Modernising Midlands Airspace

Gateway Documentation:

Stage 2 Develop and Assess

ACP-2025-013

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Change History

Issue	Month/Year	Changes this issue (most recent first)
V1.1	Feb 2026	Subsection 5.4 added to clearly state IOA Evidence Gaps and how they will be resolved.
V1.0	Feb 2026	N/A – First Issue

Roles

Action	Role	Date
Produced	Airspace Change Specialist Airspace Change Compliance & Delivery	Feb 2026
Reviewed Approved	Manager Airspace Change Compliance & Delivery Airspace Change Compliance & Delivery	Feb 2026
Reviewed Approved	Head of Airspace Development Transformation Strategy & Development	Feb 2026
Reviewed Approved	Airspace Implementation Manager Transformation Strategy & Development	Feb 2026

Referenced Documents

Ref No	Name and description	Links
1	CAP1616 Edition 5.1	Link to CAP1616
2	CAA Airspace Change Portal Page	Link to Airspace Change Portal Page
3	CAP1616f Version 1.1	Link to CAP1616f
4	CAP1616i Version 1.1	Link to CAP1616i

1. Introduction

1.1 Background

1.1.1 This document forms part of the document requirements under the Civil Aviation Authority's (CAA) CAP1616 Airspace Change Process (Reference 1), specifically Stage 2 Develop and Assess:

- Design Options
- Design Principle Evaluation
- Options Appraisal (phase 1 – Initial) including safety considerations

1.1.2 The purpose of this document is to outline NERL's (NATS En-Route Ltd) comprehensive design options that address the Statement of Need. It will also describe the engagement NERL undertook with stakeholders and how the feedback from these activities fed into the design options. Additionally, it qualitatively assesses each of NERL's design options against its Design Principles (DP) in a Design Principle Evaluation (DPE), progressing those which fit best and, if appropriate, discounting those which fit least. Finally, it compares the progressed options against the Baseline ("Do Nothing") scenario as part of an Initial Options Appraisal (IOA).

1.2 Statement of Need

1.2.1 NERL submitted a Statement of Need to initiate this Airspace Change Proposal (ACP) in March 2025. The full document is published on the CAA's Airspace Change Portal (Reference 2) but extracts of the objective and key issues/opportunities are below. Note the following acronyms, Airspace Modernisation Strategy (AMS), Manchester Terminal Control Area (MTMA) and London Terminal Control Area (LTMA).

1.2.2 Objective: "The aim of this ACP is to modernise the airspace which interfaces between the London TMA (LTMA) and Manchester TMA (MTMA) (referred to hereafter as 'Midlands Airspace'), in line with the AMS.

The key objectives are to enhance route capacity and reduce complexity, providing environmental efficiencies where possible. This change aligns with the AMS."

1.2.3 Issue/Opportunity: "Midlands Airspace is a complex area of airspace. Sandwiched between the MTMA and LTMA, there are 2 primary flows of traffic to the north and south which traverse the 'spine' of the country, and a high volume of traffic.

Separate ACPs are underway to modernise both the LTMA and the MTMA (ACP-2020-043/ACP-2019-77) which will introduce systemised routings within the TMAs.

Current capacity within Midlands Airspace is restricted by the high level of controller workload, driven by high levels of tactical intervention required to maintain safety. This ACP seeks to optimise the route network in advance of the MTMA and LTMA changes, providing a systemised route structure, and where suitable, Free Route Airspace may be implemented.

Consideration has been given to combining this with either/both the extant TMA ACPs, however it is assessed as optimal to deliver this as a separate change. This will be an enabling change for both MTMA and LTMA ACPs."

1.3 Design Principles (DPs)

1.3.1 During Stage 1, NERL constructed a set of draft DPs that describe the qualities this proposal is seeking to achieve. Representative stakeholder groups were engaged, and stakeholder feedback was considered and used to develop the DPs into a final set. NERL submitted the final DPs alongside evidence of engagement, to the CAA in Aug 2025, which were subsequently approved. Full details of how the DPs were developed can be found in the Midlands Airspace Stage 1 document which can be accessed on the portal.

1.3.2 As the DPs have been used to inform the development and qualitatively evaluate the airspace design options, a copy of the final DPs can also be found in Appendix A Final Design Principles

1.4 Airspace Change Proposal Categorisation Level and Scope

1.4.1 Currently we are working on the basis that this airspace change proposal will not alter flight paths over the ground below 7,000ft. NERL therefore expects that this ACP will be classified as Level 2. The CAA will confirm the appropriate scaling level upon NERL passing through the Stage 2 Develop and Assess gateway.

1.4.2 As the expected scaling level is 2, NERL will or won't conduct certain activities as shown below.

1.4.3 NERL intends to:

- Design high-level airspace options (at and above 7,000ft)
- Conduct targeted engagement with relevant aviation stakeholders
- Produce en-route network CO2 emission analysis (during Stage 3)

1.4.4 NERL does not intend to:

- Design airspace that would alter flight paths below 7,000ft
- Proactively consult local communities
- Produce noise analyses

1.4.5 In addition to the above activities which won't be conducted based on ACP Level, NERL won't complete the Habitats Regulations Assessment early screening criteria form found in Chapter 9 of CAP1616I (Reference 4). This is usually done during Stage 2, however as this proposal won't make any changes below 3,000ft, it was agreed in the assessment meeting with the CAA that this is not required.

2. Design Option Development

2.1 Constraints and considerations

2.1.1 Before NERL could create any design options (conceptual or detailed), the constraints on the design and any considerations had to be understood.

2.1.2 There are a number of constraints on a new airspace design given the change area and DPs. For example:

- traffic flows into/out of the change area
- limiting the impact on abutting sectors of airspace
- not changing tracks over the ground below 7,000ft; which by extension
  - limits change to some Standard Instrument Departures (SID) in the area
  - prohibits change to other SIDs in the area

2.1.3 In addition to the above constraints, there are a number of design considerations which limit scope for multiple design options:

- Forecast traffic demand
- neighbouring airspace users such as the Ministry of Defence (MoD), gliding sites, parachute sites
- work completed to date on MTMA and LTMA airspace modernisation projects

2.2 Initial Design Development

2.2.1 Once the design constraints and considerations were understood, NERL airspace change Subject Matter Experts (SMEs) qualitatively assessed three high-level concepts to identify if any were suitable for this airspace change. The descriptions and evaluations can be seen in Table 1.

Table 1 Airspace design concepts assessed in initial design development

Concept	Description	Evaluation
Free Route Airspace (FRA)	Allows aircraft to fly between defined entry and exit points without having to follow fixed airways or routes.	Whilst this provides efficiency and flexibility benefits, current Air Traffic Management (ATM) system limitations restrict the implementation of FRA. Additionally, FRA would markedly increase complexity which would limit capacity, so this concept was discounted.
Full systemisation	Aircraft follow a structured set of predefined routes, levels, and separation standards.	This provides predictability of traffic flows, however the high volume of traffic in this airspace would significantly impact the environmental efficiency of this airspace, as it would not optimise the most efficient routings, so this concept was discounted.
Hybrid systemisation	The arrivals and departures from the TMAs are fully systemised, and traffic overflying the volume of airspace are largely permitted to flight plan the most efficient routings.	This provides the balance of structured airspace helping to manage complexity for efficient and predictable operations between TMAs, and flexible flight planning for overflying traffic. This would provide optimised routings, so this concept has been progressed for option development.

2.3 Further Development

2.3.1 After a high-level concept was selected, Hybrid Systemisation, NERL airspace change SMEs further developed it into two design options for further analysis.

2.3.2 The airspace change process (CAP1616) acknowledges that sometimes there will only be limited scope for multiple design options, with few realistic options available. For example, due to the physical constraints of adjacent airspace or flight procedures.

2.3.3 In this case, due to the geographical scope of this proposal and therefore the large number of potential route positions, only two design options were developed, and these remain conceptual at this stage.

2.3.4 CAP1616 also includes that sponsors may consider radical options during design development. Whilst NERL has considered if any other options could enable additional benefits, no radical options have been developed.

2.3.5 The two options developed address the Statement of Need as they have the potential to enable integration with the MTMA and LTMA Modernisation projects and optimise the change area. Although the designs have been developed with the DPs in mind, the extent to which the options meet the DPs will be assessed in the DPEs.

3. Design Options

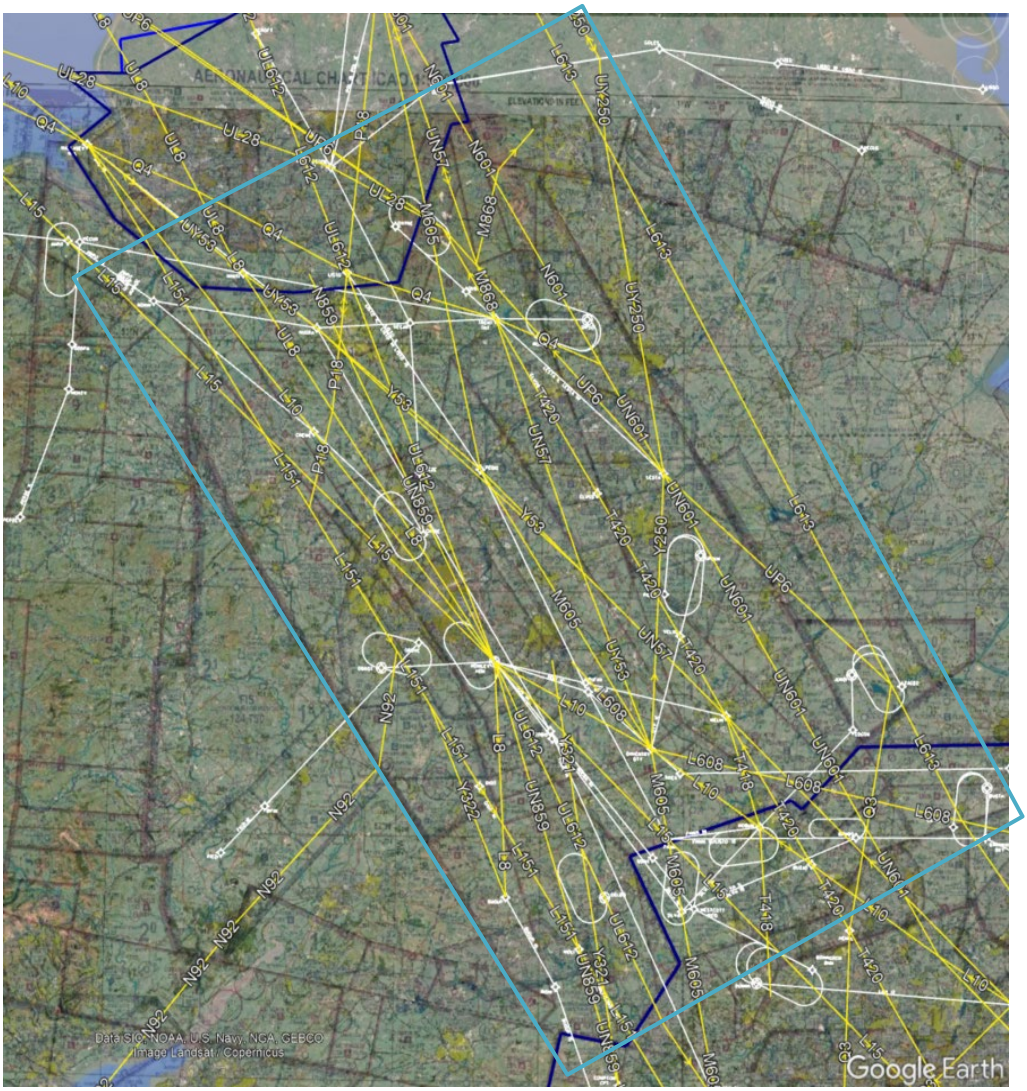
3.1 Baseline ("Do Nothing")

3.1.1 The baseline scenarios are descriptions of the 'Midlands Airspace' if an airspace change were not to take place in the intended implementation year and 10 years after implementation.

