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GATEWAY DOCUMENTATION: STAGE 2 Develop and Assess

STEP 2b Options Appraisal (Phase 1 initial) Including safety considerations Version 2

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References

1. CAP 1616 Airspace Change Process
2. All published documentation related to this airspace change proposal is available on the CAA Airspace Change portal:
<https://airspacechange.caa.co.uk/PublicProposalArea?pID=257>
3. CAP 1430 UK ATM Vocabulary
4. ACP-2020-042
<https://airspacechange.caa.co.uk/PublicProposalArea?pID=253>
5. ACP-2021-007
[Airspace change proposal public view \(caa.co.uk\)](#)
6. Department for Transport Air Navigation Guidance 2017
[Air navigation guidance 2017 \(publishing.service.gov.uk\)](#)

Introduction

The Ministry of Defence, and specifically 11 Group Training Enablers, is the change sponsor for this proposal. The proposal seeks to secure Future Combat Airspace (FCA) for the use by UK and multi-national partners during occasional large scale, highly complex, multi-domain collective training exercises that are used to prepare aircrews for operational service.

This document forms part of the Airspace Change Proposal document set required for the CAP 1616 airspace change process; stage 2 Develop and Assess, step 2b Options Appraisal (Phase 1 Initial) including safety considerations. Its purpose is to consider the shortlist of airspace design options which have progressed through step 2a(2) design principle evaluation via qualitative assessment. Under stage 2 the designs are not yet fully developed therefore the analysis may lack some granularity.

There is one design option in this document, in addition to the baseline do nothing option which is included for comparison. This document should be read in conjunction with step 2a(1) design options.

Where are we in the airspace change process?

We have completed stage 1, define, when we established a need for an airspace change and the design principles underpinning it. We are now in stage 2; develop and assess. This document is part of step 2b.

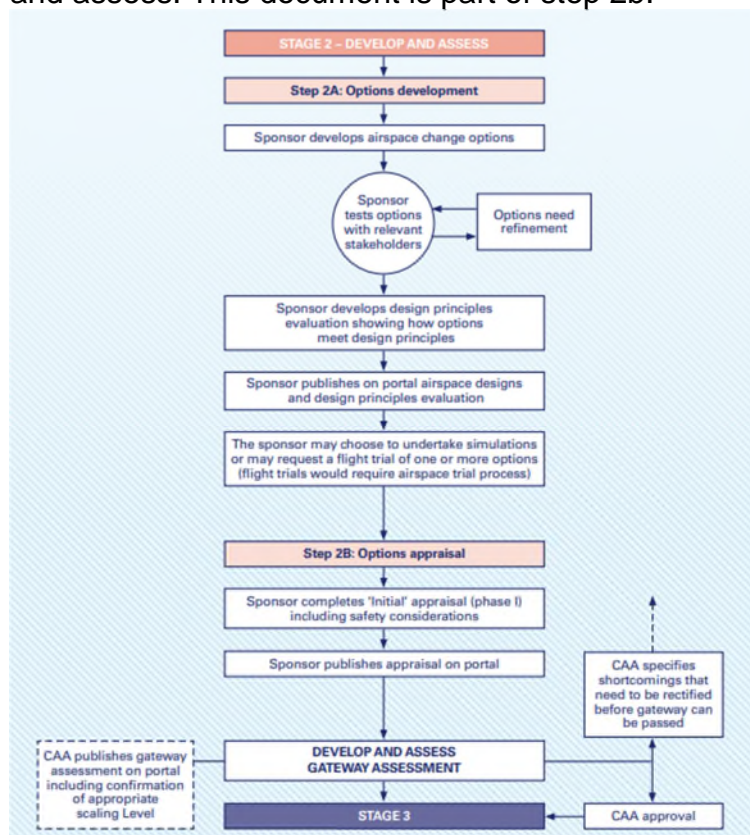


Figure 1 Airspace change process – Stage 2

How to read this document – illustrations of current and potential impacts

The following tables were based on CAP1616 4th edition, Table E2, pages 201-203. In this document we provide a table for the baseline do-nothing scenario, plus a table for the remaining design option. Note that the combined baseline do-nothing scenario (called Option Zero here) is included for comparison purposes only. It would not address the military requirement therefore failed to progress to the next step and has been ruled out of further consideration. Each table lists stakeholder groups alongside types of impact each design might have on that group. We describe broadly what we expect the scale of impact might be, for each type of impact. This is proportional and in line with the expectations of CAP1616 Stage 2.

