

Modernising Midlands Airspace

Gateway Documentation:
Stage 3 Consult/Engage
Full Options Appraisal
ACP-2025-013

NATS

Table of Contents

1. Introduction	4
1.1 Background	4
1.2 Change Level and Scaling	4
2. Design Options Appraisal	4
2.1 Overview	4
2.2 Full Options Appraisal - Baseline ('do nothing')	6
2.3 Full Options Appraisal: Option 1 – 10 Parallel Routes	8
3. Cost Benefit Analysis	12
4. Safety Assessment	14
4.1 Overview	14
4.2 Baseline ('do nothing') – for comparison only	14
4.3 Option 1 – 10 Parallel Routes	14
5. Conclusions and Next Steps	15
5.1 Conclusions	15
5.9 Next Steps	15
6. Appendix A: Greenhouse Gases WebTAG Calculations	17
6.1 WebTAG Inputs	17
6.2 WebTAG GHG Workbook for Option 1 – 10 Parallel Routes	18
7. Appendix B Analysis methodology and assumptions	19
7.2 Assessment period	19
7.3 Fuel Burn and CO ₂ e emissions	19
7.4 Capacity/ Delay	21
8. Appendix C Glossary	24

Change History

Issue	Month/Year	Changes this issue (most recent first)
Version 1.1	August 2026	- Sections 5.1.1 to 5.1.12 of the conclusion have been revised to provide further information on the environmental efficiency objective and the assessed environmental impacts. - Table 2: GA/Military Access expanded to include Military impacts associated with changes to TRA003, EAMTA and AIAA LINCS.
Version 1	August 2026	N/A – First Issue

Roles

Action	Role	Date
Produced	Airspace Change Airspace Change Compliance & Delivery	August 2026
Reviewed Approved	Operations Implementation Manager Airspace Development	August 2026
Reviewed Approved	Head of Airspace Development Transformation Strategy and Development	August 2026

Referenced Documents

Ref No	Name and description	Links
1.	CAP1616 Edition 5.1	Link
2.	Airspace Change Portal page	Link
3.	CAP1616f v1.1	Link
4.	Air Navigation Guidance 2017	Link
5.	CAP1616i v1	Link
6.	Statement of Need	Link
7.	EUROCONTROL Standard Inputs for Economic Analyses, Ed. 10	Link
8.	European Airline Delay Cost Reference Values, University of Westminster, Ed. 4.1	Link

1. Introduction

1.1 Background

- 1.1.1 This document forms part of the document set required in accordance with the requirements of the CAA's CAP1616 Airspace Change Process [Ref 1].
- 1.1.2 This document aims to provide adequate evidence to satisfy Stage 3 Consult/Engage Full Options Appraisal (FOA), including a safety statement and environmental analysis of the baseline and option.
- 1.1.3 Building on the qualitative assessment undertaken during the Stage 2 Initial Options Appraisal (IOA), this document presents a more detailed quantitative assessment of the design option that progressed through that stage. Where practicable, all reasonable costs and benefits have been quantified. Any impacts that could not be quantified are described qualitatively, together with an explanation of the reasons why quantification was not possible.
- 1.1.4 Further information on the progression of this proposal through the airspace change process to date is available on the CAA's [Airspace Change Portal](#) page.

1.2 Change Level and Scaling

- 1.2.1 The changes proposed in this proposal will alter flight paths at/above 7,000ft (above mean sea level) only. Hence in accordance with the Levels as defined in CAP1616, this proposal is categorised as a 'Level 2' change.
- 1.2.2 In accordance with the requirements for a Level 2 airspace change, the environmental impact assessment has been undertaken using carbon dioxide equivalent (CO₂e) emissions as the primary metric. No perceptible change in noise exposure is anticipated for stakeholders on the ground and, consequently, a noise assessment has not been undertaken.

