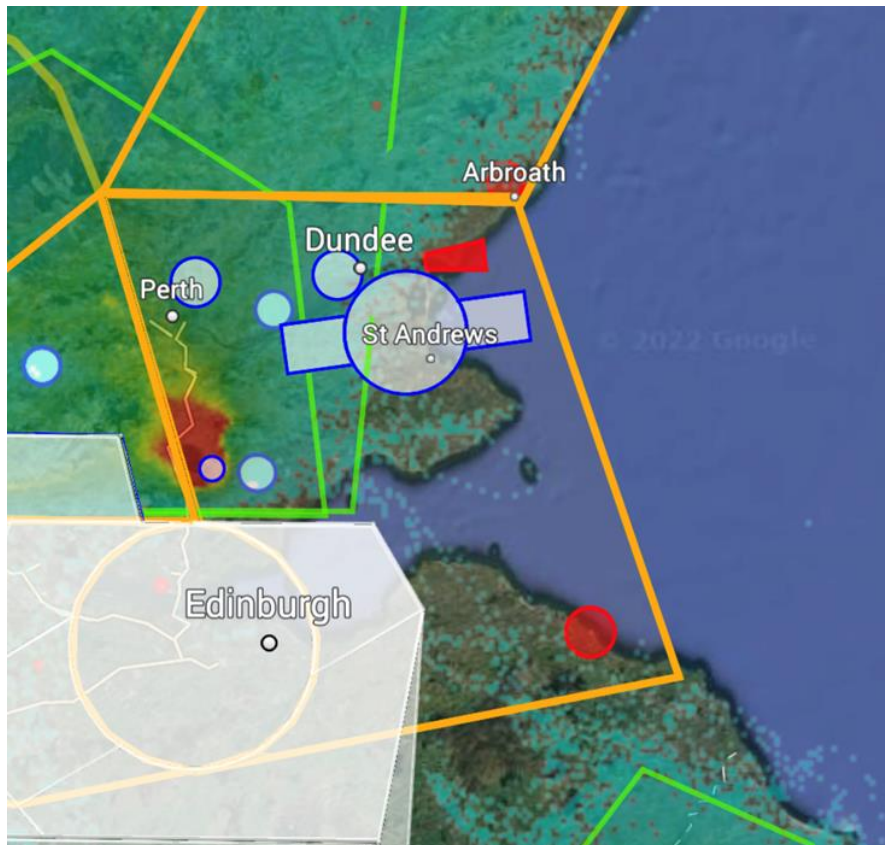


Figure 8, FASVIG [VFR significant areas](#)

In order to assess the level of this Visual Flight Rule activity in this region and in relation to the preferred Danger Area, analysis of [ADS-B Exchange - track aircraft live \(adsbexchange.com\)](#) was conducted by the Sponsor. The following criteria were employed:

- Source: ADS-B, MLAT, Mode-S
- Lateral limit of assessment: Preferred Danger Area (+5nm lateral buffer)
 - i) Area 1, overland area from 56 to 57 degrees North
 - ii) Area 2, overland area from 55 to 56 degrees North
 - iii) Area 3, remaining lateral limit of preferred design over high sea area

- Altitude: Surface level to FL195 (any aircraft above this level is within Class C airspace).
- Date: 8 – 12 Aug 2022 and 15 – 19 Aug 2022 (2-week period, discounting weekends and 18 August as this date corresponds with the activation of Danger Area associated with ACP-2021-048).
- Time: 0900 – 1300 UTC (to align with most common activation periods).
- Aircraft criteria: General Aviation movements that met this criterion were annotated (irrespective of the fact that certain callsigns were observed on multiple occasions). Baseline civil movements that routed to/from Newcastle were discounted as they are captured in the separate analysis above. Gliders were discounted from this analysis – given that gliding activity is captured below in section 6.4.

The Sponsor selected dates that did not correspond with any activations of the preferred design option (based on TDA EGD597) as it was important to assess traffic intensity/movements that were not subject to any restrictions/notifications of Danger Area activity.