Airspace Design

3.1.2 The existing route structure consists of Air Traffic Service (ATS) Routes, flight plannable Direct Routes (DCTs) and Standard Arrival Routes (STARs). Figure 1 shows the existing route structure within the change region, with converging ATS routes based on ground-based navigation aids.

Figure 1: ATS routes (yellow), STARs (White), 'Midlands Airspace' (light blue), LTMA and MTMA (dark blue)



3.1.3 The primary ATS routes within scope are: L8, UL8, L10, L15, L151, L28, UL28, L608, L612, UL612, L613, M605, UM605, M868, UM868, N57, UN57, N859, UN859, N601, UN601, N92, P6, UP6, P18, Q3, Q4, UQ4, T418, T420, Y250, UY250, Y321, Y322, Y53, UY53 [1]

3.1.4 Arrivals to MTMA, LTMA, and Midlands airports connect to the network via STARs.

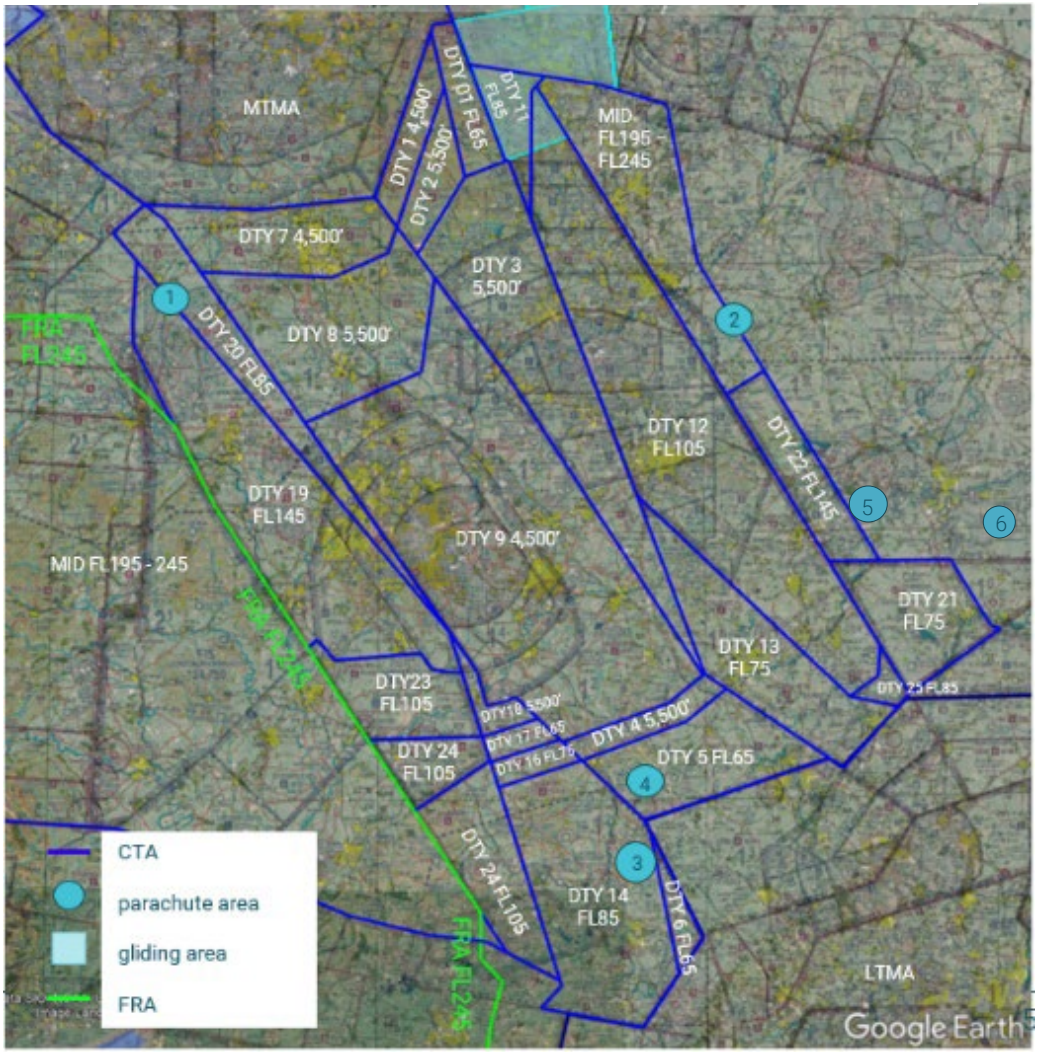
3.1.5 Current airport departure procedures (SIDs) connect to the network. These are not within scope of the change however connectivity will be optimised.

3.1.6 Vertical scope is Flight Level (FL)70 – FL660.

[1] The proposed changes will require connectivity with other ATS routes and DCTs within the wider network, so the change is not limited to these routes.

Controlled Airspace (CAS)

Figure 2: Current CAS, parachute areas, gliding areas and FRA



CAS

- Midlands Control Area (CTA): Class C airspace FL195 - FL245
- Daventry (DTY) CTA 1 – CTA 20: Class A airspace, various bases up to FL195
- Daventry (DTY) CTA 21 – CTA 25: Class C airspace, various bases up to FL195

Parachute Areas within scope

(1) Tilstock parachute site (SFC – FL150)
(2) Langar Parachute Site (SFC – FL150)
(3) Weston-on-the-Green parachute site (SFC – FL120)
(4) Hinton on the Hedges (SFC –FL65)
(5) Sibson (SFC – FL150)
(6) Chatteris (SFC – FL150)

Gliding Areas within scope

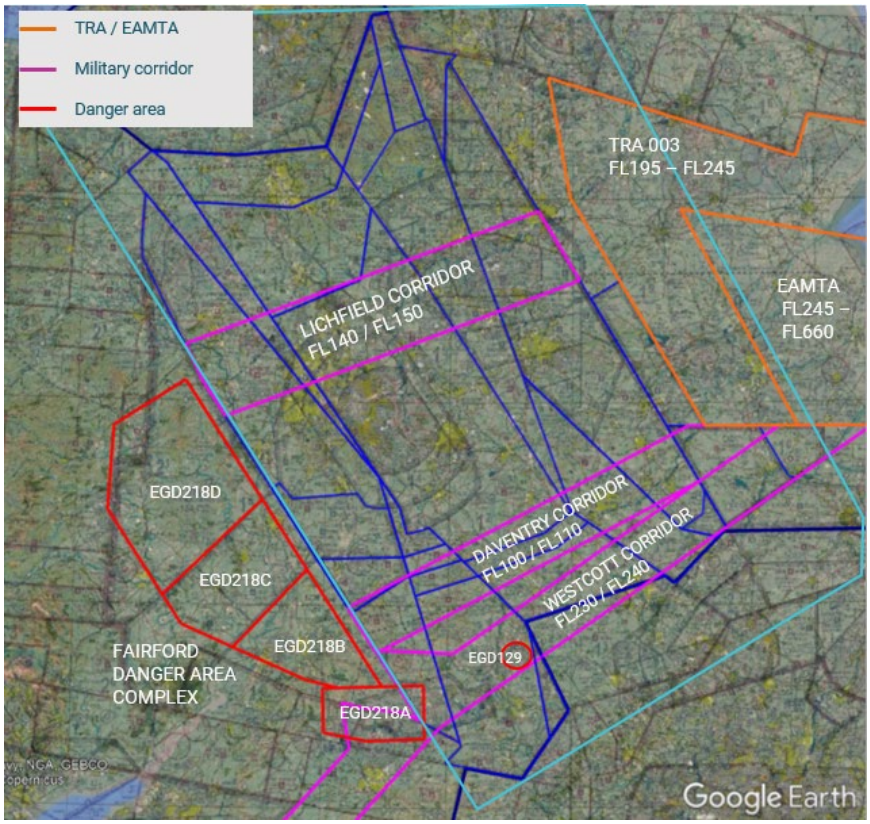
- Camphill Box (FL85 – FL100)

FRA (out of scope)

To the west of the scope area, airspace above FL245 is FRA. This denotes the west boundary of the change area and is out of scope.

Military Airspace

Figure 3: Extant military airspace within area of scope



Temporary Reserved Area: (TRA003): FL195 – FL245

East Anglia Military Training Area: (EAMTA): FL245 – FL660

Military Corridors

- Lichfield Corridor FL140 / FL150
- Daventry (DTY) Corridor FL100 / FL110
- Westcott (WCO) Corridor FL230/ FL240

Danger Areas

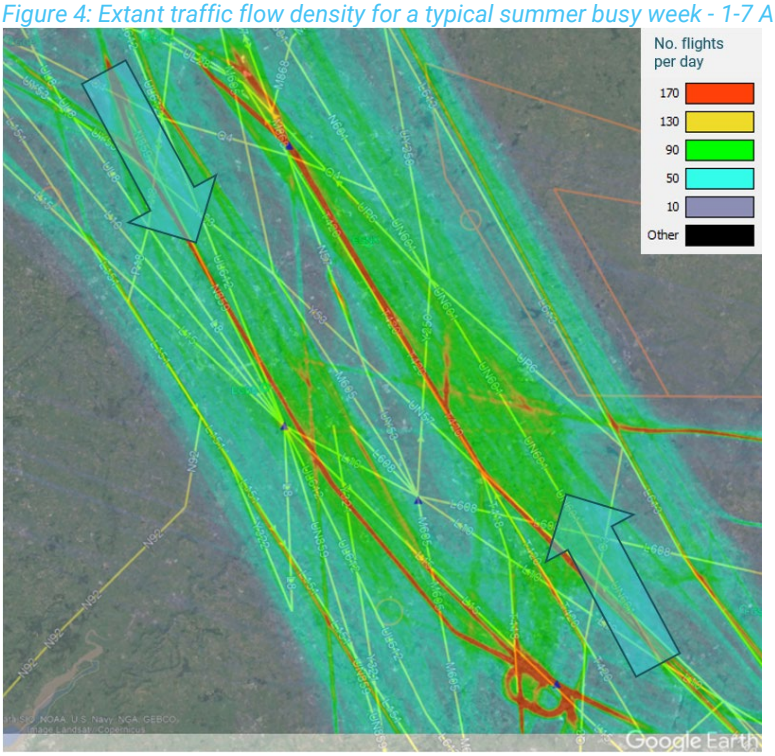
Fairford Danger Complex:

- EGD218A SFC – FL75
- EGD218B outside change area of scope
- EGD218C outside change area of scope
- EGC218D outside change area of scope

EG D129 Weston-on-the-Green SFC – FL120

Airspace Usage

Figure 4: Extant traffic flow density for a typical summer busy week - 1-7 August 2024



3.1.7 The airspace is split into two main components, one predominantly southbound at the western section of the airspace and one predominantly northbound to the east. The vast majority of traffic follows the northbound or southbound flow.