Criteria against which the options have been assessed

Noise

The Department for Transport Air Navigation Guidance 2017 details the Government's altitude-based guidance as follows:

- a. in the airspace from the ground to below 4,000 feet, the government's environmental priority is to limit and, where possible, reduce the total adverse effects on people;
- b. where options for route design from the ground to below 4,000 feet are similar in terms of the number of people affected by total adverse noise effects, preference should be given to that option which is most consistent with existing published airspace arrangements;
- c. in the airspace at or above 4,000 feet to below 7,000 feet, the environmental priority should continue to be minimising the impact of aviation noise in a manner consistent with the government's overall policy on aviation noise, unless the CAA is satisfied that the evidence presented by the sponsor demonstrates this would disproportionately increase CO2 emissions;
- d. in the airspace at or above 7,000 feet, the CAA should prioritise the reduction of aircraft CO2 emissions and the minimising of noise is no longer the priority; **The sponsor invites CAA to agree that this proposal constitutes a Level M2 in line with this guidance.**
- e. where practicable, it is desirable that airspace routes below 7,000 feet should seek to avoid flying over Areas of Outstanding Natural Beauty (AONB) and National Parks;
- f. all changes below 7,000 feet should take into account local circumstances in the development of the airspace design, including the actual height of the ground level being overflown, and should not be agreed to by the CAA before appropriate community engagement has been conducted by the sponsor.

Given para e above, and the geographical area in this proposal, stakeholders were asked directly whether the proposals would change traffic patterns below 7000'.

How many activations?

The key concern for many stakeholders was the cadence of activations. It is anticipated that the proposed SUA will be activated for:

Exercise COBRA WARRIOR (~12-15 missions per exercise lasting up to 3 hrs per mission). Held twice a year.

STORM WARRIOR (~6 missions lasting 3 hours each). Held twice a year.

RISING PANTHER is held 6 times per year, twice a month in Feb, June and Nov with 3 missions per exercise lasting 3 hours each.¹

However, it was stressed during engagement with stakeholders that these are not guaranteed figures; the Military Airspace Management Cell (MAMC) would be responsible for notifying activations in accordance with the airspace usage plan.

Environmental impact

The Air Navigation Directions 2017 enable the CAA to disregard the environmental impacts of military aircraft when the proposal has been submitted by, or on behalf of, the MoD. However, the CO₂ emissions of civil aircraft re-routing because of this proposed change must be assessed.

Change Level

The changes proposed in this ACP affect civil aviation traffic patterns at 7000' or above and is therefore expected to be classified as **M2**. For the environmental assessment of a level M proposal, the Ministry of Defence need only ever assess the anticipated environmental impacts of the consequential changes on civil aviation patterns.

Assessment of the impact against level M1 criteria including Tranquillity and Biodiversity

At this stage it is acknowledged that there is a lack of evidence to corroborate the assumption that there is no impact below 7000'. This is due to a lack of information from ANSPs and unavailability of simulation. During Stage 3 the sponsor will engage with the Eurocontrol Network Manager in order to fully assess the impact on civil aviation due to the proposed change, this will form part of the consultation strategy. ANSPs will be consulted to the degree that any impact to departure and arrival profiles is fully understood and will be articulated in the Stage 3 documentation.

¹ This is the current exercise schedule, not a long-term forecast and is subject to change.

0 Do nothing – baseline option

This option is included for comparison purposes only. There are 2 possible scenarios for the do-nothing option, both explained in this document; the first is where the MDAs off the East coast are inactive, the second is where the MDA 323 and 613 complex is active with military traffic necessitating routes around these areas. This second scenario has been chosen because the proposal aims to provide a more suitable area for large exercises instead of MDA323/613 **not** as well as. It should be made clear that one of the proposed conditions is to suppress other MDAs when this proposed SUA is active.

Group	Impact	Level of analysis
Communities	Noise impact on health and quality of life	Qualitative
<p>The current MDA construct features portions of airspace almost exclusively over sea. This over-sea requirement is important due to the requirement for supersonic flight. MDAs used predominantly by RAF and USAF(E) aircraft are D323, D613, D513. Overland portions of these are not below FL150 therefore there is no affect to those communities. These MDAs are well-established, and routes exist to circumnavigate when they are active therefore do not affect traffic patterns below 7000’.</p>		
<p>Figure 2 – MDA structure</p>		
Communities	Air Quality	Qualitative
<p>The current MDA construct is almost exclusively over the sea at FL150 and above, there is no direct detrimental impact on air quality to communities in the geographical area. Aircraft participating in Large Force Exercises typically operate above FL80 therefore outside the scope of this metric.</p>		
Wider society	Greenhouse gas impact	Qualitative



Figure 3 – Routes between Newcastle/Edinburgh and Europe. D323 inactive.