The following observations were made based on the employed criteria:

Criteria	Number
Total number of general aviation movements observed across assessment period	329 aircraft
Average number of daily general aviation movements across entire area of interest	36.5 aircraft
Average number of daily general aviation movements identified within area 1	24.5 aircraft
Average number of daily general aviation movements identified within area 2	7.3 aircraft
Average number of daily general aviation movements identified within area 3	4.4 aircraft
Average altitude of general aviation movements (all areas)(nearest 250 feet)	4000 feet (above mean sea level)

General Aviation Assessment, it must be noted that the lateral extent covered by the preferred design option (when using the +5nm lateral buffer criteria is significant) and irrespective of this vast area the Sponsor deduces that the number of general aviation movements is relatively low (average of 36.5). The region of St Andrews, Dundee and Perth experienced the highest number of movements, with a noticeable paucity of traffic along the Northumberland coastline to the region South of Newcastle. Given that the average operating altitude of those general aviation movements observed was 4,000 feet, significant freedom is afforded to these airspace users when the base level of the Danger Area is set at FL85 and it could therefore be argued that very little restriction is placed upon these operators.

6.4 Gliding Areas

This proposal has the potential to affect VFR pleasure flying, particularly gliding. Borders Gliding Club (identified in the below diagram by the green oblong) routinely operating up to FL 245.

Understanding the exact intensity of gliding activity in the region is difficult given the flexible nature of the profession. Borders Gliding Club has approximately 120 members of which 40 – 50 operate routinely. The British Gliding Association (BGA) 'Ladder' provides only a very approximate indication of the total activity from this location, entries on the Ladder must meet certain height and distance criteria and therefore training and pleasure flights will not be added to this record, *using the BGA Ladder is not therefore a fair representation for this study.*

Qualitative feedback from the Borders Gliding Airspace and Liaison Officer indicates that operations occur only on Fridays, Saturdays and Sundays; on average there can be 15 – 20 flights a day, with a maximum recording of 37 flights on one particular day (figure 10 below refers), however these numbers do not include the aircraft tug that is used to launch each glider. The intensity of the activity at Borders Gliding Club is identified in the below heatmap, the main area of intensity depicted by the green oblong, with a dispersal of traffic as you proceed further from the main epicentre.