2. Design Options Appraisal

2.1 Overview

- 2.1.1 Each option progressed from Stage 2 will be assessed based on key analyses as defined in CAP1616f Options Appraisal, section 3.40 [Ref 3].
- 2.1.2 During Stage 2, two detailed design options were developed in addition to the baseline ('do nothing') option: Option 1 - 10 Parallel Routes, and; Option 2 - 9 Parallel Routes.
- 2.1.3 The Design Principle Evaluation (DPE) indicated that Option 2 would be likely to require significant controller intervention to maintain safe separation during medium and high traffic periods, reducing the operational benefits sought through the proposal. Option 2 was therefore discounted and not progressed to the FOA.
- 2.1.4 The baseline ('do nothing') option was additionally discounted in Stage 2, as it did not provide improvements in operational capacity, and resulted in a sub-optimal interface with the London TMA (LTMA) and Manchester TMA (MTMA). It is included here for comparison only.
- 2.1.5 As a result, Option 1 - 10 Parallel Routes, is the only viable design option and is assessed against the baseline ('do nothing') scenario:

Option 1 – 10 Parallel Routes. This proposal has 10 parallel Air traffic Service (ATS) routes, which are route-separated (or 'systemised') by design. There are 5 southbound routes, and 5 northbound routes. All other traffic overflying the airspace volume (FL200+) is permitted to flight plan more efficient trajectories by means of flight plannable direct routes (DCTs) as per current operations. This creates a 'Hybrid Systemised' environment whereby the systemised route structure supports the complexity of climbing/ descending traffic

between the TMAs, and the flight plannable DCTs provide more environmentally efficient direct routings for the less complex overflight traffic. These changes to the enroute network are between FL70 to FL460 and will require additional Controlled Airspace (CAS), including revision of 3 Military airspace volumes: the East Anglia Military Training Area (EAMTA), Temporary Reserved Area (TRA)003, and the Area of Intense Aerial Activity (AIAA) Lincolnshire (LINCS).

- 2.1.6 The proposed Midlands Airspace change is currently expected to be implemented no earlier than November 2028, allowing deconfliction with other operational deployments planned for 2028. Accordingly, 2029 has been adopted as the first year of implementation, rather than modelling a partial year covering only the final two months of 2028. The assessment therefore considers Year 1 (2029) and the subsequent 10-year appraisal period to 2038 for both the baseline and proposed change scenarios.
- 2.1.7 Full details of the modelling approach, underlying assumptions and supporting data sources are provided in Appendix B Analysis methodology and assumptions

2.2 Full Options Appraisal - Baseline ('do nothing')

2.2.1 Table 1 presents the impact assessment for the baseline scenario. This option was discounted at Stage 2 and is included in this assessment for comparative purposes only.

Table 1: FOA for Baseline ('do nothing')

Group	Impact	Level of Analysis	Evidence ¹												
Communities	Noise	N/A	Not assessed for the baseline as changes to flight paths will be at/above the 7,000ft noise priority defined in the Air Navigation Guidance (ANG) (2017), para. 3.3.d, [Ref 4].												
Communities	Local air quality	N/A	Not assessed for the baseline as changes to flight paths will be above the 1,000ft significant impact altitude defined in the ANG (2017), para. 3.28, [Ref 4].												
Wider society	Greenhouse gas (GHG) emissions	Quantified	Carbon Dioxide Equivalent (CO₂e) emissions analysis has been performed using computer simulations which modelled the current operation of Midlands Airspace. Extrapolating current-day traffic levels using traffic forecast figures presents the baseline ('do nothing') scenario as follows: <table><tr><th>Year</th><th>Traffic (forecast)</th><th>Total Annual CO₂e (kt)</th></tr><tr><td>2025 (current day)</td><td>473,141</td><td>3,610.84</td></tr><tr><td>2029 (Year 1)</td><td>482,023</td><td>3,717.22</td></tr><tr><td>2038 (Year 10)</td><td>492,951</td><td>3,871.74</td></tr></table> Under the baseline scenario, forecast traffic growth results in a corresponding increase in greenhouse gas emissions. Annual CO₂e emissions are expected to rise from approximately 3,717 kt in 2029 to 3,872 kt by 2038, broadly in line with the increase in traffic levels over the appraisal period.	Year	Traffic (forecast)	Total Annual CO ₂ e (kt)	2025 (current day)	473,141	3,610.84	2029 (Year 1)	482,023	3,717.22	2038 (Year 10)	492,951	3,871.74
Year	Traffic (forecast)	Total Annual CO ₂ e (kt)													
2025 (current day)	473,141	3,610.84													
2029 (Year 1)	482,023	3,717.22													
2038 (Year 10)	492,951	3,871.74													
Wider society	Tranquillity	N/A	Not assessed for the baseline as changes to flight paths will be at/above the 7,000ft tranquillity impact altitude defined in CAP1616i, Chapter 8, [Ref 5].												
Wider society	Biodiversity	N/A	Not assessed for the baseline as changes to flight paths will be at/above the 7,000ft biodiversity impact altitude defined in CAP1616i, Chapter 9, [Ref 5].												
Wider society	Capacity/resilience	Quantified and monetised	No change to airspace therefore no change in the short term. In the medium to long term, as traffic increases, capacity would become constrained, and resilience would be reduced. See "Economic impact from increased effective capacity" for delay figures.												
General Aviation (GA)	Access	Qualitative	No change to airspace therefore no change in the short term. In the medium to long term, as traffic increases, there is the potential for reduced GA access to extant Class C airspace within the scope of this change area. Whilst access impacts are not directly measurable, below FL195 there are currently 5 Class C Daventry CTAs (Control Areas with a classification that permits GA access) which could be subject to reduced opportunities for access as traffic levels increase.												
GA/commercial airlines	Economic impact from increased	Quantified and monetised	No change to airspace therefore no change in the short term. In the medium to long term, as traffic increases, the likelihood of delays will also increase, leading to a negative economic impact.												