3.1.8 Southbound traffic (west flow) includes:

- arrivals into LTMA, Wessex Group, Solent Group and Farnborough airfields
- departures from MTMA, Birmingham, East Midlands, Northern UK/Irish airfields
- southbound London Flight Information Region (FIR)/Upper Information Region (UIR) overflights

3.1.9 Northbound traffic (east flow) includes:

- departures from LTMA, Wessex Group, Solent Group and Farnborough airfields
- arrivals into MTMA, Birmingham, East Midlands, Northern UK/Irish airfields
- northbound London FIR/UIR overflights

Forecast Traffic

3.1.10 Table 2 shows the forecast traffic growth for the change area across the 10-year reference period. Actual traffic throughput during 2024 has been included for comparison purposes.

Table 2: Forecast traffic for the change area - NATS NOV25 Long Term Forecast Extended

Year	Traffic levels
2024 (current day)	484,856
2028 (implementation)	515,043
2029	520,194
2030	523,315
2031	528,025
2032	529,609
2033	531,727
2034	535,449
2035	539,733
2036	544,051
2037 (10 years post-implementation)	548,403

Forecast Fleet Mix

3.1.11 The predominant aircraft type using Midlands Airspace is medium jets, mostly comprised of aircraft from the Airbus A320 family and the Boeing B737 family.

3.1.12 16% of traffic is heavy airliners, predominantly B777/B787/B767 and A330/A350 aircraft.

3.1.13 The proportions of aircraft type are expected to remain similar to today with traffic growth. A breakdown of 2024 data for the change area is shown in Table 3.

Table 3: 2024 traffic by weight category

Weight Category	Count (2024)	% all traffic
Super	3,354	1%
Heavy	79,304	16%
Medium	382,340	79%
Light/Small	19,858	4%

Operational efficiency/complexity/delays:
Workload

3.1.14 Given the current design, most aircraft require radar vectors and multiple level clearances to maintain safety and manage traffic demand.

3.1.15 An increase in traffic would increase ATC workload, limiting capacity, these factors would likely worsen with the forecasted increase in traffic levels.

Delay

3.1.16 Currently an ATC bottleneck, with a high level of complexity and traffic demand in the busy corridor connecting airspace between LTMA, Oceanic/Scottish domestic airspace and Dublin

3.1.17 The current design does not facilitate efficient operations; the forecasted increase in traffic levels would increase delay, and likely more regulations would need to be applied within the network to manage traffic levels.

Environmental Impacts

Fuel burn / CO_2e:

3.1.18 With current day design, environmental impacts will likely worsen as traffic increases, as tactical routing efficiencies will likely be limited due to the increased complexity, with less continuous climbs / descents also likely.

3.2 Option 1 – 10 Parallel Routes

Description

3.2.1 This design has 10 separated ATS routes: 5 southbound & 5 northbound.

3.2.2 Traffic to and from the LTMA/MTMA may flight plan one of the 10 ATS routes, according to departure and destination and/or UK entry/exit fixes.

3.2.3 All other traffic overflying the airspace volume, will be permitted to flight plan more efficient trajectories by means of flight plannable DCTs.

3.2.4 All routes are separated to CAP1385 standards, maximising the airspace and capacity opportunities. This design option provides the optimal solution for capacity for the airspace, minimising environmental impacts.

3.2.5 An indicative illustration of this design concept can be seen in Figure 5.

Figure 5 Option 1 - 10 Parallel Routes (Indicative image)

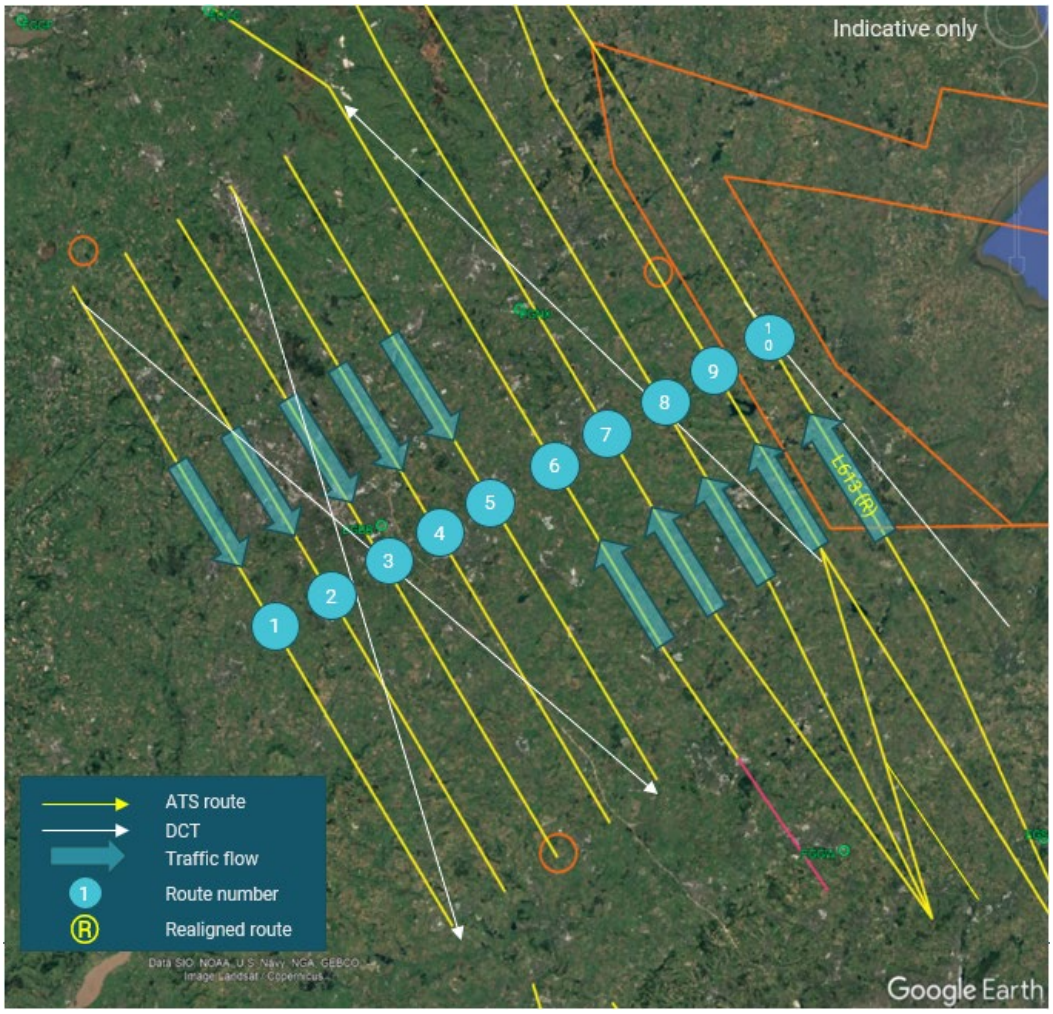
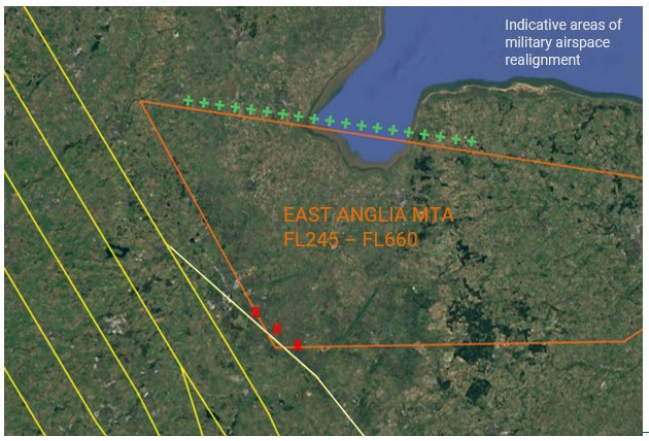
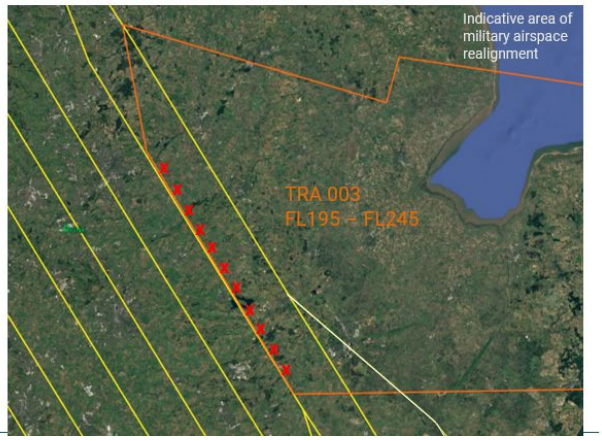


Figure 6: Proposed changes to military airspace (Indicative images)

EAMTA (FL245 – FL660) Proposed changes:
A realignment to south-west corner (shown x) would be required to provide route separation, enabling more efficient routings H24.
To offset this, the MTA could be extended to the north as shown (++)



TRA 003 (FL195 – FL245) Proposed changes:
A lateral realignment of the western edge would be required (shown with x) to provide separation from proposed ATS route 9.
This would be the minimal airspace required for route separation.



Benefits

3.2.6 This design is expected to enable various benefits both in the implementation year and 10 years post:

- Enhanced predictability for LTMA/MTMA arrivals and departure flows
- Maximises reduction in use of controller intervention against current day
- Provides optimal flight profiles for traffic transiting the airspace
- 3 routes for LTMA departures – increased capacity, reduced complexity/workload
- Dedicated route for EGNM/NJ arrivals - provides future growth potential for MTMA (also future proofing for potential reopening of EGCN)
- Reduced complexity on the busy northbound sectors and therefore reduced delay
- Fully compatible with MTMA design work to date
- Additional 10th route gives benefits of greater systemisation and therefore lower complexity for the northbound route structure

Considerations

3.2.7 Design aspects that need to be considered to minimise impacts to other airspace users:

- Additional CAS required above FL100
- Realignment of EAMTA and TRA003 required

Stakeholder feedback

3.2.8 Some stakeholders (airports) assess the potential impacts as being potentially positive, with capacity gains highlighted as a benefit.