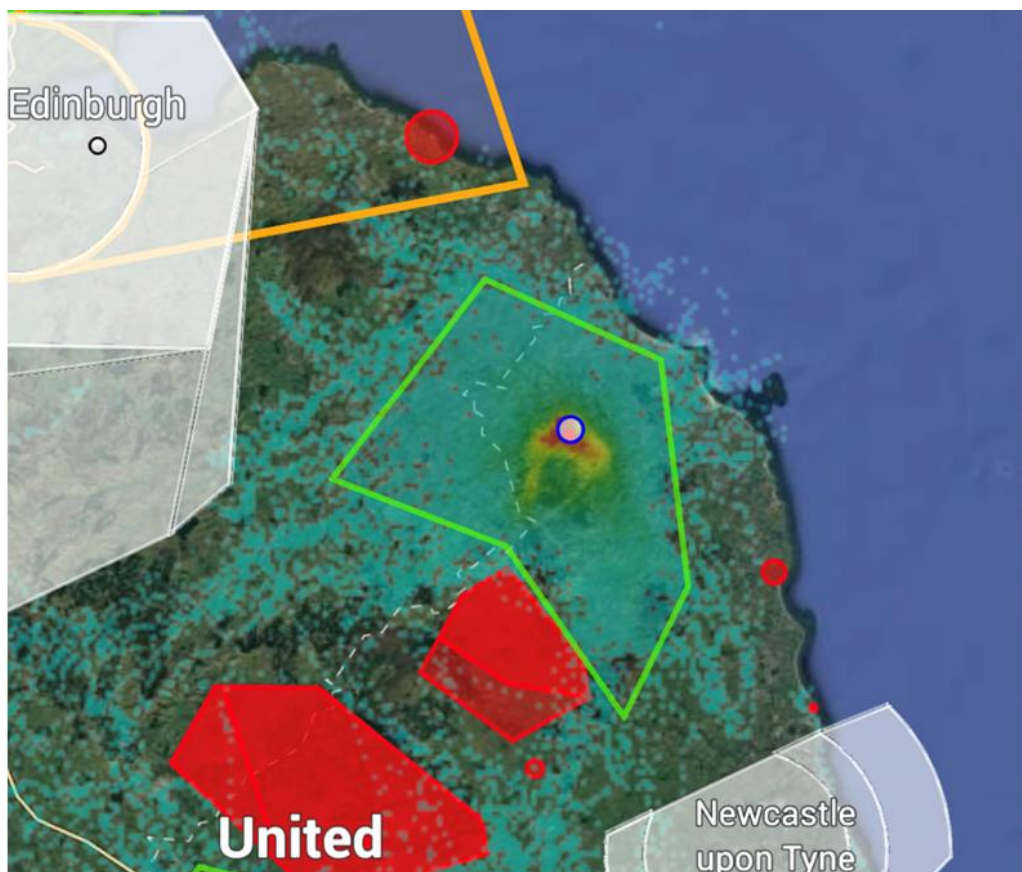


Figure 9, Borders Gliding Club activity heatmap [VFR significant areas](#)

Daily Logsheets: Monday Tuesday Wednesday Thursday Friday Saturday Sunday

DATE	NO	NAME	TYPE	TIME	START	END	ALT	TIME
25/10/2022	3	GF		790	G-EFER	10:54	1403	3000 03:09
25/10/2022	4	TB	PH	JZB	G-BJCI	10:56	11:22	2000 00:26
25/10/2022	5	PG		JTO	G-BJCI	11:08	11:19	2500 00:11
25/10/2022	6	KA		JTP	G-EFER	11:10	12:10	3000 01:00
25/10/2022	7	SB		19X	G-BJCI	11:18	11:43	3000 00:25
25/10/2022	8	SF	RH	291	G-BJCI	11:32	15:31	2500 03:59
25/10/2022	9	TB		FVP	G-EFER	11:38	15:36	3000 03:58
25/10/2022	10	RS		RS	G-BJCI	11:44	12:00	3000 00:16
25/10/2022	11	SG		FWM	G-EFER	11:52	12:03	2500 00:11
25/10/2022	12	MC	GG	EF	G-BJCI	12:02	14:45	2500 02:43
25/10/2022	13	DC		F20	G-EFER	12:04	13:00	1500 00:56
25/10/2022	14	WS	XM	JAD	G-BJCI	12:16	12:58	2500 00:42
25/10/2022	15	TB	PH	JZB	G-BJCI	12:31	12:40	1500 00:09
25/10/2022	16	BA		137	G-BJCI	13:10	14:10	2500 01:00
25/10/2022	17	JS	BW	JZB	G-BJCI	13:10	13:55	2500 00:45
25/10/2022	18	AP		AP	G-EFER	13:18	16:08	3000 02:50
25/10/2022	19	DM		FFS	G-EFER	13:30	14:40	3500 01:10
25/10/2022	20	RB	RH	KA	G-BJCI	13:37	16:14	3000 02:37
25/10/2022	21	RH		S2	G-EFER	13:53	15:20	3000 01:27
25/10/2022	22	WS	SG	JAD	G-BJCI	14:06	15:09	3000 01:03
25/10/2022	23	DC		F20	G-EFER	14:06	15:30	3000 01:24
25/10/2022	24	JR		546	G-CKIU	14:09	14:58	3000 00:49
25/10/2022	25	TB	AE	A34	G-BJCI	14:18	14:50	2000 00:32
25/10/2022	26	CS		CKL	G-EFER	14:20	15:25	2500 01:05
25/10/2022	27	KA		TL2	G-CKIU	14:23	14:49	3000 00:26
25/10/2022	28	DW		EDJ	G-EFER	14:34	15:33	2500 00:59
25/10/2022	29	RS		RS	G-CKIU	14:37	15:00	2500 00:23
25/10/2022	30	BS		KJB	G-BJCI	14:37	16:17	2500 01:40
25/10/2022	31	CD		CD	G-BJCI	14:46	15:18	3000 00:32
25/10/2022	32	PG		JTO	G-EFER	15:05	16:27	3000 01:22
25/10/2022	33	SG		FWM	G-BJCI	15:09	15:26	2000 00:17
25/10/2022	34	TB	PH	JZB	G-BJCI	15:21	15:21	C/B 00:00
25/10/2022	35	GR	RW	JAD	G-BJCI	15:42	16:01	2500 00:19
25/10/2022	36	TB	PH	JZB	G-BJCI	15:53	15:53	C/B 00:00
25/10/2022	37	PH		JAD	G-BJCI	16:26	16:44	2000 00:18

Figure 10, Borders Gliding Club Daily Log Sheet (25 Oct 2022)

Consultation is sought in order to determine possible deconfliction and notification periods regarding the activation of the preferred design option.