The MDAs were established in their location due to the geography of RAF Main Operating Bases which are positioned along the Eastern side of the UK. Although this process does not require assessment of greenhouse gas emissions of military traffic, it is worth noting that this is the most efficient area for East Anglian based aircraft. However, it is somewhat further for aircraft joining from RAF Lossiemouth in Northern Scotland. When the D323 and 613 complex is inactive, direct routes are available between Newcastle and Edinburgh (the most heavily affected airports) and European destinations (Figure 3 illustrates)

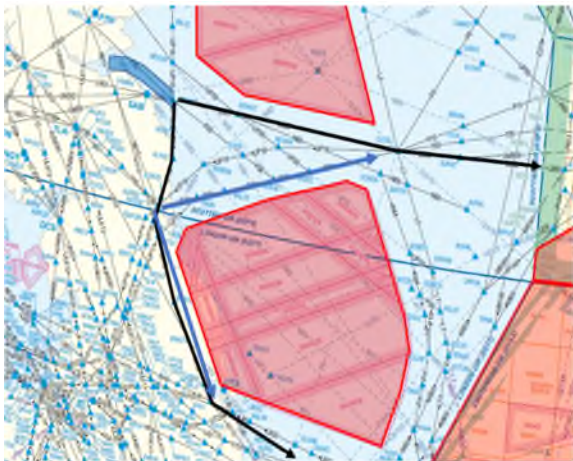



Figure 4 – Routes between Newcastle/Edinburgh and Europe. D323/613 active.

When these MDAs are active easterly routes are funnelled between the MDA 323 and 613 with some direct routes unavailable resulting in longer tracks and increasing fuel burn and greenhouse gas emissions, see figure 4.

Wider society	Capacity/resilience	Qualitative
The current MDA construct is well established, with effective control measures and managed by the Military Airspace Management Cell in order to minimise disruption.		
General aviation	Access	Qualitative
The current MDA construct is well established, with effective control measures and managed by the Military Airspace Management Cell in order to minimise disruption. Access to the airspace is only denied when active, MoD is working on measures to manage this more efficiently with the aim of reducing incidences where the MDA is notified as active although there are no aircraft inside.		
General aviation/ commercial airlines	Economic impact from increased effective capacity	
Outside the scope of this ACP		
General aviation/ commercial airlines	Fuel burn	Qualitative
Figures 3 and 4 above illustrate the effect that existing MDAs have on the fuel burn of affected civil traffic. Routes between the UK and mainland Europe are affected when MDA 323 is active. In addition, when D323 is active to FL660, the route of the North Atlantic transit traffic is affected.		
Commercial airlines	Training and other costs	Qualitative

No additional trg costs to deal with segregated airspace.		
Airport/Air navigation service provider (ANSP)	Infrastructure and operational costs	Qualitative
None		
Airport/ANSP	Deployment costs	Qualitative
Existing airspace structures are included in trg packages, no additional costs.		

1 Create Special Use Airspace over the North Sea with overland portions in NE England and SE Scotland

Group	Impact	Level of analysis
Communities	Noise impact on health and quality of life	Qualitative
		<p>Figure 5 opposite illustrates the proposed affected area. CAP 1616 states that for aircraft above 7000', the prioritised environmental impact is CO2 emissions, and an assessment of noise impact is not normally required. This proposal has the base of the MDA at FL85 in order to reduce any noise impact from participating military aircraft. It is understood that the second order effects on civil traffic should be taken into account therefore targeted engagement took place with those airports in the affected area with the direct question "will this proposal affect your traffic patterns below 7000'?" There were no responses indicating that there will be any</p>
<p>change resulting from this proposal. Although some routes will be affected, the distance between the proposed SUA and those airports affected is great enough that standard arrival and departure profiles can still be flown. In accordance with the requirements laid down in CAP 2091, the sponsor anticipates no or negligible change to the noise effects on the ground. One airport questioned whether there would be increased traffic routing to the Air Weapons Ranges (AWRs) as a result of the change. The dimensions and capabilities of the AWRs are not part of this proposal and the creation of an MDA does not affect use of Class G airspace for aircraft using AWRs.</p>		
Communities	Air Quality	Qualitative
<p>In accordance with CAP 1616 para B72 this assessment is not required because the proposal will not affect emissions below 1000'.</p>		
Wider society	Greenhouse gas impact	Qualitative
<p>This proposal would create a portion of segregated airspace which would have to be avoided, this will result in extra miles being flown on some routes when it is active. However, this is balanced to some extent by the addition of a protocol prohibiting the concurrent activation of other MDAs. This would make some more direct routes between England and Europe available. Early feedback from previous activations of temporary airspace structures in this area indicates that this creates a saving in greenhouse gas emissions. See the diagrams in the "Fuel burn" section below for an illustration of how some routes are likely to be affected. During Stage 3, the sponsor will determine how many aircraft are directly affected by the proposed SUA. The results of this may decide whether a full quantitative analysis is required.</p>		
Wider society	Capacity/resilience	Qualitative

There is not expected to be any impact on the UK infrastructure. Although routes for some passenger flights may be disrupted, other routes would be available and each activation is for a pre-notified, specific time period.