¹ For the purposes of this appraisal, 'short term' impacts are considered to be less than 5 years and 'medium to long term' impacts are considered to be between 5 to 10 years.

	effective capacity		<table> <tr> <th>Year</th><th>Traffic (forecast)</th><th>Total Annual Delay (minutes)</th><th>Total Annual Cost of Delay (£)</th></tr> <tr> <td>2029 (Year 1)</td><td>482,023</td><td>155,521</td><td>5,216,364</td></tr> <tr> <td>2038 (Year 10)</td><td>492,951</td><td>289,013</td><td>9,297,917</td></tr> </table> The baseline estimates approximately 155,521 minutes of delay for 2029, increasing to 289,013 minutes by 2038 in line with forecast traffic growth over the appraisal period. Over the 10-year appraisal period, the present value of delay costs is estimated to be £74,969,407.	Year	Traffic (forecast)	Total Annual Delay (minutes)	Total Annual Cost of Delay (£)	2029 (Year 1)	482,023	155,521	5,216,364	2038 (Year 10)	492,951	289,013	9,297,917				
Year	Traffic (forecast)	Total Annual Delay (minutes)	Total Annual Cost of Delay (£)																
2029 (Year 1)	482,023	155,521	5,216,364																
2038 (Year 10)	492,951	289,013	9,297,917																
GA/ commercial airlines	Fuel burn	Quantified and monetised	Fuel burn analysis has been performed using computer simulations which modelled the current operation of Midlands Airspace. Extrapolating current-day traffic levels using traffic forecast figures presents the baseline ('do nothing') option as follows: <table> <tr> <th>Year</th><th>Traffic (forecast)</th><th>Total Annual Fuel Burn (kt)</th><th>Total Annual Fuel Cost (£m)</th></tr> <tr> <td>2025 (current day)</td><td>473,141</td><td>1,136.07</td><td>656.3</td></tr> <tr> <td>2029 (Year 1)</td><td>482,023</td><td>1,169.54</td><td>588.78</td></tr> <tr> <td>2038 (Year 10)</td><td>492,951</td><td>1,218.15</td><td>449.96</td></tr> </table> Under the baseline scenario, forecast traffic growth results in an increase in annual fuel burn from approximately 1,170 kt in 2029 to 1,218 kt by 2038. Although fuel consumption increases over the appraisal period, total annual fuel costs in present value terms are forecast to decrease from approximately £589 million to £450 million, reflecting the fuel-cost assumptions applied within the economic appraisal rather than a reduction in fuel usage. Over the 10-year appraisal period, the present value of fuel costs is estimated to be £5.17 billion.	Year	Traffic (forecast)	Total Annual Fuel Burn (kt)	Total Annual Fuel Cost (£m)	2025 (current day)	473,141	1,136.07	656.3	2029 (Year 1)	482,023	1,169.54	588.78	2038 (Year 10)	492,951	1,218.15	449.96
Year	Traffic (forecast)	Total Annual Fuel Burn (kt)	Total Annual Fuel Cost (£m)																
2025 (current day)	473,141	1,136.07	656.3																
2029 (Year 1)	482,023	1,169.54	588.78																
2038 (Year 10)	492,951	1,218.15	449.96																
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/ Air Navigation Service Provider (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.																