Section 7 - Enroute Analytics and Environmental Analysis

7.1 Air Traffic Sampling. NATS Analytics were requested to produce an Environmental Impact Assessment (A22131), with the output being derived from the following assumptions:

- 32 activations per year (based on planned activations for 2023)
- EGD323 and EGD613 are simultaneously active
- Fuel impact of this change would occur at cruise
- 124 flights per activation period
- 0900 – 1300 UTC identified as most common activation time

Simulated baseline air traffic models have been produced using NEST (v1.8) and emissions figures produced using BADA 4.2 data, made available by the European Organisation for the Safety of Air Navigation (Eurocontrol).

The traffic sample was taken from the 2205 AIRAC from Eurocontrol. This AIRAC was chosen in order to provide a reasonable mid-point in traffic numbers, between the two expected activation periods of March and August/September. A 2022 AIRAC was required to give an up-to-date baseline set of traffic that was not considerably impacted by the COVID-19 pandemic.

The following 4 days were picked to simulate: 20/05/2022, 28/05/2022, 06/06/2022 and 08/06/2022. These 4 days were picked to give a good overall representation of traffic, with the following factors considered: Weekday, Traffic count and City pair flows. The traffic sample is defined as any flight whose simulated trajectory changed due to the activation of EGTDA597 or the deactivation of EGD323 and EGD613.

Traffic included must have crossed the Traffic Filter Region (TFR) during the sample days above. The TFR is a modified version of the UK FIR, reduced to remove flights with trajectories which would not be impacted by the danger areas of interest.