3.2.9 GA users have flagged concerns around the potential CAS changes, and a potential negative impact. At this stage, any additional CAS requirements are to be determined, and we will continue to work with these airspace users to minimise impacts.

3.2.10 The Military assess the potential impacts as 'clearly negative', although they acknowledge the benefits for civil airspace and will seek to work closely with NERL to develop the design option to mitigate the impacts.

3.2.11 Overall, stakeholders either agree Option 1 is the preferred option or indicate they are unsure, with exception of the MoD.

3.3 Option 2 – 9 Parallel Routes

Description

3.3.1 This design has 9 separated ATS routes: 5 southbound & 4 northbound.

3.3.2 Traffic to and from the LTMA/MTMA may flight plan one of the 9 ATS routes, according to departure and destination and/or UK entry/exit fixes.

3.3.3 All other traffic overflying the airspace volume, will be permitted to flight plan the most efficient trajectories by means of flight plannable DCTs.

3.3.4 Existing L613 (route 9) is the outer route to the east and remains as today, this creates an inefficient spacing between routes 8 & 9, which is not optimised. Routes are generally designed with 6.8NM separation.

3.3.5 An indicative illustration of this design concept can be seen in Figure 7

Figure 7 Option 2 - 9 Parallel Routes (Indicative image)

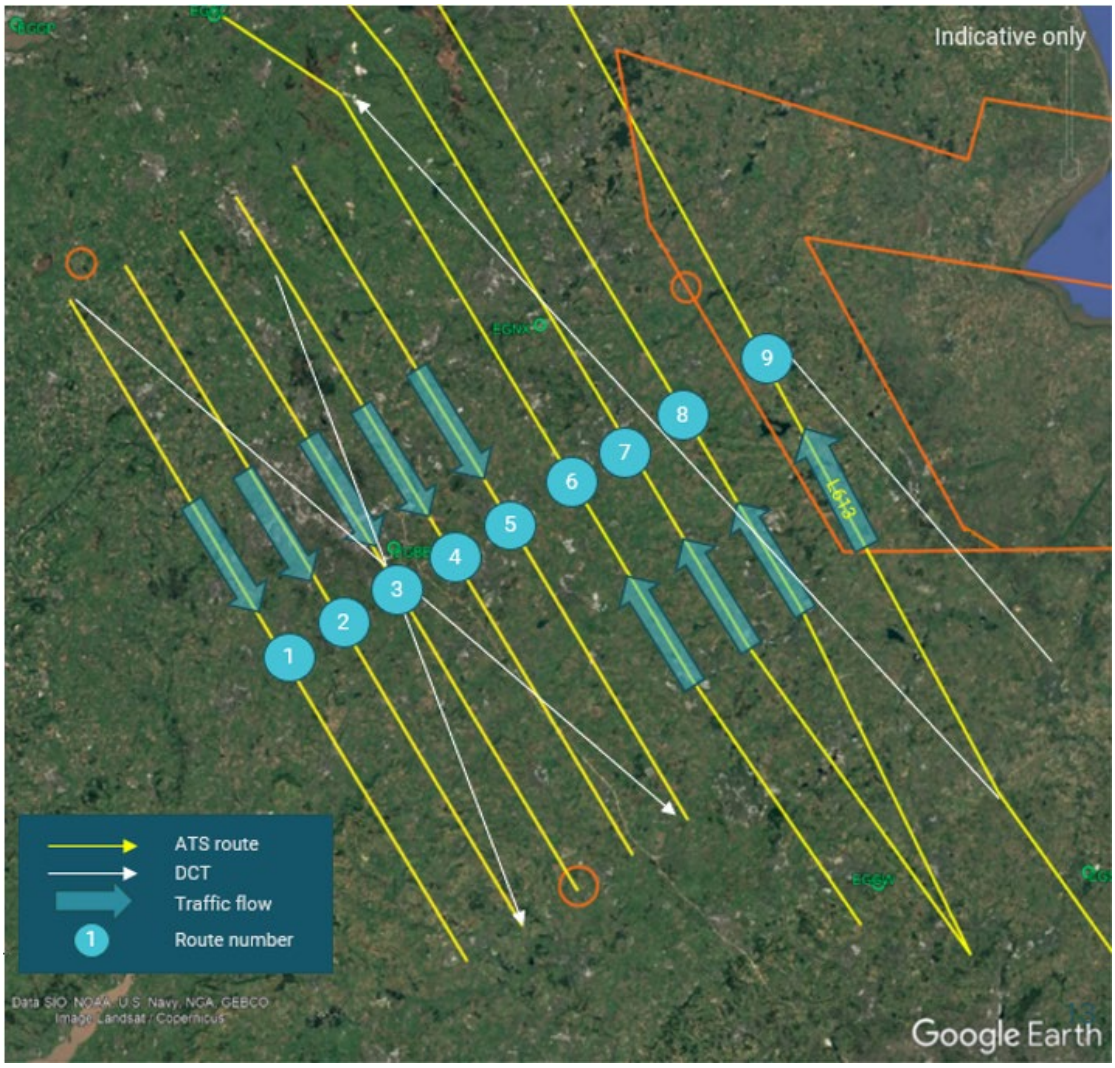
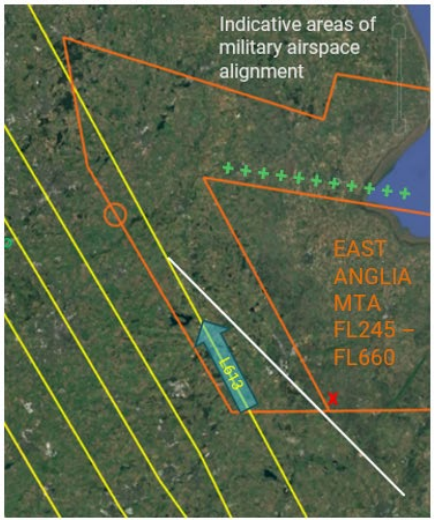


Figure 8: Proposed changes to military airspace (indicative image)

EAMTA (FL245 – FL660) Proposed changes:
A realignment to south-west corner (shown x) would be required to provide route separation, enabling more efficient routings H24. To offset this, the MTA could be extended to the north as shown (++)



The white line is indicative of a flight plannable DCT which is currently available dependent on EAMTA activity, as it is less than 5NM from boundary.

Benefits

3.3.6 This design is expected to enable various benefits both in the implementation year and 10 years post:

- Predictability for LTMA/MTMA arrivals and departure flows, increasing capacity and resilience over current day
- Reduction in use of controller intervention against current day, reducing workload and therefore increasing capacity over current day
- Provides optimised flight profiles for traffic transiting the airspace, improving fuel burn and CO_2e emissions over current day
- No requirement for additional CAS
- No changes required for TRA003 volume

Considerations

3.3.7 There are design aspects that may not be optimal for various organisations:

- Limits LTMA departures to 2 routes (will increase the complexity, and limit capacity gains)
- Not fully compatible with future MTMA design work to date
- EGNM/NJ arrivals will be sharing the MTMA route
- ATS routes are separated to CAP1385 standard, other than routes 8 & 9, which are not optimally efficient
- Realignment of EAMTA required

Stakeholder feedback

3.3.8 One stakeholder assesses the potential impacts as being potentially positive.

3.3.9 Some stakeholders assess this option as having no impact, as CAS does not change, and an assessed ambivalence on capacity benefits.

3.3.10 A potential negative impact is assessed by stakeholders who have concerns around potential CAS changes, and a potential negative impact, with capacity benefits being unclear.

3.3.11 The Military assess the potential impacts of this option as 'possibly negative', although they acknowledge the benefits for civil airspace and will seek to work closely with NERL to develop the design option to mitigate the impacts.

3.4 Stakeholder Feedback – We asked, you said, we did

3.4.1 The design options presented in this document were tested through two-way engagement with an extended list of stakeholders than those involved in Stage 1. A full list of these can be found in Appendix B Summary of Stakeholders.

3.4.2 A briefing pack was sent via email to targeted stakeholders, describing the change objectives, baseline, design option development, design options, and potential impacts.

3.4.3 Stakeholders were asked to provide feedback via a simple online form, indicating their response (agree/disagree or positive/negative impact and any comments) to both the baseline and design options. The full list of questions included in the form can be found in Appendix C Feedback Form. Stakeholders were also advised that a briefing could be arranged on request.

3.4.4 A five-week response window was provided (11th December 2025 – 15th January 2026); stakeholders who had not responded with 1 week remaining were sent a reminder email on 9th January 2026.

3.4.5 This approach was assessed as appropriate and proportionate for targeted industry stakeholders with a 5-week period sufficient to allow for the holiday period within the timeframe.

3.4.6 Annex A: Engagement Evidence contains the briefing pack, notification and reminder email, as well as responses received.

3.4.7 Three stakeholders requested a briefing, summarised in Table 4 below.

3.4.8 Notes summarising all engagement activities have also been submitted to the CAA as part of Annex A: Engagement Evidence and a redacted version uploaded to the portal (Reference 2).

Table 4 Stakeholder Engagement Activities

Engagement Activity	Date	Attendees	Summary of Activity
Stage 2 engagement briefing – requested by Stakeholder	07.01.26	Birmingham Airport NERL	NERL presented engagement material. Potential impacts/benefits for Birmingham and feedback deadline discussed.
Stage 2 engagement briefing – requested by Stakeholder	07.01.26	British Gliding Association (BGA) NERL	NERL presented engagement material. Potential CAS discussed. NERL reminded BGA of the feedback deadline.
Stage 2 engagement briefing – requested by Stakeholder	07.01.26	MoD NERL	NERL presented engagement material. Potential CAS and realignment of EAMTA and TRA003 discussed. NERL reminded MoD of the feedback deadline.

3.4.9 Responses were received from 7 stakeholders, all responding via the form provided.

3.4.10 The first question posed, asked if stakeholders agreed with the baseline presented and all respondents did. Therefore, no changes have been made based on those responses. However, two parachute sites were noted by the MoD during a briefing and these have been added (Chatteris and Sibson).