2.3 Full Options Appraisal: Option 1 – 10 Parallel Routes

2.3.1 Option 1 would introduce 10 parallel systemised routes and flight plannable DCTs within the change area. The changes affect the enroute network between FL70 and FL460 and require the realignment of the EAMTA, TRA003, and AIAA LINCS, together with the establishment of some additional CAS.

Table 2: FOA for Option 1 – 10 Parallel Routes

Group	Impact	Level of Analysis	Evidence																						
Communities	Noise	N/A	Not assessed for this proposal as changes to flight paths will be at/above the 7,000ft noise priority defined in the ANG (2017), para. 3.3.d [Ref 4].																						
Communities	Local air quality	N/A	Not assessed for this proposal as changes to flight paths will be above the 1,000ft significant impact altitude defined in the ANG (2017), para. 3.28, [Ref 4].																						
Wider society	GHG emissions	Quantified and monetised	This option is expected to result in a small increase in average GHG emissions per flight. While many routes benefit from reduced track mileage and improved operational efficiency, these benefits are outweighed overall by disbenefits on a small number of high-traffic departure flows using the systemised route structure, resulting in a net increase in CO₂e emissions. The overall CO₂e disbenefit is primarily driven by a limited number of long-haul departure routes requiring additional track miles during the climb phase of flight. However, impacts vary across the network, with some routes benefiting from shorter track mileage and improved efficiency. As a result, the aggregated assessment masks a more complex distribution of route-specific² benefits and disbenefits. Despite the overall increase in emissions, the impact at an individual flight level remains small, equating to an average increase of 3.4 kg CO₂e per flight across approximately 500,000 annual movements. Relative to the average emissions of approximately 7,850 kg per flight for the assessed traffic sample, this represents an increase of around 0.04% and is therefore considered a <u>low-impact effect</u>. The WebTAG assessment estimates a 10-year present value environmental impact of approximately -£4.78 million. <table><tr><th rowspan="2">Year</th><th rowspan="2">Traffic (forecast)</th><th colspan="2">Change in Track Miles (NM)</th><th colspan="2">Change in CO₂e</th></tr><tr><th>Total Annual</th><th>Average per flight</th><th>Total Annual (t)</th><th>Average per flight (kg)</th></tr><tr><td>2029 (Year 1)</td><td>482,023</td><td>+267,190.8</td><td>+0.6</td><td>+1,642.9</td><td>+3.4</td></tr><tr><td>2038 (Year 10)</td><td>492,951</td><td>+281,075.1</td><td>+0.6</td><td>+1,692.2</td><td>+3.4</td></tr></table>	Year	Traffic (forecast)	Change in Track Miles (NM)		Change in CO ₂ e		Total Annual	Average per flight	Total Annual (t)	Average per flight (kg)	2029 (Year 1)	482,023	+267,190.8	+0.6	+1,642.9	+3.4	2038 (Year 10)	492,951	+281,075.1	+0.6	+1,692.2	+3.4
Year	Traffic (forecast)	Change in Track Miles (NM)				Change in CO ₂ e																			
		Total Annual	Average per flight	Total Annual (t)	Average per flight (kg)																				
2029 (Year 1)	482,023	+267,190.8	+0.6	+1,642.9	+3.4																				
2038 (Year 10)	492,951	+281,075.1	+0.6	+1,692.2	+3.4																				
Wider society	Tranquillity	N/A	Not assessed for this proposal as changes to flight paths will be at/above the 7,000ft tranquillity impact altitude defined in CAP1616i, Chapter 8, [Ref 5].																						
Wider society	Biodiversity	N/A	Not assessed for this proposal as changes to flight paths will be at/above the 7,000ft biodiversity impact altitude defined in CAP1616i, Chapter 9, [Ref 5].																						