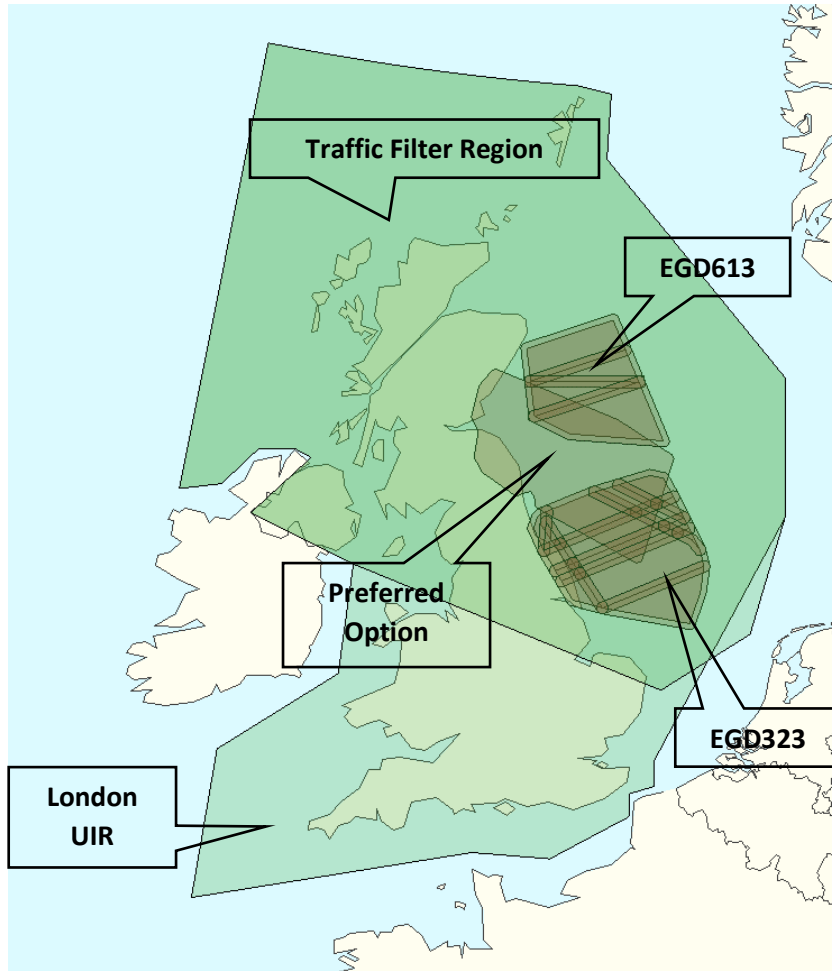


Figure 11, Traffic Filter Region NATS Analytics

7.2 Effect on Aviation. Due to the proximity of the danger areas to the eastern edge of the UK FIR (London and Scottish FIRs), many flights need to change their UK entry/exit point between the Baseline and Scenario simulations in order to produce a valid flight plan. Therefore, the trajectories were simulated within the Simulated Region, with the entry and exit points matching those from the initial flight plan.

The Simulated Region is an artificial piece of airspace created for this study, matching the UK FIR on the Atlantic boundaries, but expanding across European airspace. This fixes the Oceanic UK FIR Entry/Exit point for any transatlantic flights, ensuring that the North Atlantic Tracks are utilised in a realistic manner.

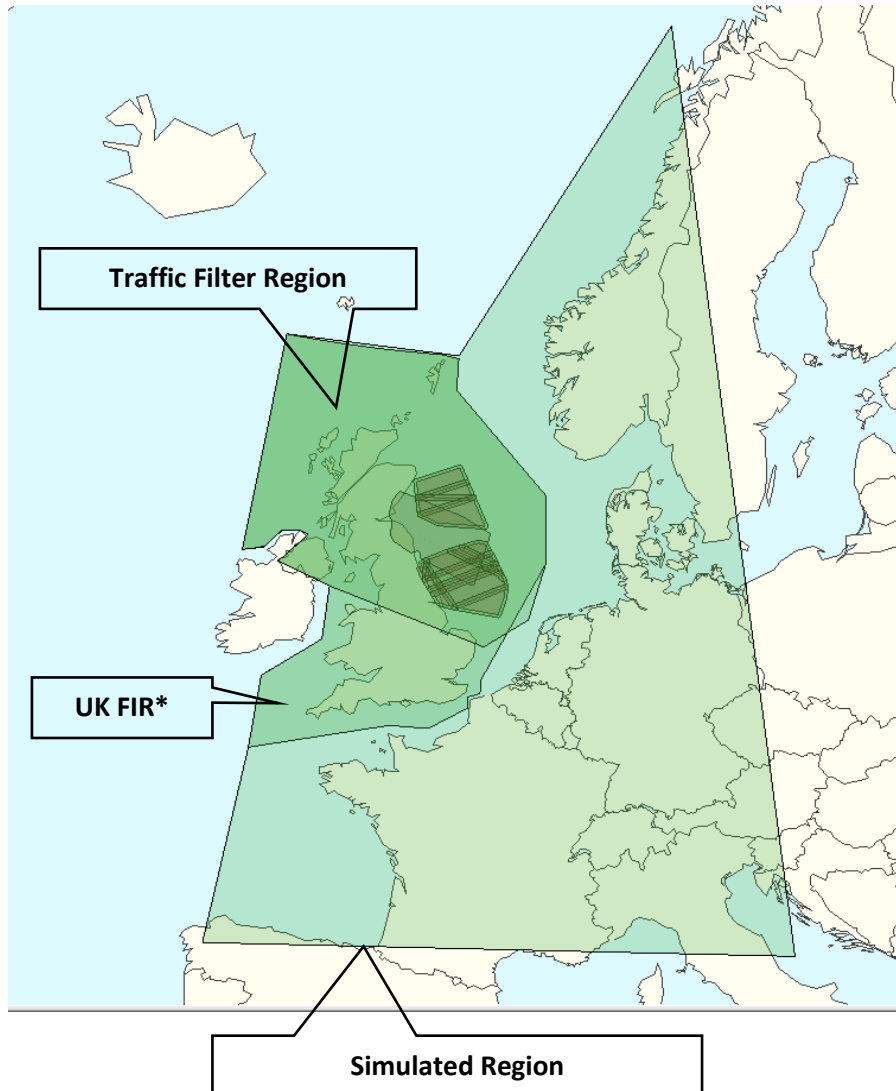


Figure 12, Simulated Region for sample study NATS Analytics

*UK FIR includes the London and Scottish FIR and UIR

The image below shows an example pair of Baseline (red) and Scenario (green) trajectories. The green dots mark the points where the flight enters or exits the UK FIR.