3.4.11 The below tables state the remaining questions asked (“we asked”), summarise the feedback received (“you said”) and provide NERLs response (“we did”):

Table 5 Stakeholder Feedback - Impact of Option 1 - 10 Parallel Routes

Assessed Impact (theme)	Organisation	Rationale (Summarised)	NERL Response
Potential Positive Impact (capacity)	Gatwick Airport Limited	More direct routes available with balance between NW and SE routes potentially increases capacity.	Thank you for your feedback.
Potential Positive Impact	Manchester Airports Group (MAG)	If waypoints differ, tracks could change below 7,000ft for aircraft departing Manchester/ East Midland airports	The design will be developed so that there is no change to tracks over the ground below 7,000ft. This is a constraint on the design.
Potential Negative Impact (CAS)	Air Mobility Force	Main concern is CAS ivo Brize Norton. Engagement material suggests potential lowering to FL70. NVG training tends to remain at Brize due to ability to turn off runway lights.	There will be a CAS review during Stage 3 and NERL will only request the minimum amount of airspace necessary to deliver an efficient design in-line with our DPs. We plan to discuss this topic further during Stage 3.
Potential Negative Impact (CAS)	BGA	L975 crossing is not shown in engagement material and illustrations are too small. Base of Camphill Wave Box (is shown) is FL85, Class G to the East enables climb. Proposed base of DTY CTA is not clear at this stage, no problem if above FL100. Existing extension of the LTMA North & Eastwards with a base of FL75 has caused problems. Class C airspace would reduce negative impact compared to Class A.	We provided a high-level figure of the change area in our engagement material to show the change area and allow the baseline to be verified. There will be a CAS review during Stage 3 and NERL will only request the minimum amount of airspace necessary to deliver an efficient design in-line with our DPs. We plan to discuss this topic further during Stage 3.
Potential Negative Impact (CAS)	British Parachute Schools Ltd / t/a Skydive Langar	Prefer base of CAS for routes 8,9,10 to be above FL160 as we operate up to FL150. If ATS service required, it would increase controller workload as we operate 60-70 flights per day on weekends.	There will be a CAS review during Stage 3 and NERL will only request the minimum amount of airspace necessary to deliver an efficient design in-line with our DPs. We plan to discuss this topic further during Stage 3.

Potential Negative Impact (capacity)	easyJet	How does the route structure complement FRA and the wider modernisation programme? Not immediately clear how ACP delivers meaningful benefit, e.g. capacity.	By introducing hybrid systemisation (systemised parallel routes alongside DCTs) we can improve the efficiency of the airspace, integrate with current or planned FRA airspace (eg Scottish airspace), and optimise the interface for the MTMA and LTMA modernisation projects. Both design options create systemised routes which enhance predictability leading to less controller workload per flight. Option 1 provides a greater benefit than Option 2 as there are more LTMA departure routes available.
Clear Negative Impact (MIL airspace)	MoD via Defence Airspace and Air Traffic Management (DAATM)	Requirement to reshape EAMTA and TRA003 will remove currently available, heavily utilised airspace. Appreciate positive impact for route traffic. Further discussions with more detail on amount of airspace to change (taken and given) are needed to understand and mitigate impact to MoD.	NERL will only request the minimum amount of airspace necessary to deliver an efficient design in-line with our DPs. We plan to discuss this topic further during Stage 3.

Table 6 Stakeholder Feedback - Impact of Option 2 - 9 Parallel Routes

Assessed Impact (theme)	Organisation	Rationale (Summarised)	NERL Response
Potential Positive Impact	MAG	If waypoints differ, tracks could change below 7,000ft for aircraft departing Manchester/ East Midland airports	The design will be developed so that there is no change to tracks over the ground below 7,000ft. This is a constraint on the design.
No Impact (capacity)	Gatwick Airport Limited	Disbalance between arriving and departing routes may result in congestion.	Thank you for your feedback.
No Impact (CAS)	BGA	Option 2 does not change CAS.	Thank you for your feedback.
Potential Negative Impact (CAS)	Air Mobility Force	As with Option 1, main concern is CAS ivo Brize Norton. Engagement material suggests potential lowering to FL70. NVG training tends to remain at Brize due to ability to turn off runway lights.	There will be a CAS review during Stage 3 and NERL will only request the minimum amount of airspace necessary to deliver an efficient design in-line with our DPs. We plan to discuss this topic further during Stage 3.
Potential Negative Impact (CAS)	British Parachute Schools Ltd / t/a Skydive Langar	Prefer base of CAS for route 9 to be above FL160 as we operate up to FL150. If ATS service required it would increase controller workload as operate 60-70 flights per day on weekends.	There will be a CAS review during Stage 3 and NERL will only request the minimum amount of airspace necessary to deliver an efficient design in-line with our DPs. We plan to discuss this topic further during Stage 3.
Potential Negative Impact	easyJet	How does the route structure complement FRA and the wider modernisation programme? Not immediately clear how ACP delivers meaningful benefit, e.g. capacity.	By introducing hybrid systemisation (systemised parallel routes alongside DCTs) we can improve the efficiency of the airspace, integrate with current or planned FRA airspace (eg Scottish airspace), and optimise the interface for the MTMA and LTMA modernisation projects. Both design options create systemised routes which enhance predictability leading to less controller workload per flight. Option 1 provides a greater benefit than Option 2 as there are more LTMA departure routes available.
Potential Negative Impact (MIL airspace)	MoD (DAATM)	Whilst impact is clearly lower than Option1, smaller adjustment to EAMTA will have some impact, needs to be quantified through further discussion.	NERL will only request the minimum amount of airspace necessary to deliver an efficient design in-line with our DPs. We plan to discuss this topic further during Stage 3.

Table 7 Stakeholder Feedback - Preferred Option

Organisation	Response to "Do you agree that Option 1 – 10 Parallel Routes is the preferred option?"	Rationale (Summarised)	NERL Response
Air Mobility Force	Yes	Lowering of base of CAS would have greater impact than introducing parallel routes.	There will be a CAS review during Stage 3 and NERL will only request the minimum amount of airspace necessary to deliver an efficient design in-line with our DPs. We plan to discuss this topic further during Stage 3.
Gatwick Airport Limited	Yes	As per previous comments.	Thank you for your feedback.
MAG	Yes	In terms of complexity reduction/capacity maximisation this seems the better option as more tracks separated.	Thank you for your feedback.
BGA	Unsure	Understand why preferred for sponsor, don't believe that's the case for gliding (see previous comments).	There will be a CAS review during Stage 3 and NERL will only request the minimum amount of airspace necessary to deliver an efficient design in-line with our DPs. We plan to discuss this topic further during Stage 3.
British Parachute Schools Ltd / t/a Skydive Langar	Unsure	Don't know which is preferable but appreciate need to modernise airspace and increase traffic flow.	Thank you for your feedback
easyJet	Unsure	Unsure organisation will gain benefits from proposed structure.	Both design options would create systemised routes which will enhance predictability. Option 1 would enable capacity benefits to be realised but Option 2 would constrain capacity gains due to only have two LTMA departure routes available.
MoD (DAATM)	No	Option 1 is optimal to route traffic but can't be supported as preferred by MoD until exact extent of EAMTA and TRA003 adjustments and how impact to military operations will be reduced/mitigated are known.	NERL will only request the minimum amount of airspace necessary to deliver an efficient design in-line with our DPs. We plan to discuss this topic further during Stage 3.

Table 8 Stakeholder Feedback - Additional Feedback or Information

Organisation	Summarised response to "Is there any other feedback or information you would like us to know?"	NERL Response
BGA	Transition altitude is an issue, it requires additional buffers which must have knock-on impacts to attempts to minimise CAS. Not sure CAA likely to fix it, needs to be awareness that we pay for uncertainty in extra CAS.	The transition altitude is out of scope for this airspace change but there will be a CAS review during Stage 3.
Gatwick Airport Limited	Rather than 5 routes in either direction, have smaller sets been considered? Could provide shorter tracks (CO_2 savings) but may have coordination and congestion implication.	Thank you for your suggestion. Smaller sets of routes including a greater number northbound than southbound or changing the use of key routes at certain times to suit traffic flows have been explored. However the data, SME feedback, and system limitations mean that these solutions were not progressed.
MAG	1. Requested clarity on STARs to be changed and if outbound routes can be changed without impacting STARs 2. Could the intent of 'current airport departure procedures (SIDs) connect to the network. These are not within scope of the change however connectivity will be optimised.' be clarified. 3. Concern that NERL's ability to vector below 7,000ft and change proposed to flight planned routes, could result in change of track at/below 7,000ft. 4. Need to avoid confusion between 'Midlands Airspace' and 'East Midlands'. 5. There is an opportunity to amend Class A airspace to Class C, this would have no impact on ATC for Manchester or East Midlands Airports. 6. Assume NERL will make necessary changes to Airport charts and respective sections of the Aeronautical Information Publication (AIP).	1. The STARs listed as potentially impacted in the engagement material are the only ones we envision changing at this stage. 2. Although the SID is not within scope of this ACP, how traffic integrates with the high-level network after leaving the SID will be optimised. 3. The design will be developed so that there is no change to tracks over the ground below 7,000ft. This is a constraint on the design. 4. 'Midlands Airspace' is defined in the engagement material to indicate that this is a bespoke term for the area within scope of this change. 5. There will be a CAS review during Stage 3 and NERL will only request the minimum amount of airspace necessary to deliver an efficient design in-line with our DPs. 6. NERL will make necessary changes to the relevant sections of the AIP with the owner of that sections consent.
MoD (DAATM)	Brief on 7th Jan was very useful. Glad to hear military use of radar corridors (Lichfield, Daventry and Westcott) will be unaffected and lateral extent increased where required to enable continued use. Glad to hear no base reduction on western edge of change area (DTY 19,23,24) and no additional CAS beneath TRA003 as this would bring additional negative impact.	Thank you for your feedback.

3.4.12 No design options were changed as a result of stakeholder feedback, but feedback was carried forward to the DPE for consideration by NERL SMEs. All options progressed to DPE. Additional data/modelling to be conducted for the Stage 3 Full Options Appraisal is listed in 5.4.

4. Design Principle Evaluation (DPE)

4.1 Methodology and Criteria

4.1.1 Each design option has been assessed against the DPs in a DPE. This exercise allows the sponsor to see which design options best meet the DPs set in Stage 1 of the Airspace Change Process.

4.1.2 Each DPE table includes a Met/ Partial/ Not Met status for each DP. For ease of reading, these statuses have been coloured, Not Met is Red, Partial is Amber, and Met is Green.

4.1.3 Table 9 shows the assessment criteria for conducting the DPE. SMEs[2], in this case air traffic control experts and airspace change experts, list topics associated with each DP and qualitatively test how each option would react to these topics, describing how a Not Met/ Partial/ Met status is reached.