General aviation	Access	Qualitative
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Newcastle International Airport have justifiably raised the most concern over this proposal as it has the possibility to affect their traffic, particularly that routing to/from the East. Edinburgh Airport have their own ACP in progress, consultation will and must take place during Stage 3 in order to create workable solutions based upon temporal agreements. The Air and Space Warfare Centre have already been asked to create a procedure for notifying activations well in advance. This should satisfy the concerns raised by the Borders Gliding Club. Analysis and modelling will take place during Stage 3 to attempt to determine exactly how many aircraft are likely to be affected. The sponsor will work with NERL to design airspace with the minimum disruption to general aviation as possible. Routes affected will not be closed, an alternative route will be proposed.

General aviation/ commercial airlines	Economic impact from increased effective capacity	
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Outside the scope of this ACP

General aviation/ commercial airlines	Fuel burn	Qualitative
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The segregation of a large volume of airspace will undoubtedly add extra track miles to some routes.
 Those routes most affected are the routes from both Newcastle and Edinburgh to CUTEL and those which would routinely use P18 when available.
 As an example, an aircraft departing Newcastle via ERLOT and CUTEL would have to travel approximately 80nm further to reach CUTEL.
 An aircraft routing direct via P18 between Aberdeen and Newcastle would travel between 45-50nm further. However it must be stressed that P18 is currently only available at specific times² and it is unlikely that daytime SUA activations would affect this route.
 The sponsor is aware of the ACP in progress to extend the availability of P18 and will engage throughout the process to agree shared use of this airspace³.

² Fri (or the day preceding a PH) 1500 (1400) to Mon (or the day following a PH) 1000 (0900); Tue-Fri 0530-0900 (0430-0800). May-Sep, Mon-Thu 1900-0900. It is unavailable for Flight Planning at all other times.

³ [Airspace change proposal public view \(caa.co.uk\)](http://caa.co.uk)

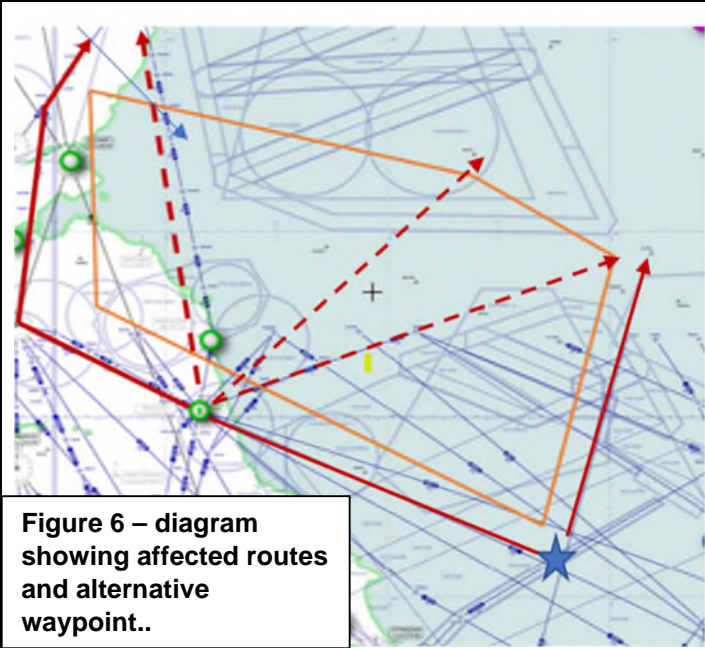


Figure 6 – diagram showing affected routes and alternative waypoint..

Figure 6 shows proposed routes to be taken during SUA activations. The dashed lines illustrate unavailable routes, the star is the proposed position for an alternate waypoint. Departures/arrivals from Edinburgh have the option to route either North or South of the area with another alternative waypoint proposed off the north western corner of the SUA. in comparison to proposed SUA activations.