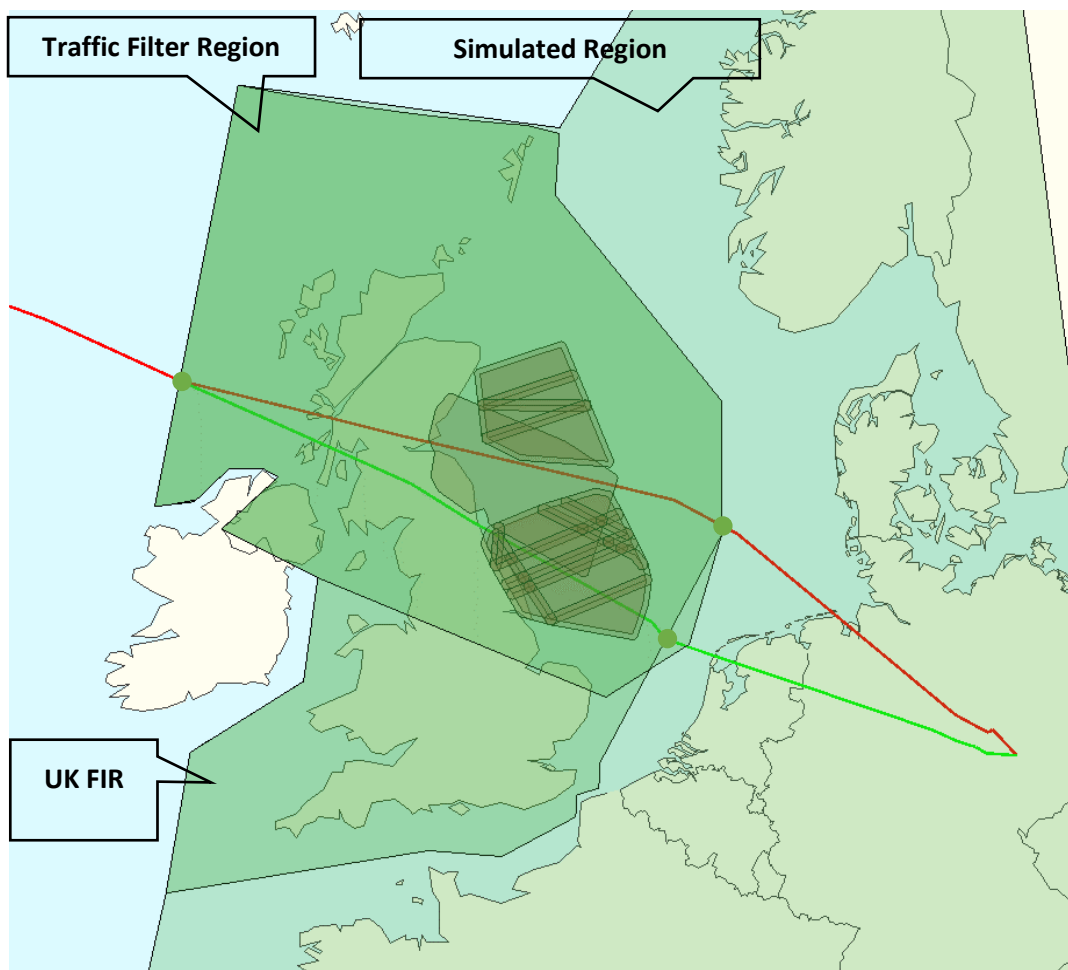


Figure 13, projected flight profile during various simulated scenarios NATS Analytics

In the Scenario, where the EGD323 complex is not active, the flight can take a shorter route through this airspace.