Table 9 Design Principle Evaluation assessment criteria

DP Priority	DP	SME subjective assessment topics, including but not limited to	Not Met	Partial	Met
A	MDP Safety – The airspace change proposal must maintain a high standard of safety and should seek to enhance current levels of safety. (Note: Not Met could not be solved by mitigation, Partial may be solved by mitigation)	Human Performance (Air Traffic Control Officer (ATCO) control-ability) Human performance (pilot fly-ability) Instrument Flight Procedures (IFP) (fly-ability) Surrounding airspace users (inside/ outside of CAS) Impact if ATM tools fail	Unacceptable level of safety risk	Diminished – Issue(s) identified could result in an elevated level of safety risk when compared to today's operation	Enhanced – improvement over today's level of safety OR Maintained – safety risk could be maintained within acceptable levels of today's operation

[2] Stakeholder feedback was used to inform the evaluation of one or more DPs as our SMEs take that feedback, add it to their wider knowledge and experience, and apply their combined judgment to the DPE for each option. The conceptual nature of the design options means that design decisions on each subject may not be possible at this stage. However, all feedback is considered by the SMEs in the round and may also be carried forward into later stages as the concepts develop into more detailed options.

B	DDP Operational (Capacity) – The airspace change proposal should provide the greatest capacity benefits	Overall ATCO workload Overall network capacity Predictability Sectorisation Traffic throughput	Reduced/ Maintained – Design option unable to support the forecast traffic loading due to reduced or maintained capacity when compared to today's operation. Design option increases or maintains ATCO workload.	Increased– Design option supports the forecast traffic loading for the reference period but does not maximise benefits when compared to today's operations. Design options decreases ATCO workload.	Maximised – Design option supports the forecast traffic loading beyond the reference period and maximises benefits when compared to today's operations. Design option decreases ATCO workload.
B	BDP Technical (Future Airspace Enabler) – The Midlands Airspace design will provide a compatible and optimised interface with the MTMA and LTMA modernisation projects.	Compatibility with MTMA and LTMA projects Optimised routings	Incompatible and sub-optimal – Design option is not compatible with MTMA and/or LTMA modernisation projects and does not provide an optimised interface.	Compatible but suboptimal – Design option is compatible with the MTMA and LTMA modernisation projects but does not provide an optimised interface.	Compatible and optimised – Design option is compatible with the MTMA and LTMA modernisation projects and provides an optimised interface.
B	MDP Policy – The airspace change proposal should not be inconsistent with relevant legislation, the CAA's airspace modernisation strategy (AMS) or Secretary of State and CAA's policy and guidance.	AMS "Ends" Strategic Objectives Safety Integration of diverse users Simplification Environmental sustainability CAA Policies	Misaligned with policy – Design option has no or limited alignment with the AMS and/or doesn't meet other legislation/policies.	Partially aligned with policy – Design option has some alignment with the AMS and meets other legislation/policies.	Aligned with policy – Design option is aligned with the AMS and other legislation/policies.

C	MDP Environment – The airspace change proposal should deliver the Government's key environmental objectives with respect to air navigation as set out in the Government's Air Navigation Guidance 2017.[3]	Holding Overall CO_2 emissions Track mileage	Doesn't meet objectives – Design option worsens environmental impacts compared with today's operation.	Partially meets objectives – Design option maintains the level of environmental impact when compared with today's operation.	Meets objectives – Design option delivers environmental benefits when compared with today's operation.
C	DDP Technical (Performance based navigation) – The proposed routes (Instrument flight procedures/ air traffic service routes) should be designed to enable efficiency benefits by using an appropriate standard of performance-based navigation (PBN).	Airspace requirement vs Requirement Navigation (RNAV) rating Require aircraft equipage standards	Efficiency reduced – Design option uses PBN in a way that reduces efficiency when compared to today's operation.	Efficiency maintained – Design option uses PBN in a way that maintains efficiency when compared to today's operation.	Efficiency benefits – Design option uses PBN in a way that enables efficiency benefits when compared to today's operation.
C	DDP Technical (Ministry of Defence requirements) – The airspace change proposal should be compatible with the requirements of the Ministry of Defence.	Overall amount of danger area available Amount of time danger area available Flexible use airspace provision Change to access between danger areas Safety based impacts Radar corridor access	Not compatible - Major elements are not compatible with the requirements of the MoD. Negative impacts not minimised.	Partially compatible - Minor elements are not compatible with the requirements of the MoD. Negative impacts minimised.	Compatible - Design is compatible with the requirements of the MoD. No negative impacts.

[3] Note: Due to the airspace change not altering tracks over the ground below 7,000ft, it is not expected that there will be any significant environmental impacts to stakeholders on the ground due to noise, visual intrusion and local air quality.

C	DDP Technical (Accessibility for all airspace users) – The airspace change proposal should consider the impacts of operators and owners of all classes of aircraft, including general aviation and other civilian airspace users.	Change to boundaries of CAS Changes to CAS classification Safety based impacts	Negative impacts – Design option leads to negative impacts on other airspace users.	Maintain/ Minimise impacts – Similar CAS to today or negative impacts minimised but requires changes to other airspace users' activities.	Benefits – Positive impacts to other airspace users' current activities.
C	DDP Technical (Controlled Airspace) – The volume and classification of controlled airspace required for the provision of air traffic control services to Instrument Flight Rules (IFR) flights should be the minimum necessary to deliver an efficient airspace design, taking into account the needs of other airspace users.	Classification of CAS Lateral footprint of CAS Vertical footprint of CAS Proportional to traffic levels	Excessive – Airspace required not the minimum necessary to deliver an efficient design.	Maintain/ Unknown – Similar CAS to today or extent of airspace required not yet known.	Minimum – Airspace required the minimum necessary to deliver an efficient design.

4.1.4 The criteria in Table 10 describe how each option's overall combination of Met/ Partial/ Not Mets lead to the option progressing to the next step or to rejection and discounting from further development.

Table 10 Progress/ Reject Criteria

DP Priority	Criteria for Rejection Status
A	1 DP 'Not Met' OR 1 'Partial'
B	At least 1 'Not Met' AND another 'Partial'
C	At least 2 'Not Met' AND another 'Partial'

4.2 Baseline (“Do Nothing”) – Design Principle Evaluation

Table 11 Baseline ("Do Nothing") – Design Principle Evaluation

Option Name: Baseline (“Do Nothing”)	REJECTED
Description: This is the current network scenario. No change to existing airspace, routes or traffic flows.	
Design principle 1: MDP Safety - A	MET
Maintained, no change from today’s operation.	
Design principle 2: DDP Operational (Capacity) - B	NOT MET
Maintained, no change from today’s operation.	
Design principle 3: BDP Technical (Future Airspace Enabler) - B	NOT MET
Incompatible and sub-optimal, not compatible with MTMA and LTMA modernisation projects due to complexity of deployments. Won’t provide an optimised interface.	
Design principle 4: MDP Policy - B	NOT MET
Misaligned with policy, no change from today’s operation so does not modernise UK airspace/ not aligned with the airspace modernisation strategy.	
Design principle 5: MDP Environment - C	PARTIAL
Maintained, no change from today’s operation.	
Design principle 6: DDP Technical (Performance based navigation) - C	PARTIAL
Maintained, no change from today’s operation.	
Design principle 7: DDP Technical (Ministry of Defence requirements) - C	MET
Compatible, no change from today’s operation.	
Design principle 8: DDP Technical (Accessibility for all airspace users) - C	PARTIAL
Maintained, no change from today’s operation.	
Design principle 9: DDP Technical (Controlled airspace) - C	PARTIAL
Maintained, no change from today’s operation.	

4.3 Option 1: 10 Parallel Routes – Design Principle Evaluation

Table 12 Option 1: 10 Parallel Routes – Design Principle Evaluation

Option Name: 10 Parallel Routes	PROGRESSED
Description: Introduces 10 parallel systemised routes and DCTs in the change area. Changes are to the en-route network between FL70 and FL660. It is anticipated that this change will require realignment of the EAMTA, TRA003 and some additional CAS.	
Design principle 1: MDP Safety - A	MET
Enhanced, systemised routes provide separation by design, leads to less tactical intervention, and greater predictability compared to today's operation.	
Design principle 2: DDP Operational (Capacity) - B	MET
Maximised, increases capacity by decreasing ATCO workload, increasing predictability, and utilising the full extent of the airspace.	
Design principle 3: BDP Technical (Future Airspace Enabler) - B	MET
Compatible and optimised, compatible with the MTMA and LTMA modernisation projects and provides optimised interfaces.	
Design principle 4: MDP Policy - B	MET
Aligned with policy, meets CAA policies and advances multiple AMS "Ends".	
Design principle 5: MDP Environment - C	PARTIAL
Partially meets objectives, as the hybrid design contains extensive systemisation, environmental impacts are likely to be similar to today.	
Design principle 6: DDP Technical (Performance based navigation) - C	MET
Efficiency benefits, design would utilise appropriate PBN to enable efficiency benefits.	
Design principle 7: DDP Technical (Ministry of Defence requirements) - C	PARTIAL
Partially compatible, extent of changes to EAMTA and TRA003 not yet defined. Feedback from MoD (DAATM) indicates further details are needed to understand impact and potential mitigations. Any airspace required would be the minimum necessary to deliver an efficient design.	
Design principle 8: DDP Technical (Accessibility for all airspace users) - C	PARTIAL
Minimise impacts, extent of CAS volume and classification changes not yet defined. Feedback from multiple stakeholders indicates further details are needed to understand impact and potential mitigations. Any airspace required would be the minimum necessary to deliver an efficient design.	
Design principle 9: DDP Technical (Controlled airspace) - C	PARTIAL
Minimise impacts, extent of CAS volume and classification changes not yet defined. Any airspace required would be the minimum necessary to deliver an efficient design.	

4.4 Option 2: 9 Parallel Routes – Design Principle Evaluation

Table 13 Option 2: 9 Parallel Routes – Design Principle Evaluation

Option Name: 9 Parallel Routes	REJECTED
Description: Introduces 9 parallel systemised routes and DCTs in the ACP change area. Changes are to the en-route network between FL70 and FL660. It is anticipated that this change will require realignment of the EAMTA.	
Design principle 1: MDP Safety - A	MET
Enhanced, systemised routes provide separation by design, leads to less tactical intervention, and greater predictability compared to today's operation.	
Design principle 2: DDP Operational (Capacity) - B	NOT MET
Maintained, limiting LTMA departure routes to 2 routes increases the complexity and therefore limits capacity.	
Design principle 3: BDP Technical (Future Airspace Enabler) - B	PARTIAL
Compatible but suboptimal, compatible with the MTMA and LTMA modernisation projects but doesn't provide a fully optimised interface.	
Design principle 4: MDP Policy - B	MET
Aligned with policy, meets CAA policies and advances multiple AMS "Ends".	
Design principle 5: MDP Environment - C	PARTIAL
Partially meets objectives, as the hybrid design contains extensive systemisation, environmental impacts are likely to be similar to today.	
Design principle 6: DDP Technical (Performance based navigation) - C	MET
Efficiency benefits, design would utilise appropriate PBN to enable efficiency benefits.	
Design principle 7: DDP Technical (Ministry of Defence requirements) - C	PARTIAL
Partially compatible, extent of changes to EAMTA not yet defined. Feedback from MoD (DAATM) indicates further details are needed to understand impact and potential mitigations. Any airspace required would be the minimum necessary to deliver an efficient design.	
Design principle 8: DDP Technical (Accessibility for all airspace users) - C	PARTIAL
Maintained, no change from today's operation.	
Design principle 9: DDP Technical (Controlled airspace) - C	PARTIAL
Maintained, no change from today's operation.	