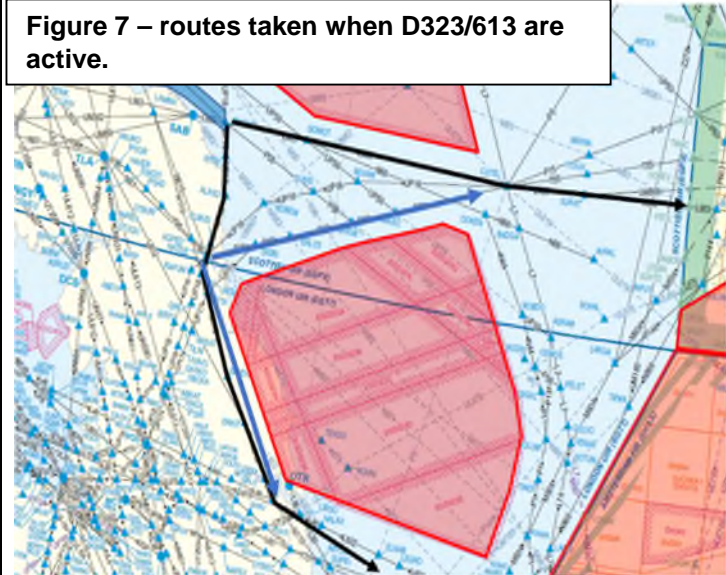


Figure 7 – routes taken when D323/613 are active.

Feedback from trial activations of segregated airspace in a similar location indicated that with the suppression of D323, many aircraft were able to take more direct routes to their destination and burned less fuel. Further modelling will be required to prove this as admittedly this was during a period of reduced traffic levels due to C-19 travel restrictions

Commercial airlines	Training and other costs	Qualitative
<p>No additional trg was identified by airlines, there has been a lower than expected level of engagement thus far with only one airline offering any comment on the process, although training was not a concern. The sponsor will continue to target those airlines most affected by this proposal, engaging with and reporting any feedback.</p>		
Group	Impact	Level of Analysis
<p>Airport/Air navigation service provider (ANSP)</p>	<p>Infrastructure and operational costs</p>	<p>Qualitative</p>
<p>There is some monetary cost in the design of the airspace structure. In addition there are workforce hours spent in creating and promulgating the changes. Procedures for departures/arrivals which would normally route through the affected airspace must be changed. A considerable amount of money and workforce hours</p>		

have gone into the design for temporary activations, the sponsor hopes to use this as a basis for the permanent solution in order to minimise costs to ANSPs.

Airport/ANSP	Deployment costs	Qualitative
Training will be required for ATCOs at regional airports and the Area Control Centres. SIDs and STARs are unlikely to be affected; a letter of agreement between regional airports and the area control centres will be proposed.		

Safety Assessment

This section provides a brief, qualitative overview of the impact of the remaining option on aviation safety.

The evidence feeding into this safety assessment has been obtained through stakeholder feedback and from the results of a previous activation of TDA 597 in March and September 2021 which identified some lessons.

Currently, route structures are published and airlines plan to route via ATS routes or flight plannable Directs (DCTs). These are deconflicted from active SUAs where necessary using strategic deconfliction methods and published waypoints. This proposal would introduce a new SUA and make some of these waypoints unavailable necessitating the introduction of alternative routes. This unfamiliarity is a hazard in itself and new procedures may need to be designed and published. During the latest activation there were no reported safety occurrences.

High energy manoeuvres would take place during Large Force Exercises which require segregation from GAT for the protection of both military exercise traffic and civil aviation, this is the main driver for this proposal. In later stages of the design process, the proposal should look to incorporate a flightplan buffer zone (FBZ) in addition to a temporal buffer to ensure separation in both time and space. NATS are of the opinion that the FUA processes, flight plan management and FBZ were a success during the trial and temporary activations of TDAs in the geographical area of the proposal and, although this is a new proposal for a permanent SUA, the benefits to safety from using familiar airspace with existing structures and protocols cannot be understated. The SUA, routings and FBZ should be made known to Eurocontrol for network visibility reducing the risk of any late notice route changes to aircraft in flight.

There is potential for an increase in fast jet traffic taking up ATCO workload, infringing controlled airspace or recovering to civil airports in an emergency, but none of this transpired during the March or September 2021 activation. It is, however acknowledged by the sponsor that a robust procedure should be implemented so that traffic routing in and out of Newcastle is provided with an ATS from the appropriate ANSP; this will be a priority during stage 3.

Next steps

The next step is the stage 2 gateway on 11th March 2022. For the next stage where a full options appraisal is required, further evidence will be harvested from the temporary activation and either Eurocontrol or NATS (or both) will be approached for modelling to assess the environmental and operational impact to civil aviation. Further consultation with airports and ANSPs will take place in order to create rigorous procedures.