7.3 Environmental Impact

Method - the track distance flown within the UK FIR (NM) was taken from the Baseline and Scenario models and used to calculate the change in distance flown. The fuel burn at cruise by aircraft type was then taken from the BADA 4.2 PTF tables and used to calculate the fuel burn change based on the change in distance flown.

The traffic was used to represent an activation of the preferred Danger Area and the number of activations have been scaled to represent an annual benefit (32 activations per year assumed based on the number of activations planned in 2023).

Traffic was grown using the October 2021 STATFOR forecast and NATS forecast when STATFOR was not available, to estimate the annual impact to 2033 (10 years post deployment).



Figure 14, flight profile with D323 and D613

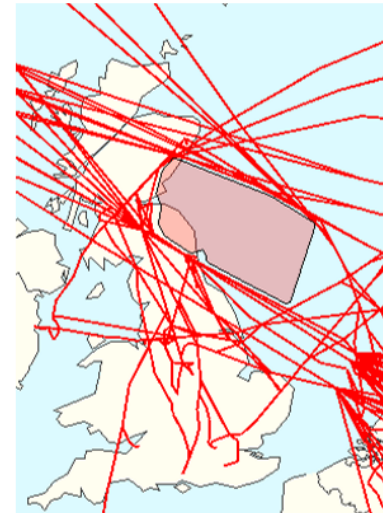


Figure 15, flight profile with preferred option

The table below shows the estimated impact of the change within UK airspace for the 10 years following implementation.

Civil Flights within UK FIR			
Year	Traffic	Fuel Impact (Tonnes)	CO ₂ e Impact (Tonnes)
2023	4230	-332	-1,055
2024	4412	-346	-1,100
2025	4474	-351	-1,115
2026	4541	-356	-1,132
2027	4609	-361	-1,149
2028	4678	-367	-1,166
2029	4748	-372	-1,184
2030	4819	-378	-1,202
2031	4892	-384	-1,220
2032	4965	-389	-1,238
2033	5039	-395	-1,256

Figure 16, estimated impact of change within UK airspace (over 10 years). Positive fuel numbers indicate additional contribution (penalty), negative numbers indicate lower contribution (benefit)

The analysis suggests that fuel burn and CO₂e emissions within the UK FIR will reduce as a result of this proposal.

Assumptions have been made to fix the many variables which impact the estimated benefit. Therefore, the observed benefit may change considerably if these assumptions such as the number, length and time of activations do not hold true.

7.4 Average Results

The average route length, fuel burn and carbon dioxide equivalent (CO₂e) emissions per flight within the UK FIR are given in the table below. The average flight has a reduced track distance subsequently lowering the fuel burn and emissions.

Average per Flight from 2022 4 day Sample	Average Track Distance within UK FIR (NM)	Average Fuel Burn within UK FIR (Kg)	Average CO ₂ e within UK FIR (Kg)
Baseline	417.28	3,730.6	11,863.2
Scenario	408.21	3,652.2	11,613.9
Difference	-9.07	-78.4	-249.3

Figure 17 - CO₂e is a standard measurement that considers the impact of all greenhouse gas emissions due to fuel burn as if they were all carbon dioxide. For aviation fuel, the conversion rate is 1kg fuel to 3.18kg of CO₂e

7.5 Annual Environmental Impact

The table below shows the annualised impact of this change in terms of fuel burn and CO₂e emissions for years 2023 – 2033.

Civil Flights within UK FIR							
Year	Traffic	Baseline Fuel Burn (Tonnes)	Scenario Fuel Burn (Tonnes)	Fuel Impact (Tonnes)	Baseline CO ₂ e (Tonnes)	Scenario CO ₂ e (Tonnes)	CO ₂ e Impact (Tonnes)
2023	4,230	15,780	15,448	-332	50,180	49,126	-1,055
2024	4,412	16,458	16,113	-346	52,338	51,238	-1,100
2025	4,474	16,689	16,338	-351	53,071	51,955	-1,115
2026	4,541	16,939	16,583	-356	53,867	52,735	-1,132
2027	4,609	17,193	16,832	-361	54,675	53,526	-1,149
2028	4,678	17,451	17,084	-367	55,495	54,329	-1,166
2029	4,748	17,713	17,341	-372	56,327	55,143	-1,184
2030	4,819	17,979	17,601	-378	57,172	55,971	-1,202
2031	4,892	18,248	17,865	-384	58,030	56,810	-1,220
2032	4,965	18,522	18,133	-389	58,900	57,662	-1,238
2033	5,039	18,800	18,405	-395	59,784	58,527	-1,256