4.5 Summary

4.5.1 Of the three options assessed in the DPE, two were rejected and one was progressed to the IOA. A summary is shown in Table 14 below.

Table 14 DPE Results

Design Option	Rejected/Progressed	Rejection Criteria Met
Baseline ("Do Nothing")	Rejected	At least 1 B priority DP 'Not Met' AND another B priority DP 'Partial'
Option 1 – 10 Parallel Routes	Progressed	None
Option 2 – 9 Parallel Routes	Rejected	At least 1 B priority DP 'Not Met' AND another B priority DP 'Partial'

5. Initial Options Appraisal (IOA)

5.1 Methodology

5.1.1 Each option will be assessed based on key analyses described in CAP1616F's Options Appraisal section (Reference 3). The IOA compares options against the baseline and assessment criteria can be seen in Table 15 below.

Table 15 IOA assessment criteria

Group	Impact	Level of Analysis	Evidence
Communities	Noise	N/A	Not assessed for this ACP as changes will be above the 7,000ft noise priority stated in the Air Navigation Guidance (ANG) (2017).
Communities	Local Air quality	N/A	Not assessed for this ACP as changes will be above the 1,000ft significant impact altitude referenced in the ANG (2017).
Wider society	Greenhouse gas emissions	Qualitative	A qualitative assessment of changes to greenhouse gas impacts compared with the 'Do Nothing' Baseline.
Wider society	Tranquillity	N/A	Not assessed for this ACP as changes will be above the 7,000ft tranquillity impact altitude stated in CAP1616i.
Wider society	Biodiversity	N/A	Not assessed for this ACP as changes will be above the 7,000ft biodiversity impact altitude stated in CAP1616i.
Wider society	Capacity/ resilience	Qualitative	A qualitative assessment of changes to airspace capacity and resilience compared with the 'Do Nothing' Baseline.
General Aviation (GA)	Access	Qualitative	A qualitative assessment of changes to GA access compared with the 'Do Nothing' Baseline.
GA/ commercial airlines	Economic impact from increased effective capacity	Qualitative	A qualitative assessment of changes to GA and commercial airline economic impacts from increased economic capacity compared with the 'Do Nothing' Baseline.
GA/ commercial airlines	Fuel burn	Qualitative	A qualitative assessment of changes to GA and commercial airline fuel burn impacts compared with the 'Do Nothing' Baseline.
Commercial airlines	Training costs	Qualitative	A qualitative assessment of changes to commercial airline training costs compared with the 'Do Nothing' Baseline.
Commercial airlines	Other costs	Qualitative	A qualitative assessment of changes to commercial airline other costs compared with the 'Do Nothing' Baseline.
Airport/ Air Navigation Service Provider (ANSP)	Infrastructure costs	Qualitative	A qualitative assessment of changes to Airport/ ANSP infrastructure costs compared with the 'Do Nothing' Baseline.
Airport/ ANSP	Operational costs	Qualitative	A qualitative assessment of changes to Airport/ ANSP operational costs compared with the 'Do Nothing' Baseline.
Airport/ ANSP	Deployment costs	Qualitative	A qualitative assessment of changes to Airport/ ANSP deployment costs compared with the 'Do Nothing' Baseline.
Airport/ ANSP	Other costs	Qualitative	A qualitative assessment of changes to Airport/ ANSP other costs compared with the 'Do Nothing' Baseline.

5.2 Baseline ("Do Nothing") – IOA

5.2.1 This is the existing airspace, routes and traffic flows but with increased traffic demand. The Baseline was discounted during the DPE but is included here for comparison. This IOA compares impacts against today's operation as the baseline can't be compared against itself.

Table 16 Baseline ("Do Nothing") - IOA

Group	Impact	Level of Analysis	Evidence
Wider society	Greenhouse gas emissions	Qualitative	No change to airspace therefore no change short term. Long term, as traffic increases, capacity becomes constrained, increasing the likelihood of delays, leading to increased greenhouse gas impacts.
Wider society	Capacity/ resilience	Qualitative	No change to airspace therefore no change short term. Long term, as traffic increases, capacity becomes constrained, and resilience is reduced.
GA	Access	Qualitative	No change to airspace therefore no change short term. Long term, as traffic increases, there could be small changes to access impacts, but these are likely to be similar to today.
GA/ commercial airlines	Economic impact from increased effective capacity	Qualitative	No change to airspace therefore no increased effective capacity. Long term, as traffic levels increase, the likelihood of delays will also increase, leading to a negative economic impact.
GA/ commercial airlines	Fuel burn	Qualitative	No change to airspace therefore no change short term. Long term, as traffic increases, capacity becomes constrained leading to delays and increased fuel burn impacts.
Commercial airlines	Training costs	Qualitative	No change to airspace therefore no change to impacts.
Commercial airlines	Other costs	Qualitative	No change to airspace therefore no change to impacts.
Airport/ ANSP	Infrastructure costs	Qualitative	No change to airspace therefore no change to impacts.
Airport/ ANSP	Operational costs	Qualitative	No change to airspace therefore no change to impacts.
Airport/ ANSP	Deployment costs	Qualitative	No change to airspace therefore no change to impacts.
Airport/ ANSP	Other costs	Qualitative	No change to airspace therefore no change to impacts.

5.3 Option 1: 10 Parallel Routes – IOA

5.3.1 Introduces 10 parallel systemised routes and DCTs in the ACP change area. Changes are to the en-route network between FL70 and FL660. It is anticipated that this change will require realignment of the EAMTA, TRA003 and some additional CAS.

Table 17 Option 1: 10 Parallel Routes - IOA

Group	Impact	Level of Analysis	Evidence
Wider society	Greenhouse gas emissions	Qualitative	The design would contain extensive systemisation which could lead to the extension of some flight profiles but the provision of DCTs and other optimisations could lead to the reduction of others. This balance means the option is expected to deliver similar greenhouse gas impacts to the baseline at implementation and 10 years post.
Wider society	Capacity/ resilience	Qualitative	The design would enable access to routes separated by design, leading to enhanced predictability and increased capacity. As traffic levels increase, this capacity improvement would reduce delay compared with the baseline. This increased capacity would also increase resilience to disruption compared to the baseline.
GA	Access	Qualitative	Although the extent and classification of CAS required for this option is not yet determined, it is anticipated that minimal amounts of additional CAS will be required. Depending on the exact dimensions/classification of CAS required, the design may increase negative GA access impacts compared to the baseline.
GA/ commercial airlines	Economic impact from increased effective capacity	Qualitative	The design would enable access to routes separated by design, leading to enhanced predictability and increased capacity. As traffic levels increase, this capacity improvement would reduce delay compared with the baseline. Enabling more flights to operate within the network is expected to provide an economic benefit.
GA/ commercial airlines	Fuel burn	Qualitative	The design would contain extensive systemisation which could lead to the extension of some flight profiles but the provision of DCTs and other optimisations could lead to the reduction of others. This balance means the option is expected to deliver similar fuel burn impacts to the baseline at implementation and 10 years post.
Commercial airlines	Training costs	Qualitative	Flight procedures change worldwide with each AIRAC cycle and airlines would update their procedures accordingly, training if required. This option is not anticipated to impose additional training cost impacts for airlines.
Commercial airlines	Other costs	Qualitative	No other airline costs are foreseen.
Airport/ ANSP	Infrastructure costs	Qualitative	This design option is not expected to change airport or ANSP infrastructure impacts.
Airport/ ANSP	Operational costs	Qualitative	This design option is not expected to change airport or ANSP operational cost impacts.
Airport/ ANSP	Deployment costs	Qualitative	At this stage it is disproportionate to attempt to quantify deployment costs. However, a change of this size would involve training a moderate number of controllers and operational staff via the use of various air traffic simulators (including sim prep, management, and staffing), with limited system engineering costs.

Airport/ ANSP	Other costs	Qualitative	No other Airport/ANSP costs are foreseen.
Summary	Compared to the baseline, Option 1 – 10 Parallel Routes offers better opportunities for improved capacity, resilience and economic impact compared to the baseline. Other areas of the IOA, greenhouse gas emissions, and fuel burn impacts are predicted to be similar to the baseline. Only GA access is assessed to potentially generate increased negative impacts compared to the baseline. As a result, Option 1 is progressed to Stage 3.		

5.4 IOA Evidence Gaps

5.4.1 Stage 3 will develop a detailed design for the preferred option which will enable more quantitative impact assessments including fuel burn, and CO_2e emissions analysis. It may be disproportionate to quantify some items depending on the circumstance and assumptions needed; in these cases, we will describe how a qualitative assessment provides adequate explanation.

This list of planned evidence for Stage 3 is as detailed as it can be at this time. The methodology for each will be described fully in Stage 3.

Noise, Local Air Quality, Tranquillity and Biodiversity

5.4.2 Not applicable to this change, as per Table 15.

Fuel burn and Greenhouse Gases

5.4.3 Fuel burn and CO_2e modelling analysis using the best available performance data from EUROCONTROL's Base of Aircraft Data (BADA) as the data source, will be processed via a fast-time simulation application.

5.4.4 Monetisation of the impacts of greenhouse gas emissions will be conducted using the Department for Transport's TAG workbook for greenhouse gases.

5.4.5 Fuel costs will be based on European market IATA jet fuel costs, converted from USD to GBP, both taken on a 'snapshot' date (which will be determined during the Stage 3 development work).

Capacity/Resilience

5.4.6 We anticipate improvements to capacity/resilience. Following the detailed procedure design in Stage 3, any change in impacts will be reviewed and the qualitative assessments for capacity/resilience will be updated. If quantitative data that can be equated to capacity can be modelled e.g. delay minutes, these will be shared, and monetised where practicable.

Access

5.4.7 We anticipate some negative impacts relating to access. Following the detailed procedure design in Stage 3, any change in impacts will be reviewed and qualitative assessments updated as required.

Economic impact

5.4.8 We anticipate some improvements to economic impact (effective capacity). Following the detailed procedure design in Stage 3, any change in impacts will be reviewed and qualitative assessments updated as required, quantitative assessments provided where practicable.

Other costs

5.4.9 Where possible benefits and impacts will be monetised at Stage 3, including any airlines 'other' costs and ANSP infrastructure and deployment costs. Where impacts cannot be monetised,

suitable justification or qualitative approaches as appropriate will be included within the assessments.

6. Safety Assessment

6.1.1 This section provides a brief, qualitative overview of the impact of each option on aviation safety. It should be noted that only Option 1 – 10 Parallel Routes is proposed to be progressed, nonetheless its progression was not on the basis that this option was the only one on the grounds of safety.