Figure 18, positive numbers indicate additional contribution (penalty), negative numbers indicate lower contribution (benefit)

Section 8 – Consultation Process

8.1 Consultation Duration. It is proposed that the Consultation will run for a period of 13 weeks commencing 6 February 2023, closing on 8 May 2023. A variety of activities will occur during the consultation period to maintain an exchange of information and to maximise positive exposure of the Airspace Change Proposal.

8.2 What is being asked? The purpose of this consultation period is to provide an opportunity for all Stakeholders to comment on the proposed airspace design. This feedback will be collated and analysed by the Change Sponsor, helping to shape the final proposal that will be submitted to the CAA.

The key themes that the Change Sponsor is seeking to answer through consultation include, but is not limited to, the following:

- Feedback on the airspace design presented to achieve appropriate airspace
- The perceived effect of this proposal (positive or negative)
- Key concerns for Stakeholders
- Mitigating factors that could be employed to minimise impact

8.3 How to respond. As per CAP 1616 this consultation will be undertaken through electronic communication, and it is therefore requested that Stakeholders wishing to provide feedback do so through the Citizen Space online portal.

A response form, along with the Consultation Documentation can be found on Citizen Space. Additionally, all supplementary documentation so far can be found on the CAA ACP Portal.

A paper copy of this Consultation Document including the Feedback Form will be available on request at the address below. If Stakeholders are unable to respond electronically written responses to the hard copy form at Appendix A may be submitted to the address below, including a stamped envelope if a reply is required:

Airspace Change Sponsor
HQ 11 Group
Air Command
Hurricane Block
RAF High Wycombe
Walter's Ash
HP14 4UE

The deadline for receipt of responses is 8 May 2023. All written responses will be subsequently uploaded to the CAA ACP Portal.

8.4 Next Steps. Consultation responses will be collated and assessed throughout the consultation period. Once the consultation period has closed the Change Sponsor will analyse and categorise all responses received and a consultation report published articulating the categorisation process, issues raised and how they have been resolved. Finally, it will confirm the final option to be submitted to the CAA or what additional amendments are to be made to the chosen design because of consultation feedback.

The Change Sponsor will then upload the document to the CAA ACP Portal once the CAA has confirmed that no further consultation is required.

The Change Sponsor will continue the ACP process in line with the below timeline.

Date	Activity	Location
3 Feb 2023	Stage 3B Consult Extraordinary Gateway	
6 Feb 2023	Stage 3C Consultation Launch	CAA ACP Portal, Citizen Space
15 Feb 2023	Face-to-face and virtual events	Identified Stakeholder locations, virtual
20 Feb 23	Reassessment of Consultation	
20 Mar 2023	Reminder to Stakeholders	Email and phone correspondence
30 Apr 23	Reminder to Stakeholders	Email and phone correspondence
8 May 23	Consultation closes	

CAP 1616 requires change sponsors to make it clear to Stakeholders the extent to which the proposed airspace change, once implemented, is reversible if it does not meet the objectives it is designed to achieve. The Change Sponsor will formally assess the effectiveness and usage of any implemented airspace at the post-implementation review at Stage 7. The Sponsor considers the design presented within this consultation to be the ‘minimum’ option. The ‘do nothing’ option has been discounted at the previous stage but is included at this stage for comparison as a baseline.

As the Sponsor is seeking Special Use Airspace in the form of a Danger Area that will be activated by NOTAM, should the airspace not achieve its intended aims, the MOD will not activate it – therefore not causing any impact to air users. Subsequent actions will see the MOD seeking an airspace re-design (requiring the Sponsor to conduct another airspace change) or request a full removal from the AIP.