6.2 Baseline ("Do Nothing")

6.2.1 The current operation uses a published route structure and airline operators flight plan to follow available ATS routes as published in the UK AIP or flight plannable Directs (DCTs) as published in the Route Availability Document.

6.2.2 Flights into and out of the airspace volume are managed via published routes and waypoints between adjacent sectors. Transfer of traffic between these sectors is often conducted through the use of standing agreements and established coordination procedures as detailed in specific sections of the MATS pt. 2.

6.2.3 The published routes are historically predicated on ground-based navigation aids, based upon an outdated airspace design, and traffic needs to be tactically deconflicted by Air Traffic Controllers. This creates a high workload environment with a lack of overall predictability for both controllers and airlines.

6.2.4 In addition to following routes, some flights may be instructed to tactically route direct through the airspace, subject to other traffic.

6.3 Option 1: 10 Parallel Routes

6.3.1 The key element of the proposed revised airspace is a comprehensive network of systemised routes designed to improve traffic flow and increase capacity, as well as new arrival and departure route connectivity which may require a limited amount of additional controlled airspace.

6.3.2 Nothing is presently foreseen, that appears to have the potential to preclude maintenance of the existing level of safety performance undertaken within the current operation.

6.3.3 It is expected that the existing level of safety performance undertaken within the current operation would be maintained. This will be verified by assessing the change in accordance with the NATS Safety Management System and collecting supporting evidence throughout the project lifecycle.

6.4 Option 2: 9 Parallel Routes

6.4.1 The key element of the proposed revised airspace is a comprehensive network of systemised routes designed to improve traffic flow and increase capacity, as well as new arrival and departure route connectivity.

6.4.2 Nothing is presently foreseen, that appears to have the potential to preclude maintenance of the existing level of safety performance undertaken within the current operation.

6.4.3 It is expected that the existing level of safety performance undertaken within the current operation would be maintained. This will be verified by assessing the change in accordance with the NATS Safety Management System and collecting supporting evidence throughout the project lifecycle.

7. Summary and Next Steps

7.1 Summary

7.1.1 As part of the CAP1616 Stage 2 Develop and Assess NERL has conducted comprehensive two-way engagement with an extended list of stakeholders than those engaged during Stage 1. This has allowed us to test design options based on stakeholder input; the outcome of this engagement has influenced the selection of the design options presented herein.

7.1.2 Three design options were assessed in the DPE (including the Baseline "Do Nothing"), and one progressed to the IOA. From the IOA, we conclude that Option 1 – 10 Parallel Routes is suitable for further development and can be progressed to Stage 3.

7.1.3 As Option 1 - 10 Parallel Routes is the only design option to progress, it is the preferred option by default. However, as the option met 5 of the 9 design principles and partially met the other 4, NERL believes that it is also the preferred option due to the potential benefits it can deliver whilst minimising impacts where possible.

7.2 Next Steps

7.2.1 During Stage 3 we will work with stakeholders and ATC experts to further develop our remaining design option into a feasible design solution.

7.2.2 Appropriate impact qualitative assessments will be carried out on this design option, and these will be quantified where possible.

7.2.3 A cost-benefit analysis will be performed, and a preferred option will be stated. The option and full option appraisal will be presented for consultation.

8. Appendix A Final Design Principles

8.1.1 Table 18 summarises the final Design Principles (DPs) which resulted from the Stage 1 Define work. The table includes the DPs assigned priority level where "A" DPs must be met, "B" DPs should be met, and "C" priorities could be met.

8.1.2 The Stage 1 Design Principles document submitted to the CAA summarises the engagement completed; feedback received from aviation/community stakeholders; and the final DPs which resulted from this feedback.

Table 18 Final DPs agreed in Stage 1

Priority	Design Principle	Description
A	MDP Safety	The airspace change proposal must maintain a high standard of safety and should seek to enhance current levels of safety.
B	DDP Operational (Capacity)	The airspace change proposal should provide the greatest capacity benefits.
B	BDP Technical (Future Airspace Enabler)	The Midlands Airspace design will provide a compatible and optimised interface with the MTMA and LTMA modernisation projects.
B	MDP Policy	The airspace change proposal should not be inconsistent with relevant legislation, the CAA's airspace modernisation strategy or Secretary of State and CAA's policy and guidance.
C	MDP Environment	The airspace change proposal should deliver the Government's key environmental objectives with respect to air navigation as set out in the Government's Air Navigation Guidance 2017.
C	DDP Technical (Performance based navigation)	The proposed routes (instrument flight procedures/air traffic service routes) should be designed to enable efficiency benefits by using an appropriate standard of performance-based navigation.
C	DDP Technical (Ministry of Defence requirements)	The airspace change proposal should be compatible with the requirements of the Ministry of Defence.
C	DDP Technical (Accessibility for all airspace users)	The airspace change proposal should consider the impacts of operators and owners of all classes of aircraft, including general aviation and other civilian airspace users.
C	DDP Technical (Controlled Airspace)	The volume and classification of controlled airspace required for the provision of air traffic control services to IFR flights should be the minimum necessary to deliver an efficient airspace design, taking into account the needs of other airspace users.

9. Appendix B Summary of Stakeholders

9.1.1 Prior to the Stage 1 engagement activities, NERL identified relevant aviation industry stakeholders, and representatives for aviation groups where appropriate. This stakeholder list included those we are required to contact as part of an airspace change: namely the Ministry of Defence (MoD) and relevant members of the National Air Traffic Management Advisory Committee (NATMAC).

9.1.2 This stakeholder list was expanded in Stage 2 to include airports whose AIP section contains a STAR(s) which could be subject to change under this ACP.

Table 19 List of Stakeholders

Stakeholder Group	List of Organisations	Rationale
Airline Operators	British Airways, easyJet, Jet2, Ryanair, TUI Airways	Included at Stage 1- Top 5 airlines impacted by change
Airports	Birmingham, East Midlands, Farnborough, Liverpool John Lennon, London City, London Gatwick, London Luton, Heathrow, Stansted, Southampton, Southend	New at Stage 2 – Added as we now know which STARs are within scope for potential change.
Commercial Flightplan Service Provider (CFSP)	Air Support, Flight Keys, Jeppesen, Lido, Lufthansa Systems, NavBlue	Included at Stage 1- Flight planning service provider / data house impacted by change
GA	British Parachute Schools Ltd - Skydiving Langar	Included at Stage 1 - Self-identified during Stage 1
NATMAC	British Gliding Association (BGA)	Included at Stage 1- Representative organisation for gliding areas in scope
NATMAC	British Skydiving	Included at Stage 1- Representative organisation for parachute areas in scope
NATMAC	General Aviation Alliance (GAA)	Included at Stage 1- GA representative organisation
NATMAC	Ministry of Defence (MoD) via Defence Airspace and Air Traffic Management (DAATM)	Included at Stage 1 - Mandatory

10. Appendix C Feedback Form

10.1.1 The below questions were posed in a Microsoft Form which stakeholders were directed to via e-mail. Whether the question was mandatory or optional is indicated in brackets, as well as any branching. Whether the answer to the question was via a distinct option selection or a free text box is written beneath each question.

1. What is your full name? (Mandatory)
   Your full name will not be published publicly, but will be presented as engagement evidence to the CAA. If you are responding as an individual, we will publish your initials within our document set which will be visible to the public. If you are representing an organisation, only your organisation name will be published and visible to the public.

   Free Text Response

2. What is your email address? (Mandatory)
   Your email address will not be published publicly, but will be presented as engagement evidence to the CAA. We are gathering this information in case we need to ask for further information on one / more of your responses and can keep contact details for our stakeholder list up to date.

   Free Text Response

3. Are you responding on behalf of an organisation or as an individual? (Mandatory)

   "On behalf of an organisation"
   "As an Individual"

4. Which organisation are you representing? (Mandatory – only asked if "On behalf of an organisation" selected in response to question 3)
   Your organisation name will be associated with your answers, published and visible to the public.

   Free Text Response

5. Do you agree with the baseline presented? (Mandatory)

   "Yes"
   "No"
   "Maybe"

6. Please let us know what changes you think are required (Mandatory – only asked if "No" or "Maybe" selected in response to question 5)

   Free Text Response

7. How would you rate the anticipated impact of "Option 1 – 10 parallel routes" on you/your organisation? (Mandatory)

   "Clear Negative Impact"
   "Potential Negative Impact"
   "No Impact"
   "Potential Positive Impact"
   "Clear Positive Impact"

8. Please provide rationale for your answer above (Mandatory)

   Free Text Response

9. How would you rate the anticipated impact of "Option 2 – 9 parallel routes" on you/your organisation? (Mandatory)

"Clear Negative Impact"
"Potential Negative Impact"
"No Impact"
"Potential Positive Impact"
"Clear Positive Impact"

10. Please provide rationale for your answer above (Mandatory)

    Free Text Response

11. Do you agree with our assessment that Option 1 – 10 parallel routes is the preferred conceptual design option? (Mandatory)
    Note that the selection of a preferred design option will be reviewed again later in Stage 2.

    "Yes"
    "No"
    "Unsure"

12. Please provide rationale for your answer above (Mandatory)

    Free Text Response

13. Is there any other feedback or information you would like us to know? (Optional)
    Let us know any other feedback on our design concepts for the Modernising Midlands Airspace change. This space can also be used to request removal from our stakeholder list and future activities for this ACP if desired.

    Free Text Response

11. Appendix D Acronym List

Acronym	Definition
ACP	Airspace Change Proposal
AIP	Aeronautical Information Publication
AMS	Airspace Modernisation Strategy
ANSP	Air Navigation Service Provider
ATCO	Air Traffic Control Officer
ATM	Air Traffic Management
ATS	Air Traffic Service
BADA	Base of Aircraft Data
BGA	British Gliding Association
CAA	Civil Aviation Authority
CAS	Controlled Airspace
CFSP	Commercial Flightplan Service Provider
CTA	Control Area
DAATM	Defence Airspace and Air Traffic Management
DCT	Direct Route
DP	Design Principle
DPE	Design Principle Evaluation
EAMTA	East Anglia Military Training Area
FIR	Flight Information Region
FL	Flight Level
FRA	Free Route Airspace
GA	General Aviation
GAA	General Aviation Alliance
IFP	Instrument Flight Procedures
IFR	Instrument Flight Rules
IOA	Initial Options Appraisal
LTMA	London Terminal Control Area
MoD	Ministry of Defence
MTMA	Manchester Terminal Control Area
NATMAC	National Air Traffic Management Advisory Committee
NERL	NATS En Route Ltd
PBN	Performance Based Navigation

RNAV	Required navigation (Area Navigation Basic 5nm Precision 1nm)
SID	Standard Instrument Departure
SME	Subject Matter Expert
STAR	Standard Arrival Route
TRA	Temporary Reserved Area
UIR	Upper Information Region

End of Modernising Midlands Airspace Stage 2 Develop and Assess