² A detailed route-specific assessment has not been undertaken, as the range of aircraft types, origin-destination pairs and flight level permutations would make such analysis disproportionate for the purposes of this appraisal.

Wider society	Capacity/ resilience	Quantified and monetised	Compared with the baseline ('do nothing') scenario, this option enhances network resilience through a route structure that is separated by design, reducing operational complexity, improving traffic predictability, and increasing flexibility for controllers to manage traffic safely and efficiently during periods of high demand or disruption. See "Economic impact from increased effective capacity" for delay figures.																			
GA/ Military	Access	Quantified	This option requires approximately 315.8nm² of additional CAS to support the new route network. The proposed additional CAS is above FL100 and in airspace which is not regularly used by Visual Flight Rules (VFR) aircraft or gliders. The new airspace is designated as Class C; this classification permits access to GA traffic, and is the lowest level of airspace classification considered safe due to the volume and complexity of traffic. As such, it is considered that access for GA will not be significantly changed from the baseline ('do nothing') scenario. NATS has engaged at all stages with the MoD and the proposed change is not expected to have an unacceptable impact on MoD operations. This option requires adjustment to the lateral boundaries for TRA003 (~224.6nm² reduction in area), and the EAMTA (~218nm² increase in area), to support the new route network, and a revised vertical boundary for AIAA LINC5 to reduce the complexity/workload for controllers operating the new CAS. Following discussions with the military, increased airspace is proposed for the EAMTA on the northern boundary, to mitigate disruption to military operations on the east side of the proposed Midlands Airspace.																			
GA/ commercial airlines	Economic impact from increased effective capacity	Quantified and monetised	This option provides ATS routes separated by design, leading to enhanced predictability and increased capacity. As traffic levels increase, this capacity improvement would reduce delay³ compared with the baseline ('do nothing') scenario, resulting in operational efficiency benefits for airspace users and a corresponding reduction in delay-related costs. <table><tr><th rowspan="2">Year</th><th colspan="2">Delay (minutes)</th><th colspan="2">Delay cost benefit (£)</th></tr><tr><th>Total Annual Delay</th><th>Difference to baseline</th><th>Total Annual cost</th><th>Difference to baseline</th></tr><tr><td>2029 (Year 1)</td><td>151,716</td><td>-3,805</td><td>5,330,293</td><td>-113,929</td></tr><tr><td>2038 (Year 10)</td><td>266,436</td><td>-22,577</td><td>8,371,802</td><td>+926,115</td></tr></table> For this option, total delay is estimated at 151,716 minutes in 2029, increasing to 266,436 minutes by 2038 in line with forecast traffic growth over the appraisal period. While this option alleviates part of the capacity bottleneck within certain Midlands sectors, delays in adjacent regions increase in 2029. Consequently, the net delay impact in the first year of implementation is limited to around 4,000 minutes, resulting in a delay cost impact of approximately -£113,929 in present value terms. This occurs because, in the baseline scenario, delays within certain Midlands sectors help regulate demand in neighbouring airspace. As these regulations are reduced or removed, traffic demand is redistributed, requiring additional delay in adjacent sectors to ensure their capacity limits are not exceeded. By 2038, changes in traffic growth and peak demand patterns reduce this secondary effect, leading to lower delays in neighbouring regions.	Year	Delay (minutes)		Delay cost benefit (£)		Total Annual Delay	Difference to baseline	Total Annual cost	Difference to baseline	2029 (Year 1)	151,716	-3,805	5,330,293	-113,929	2038 (Year 10)	266,436	-22,577	8,371,802	+926,115
Year	Delay (minutes)		Delay cost benefit (£)																			
	Total Annual Delay	Difference to baseline	Total Annual cost	Difference to baseline																		
2029 (Year 1)	151,716	-3,805	5,330,293	-113,929																		
2038 (Year 10)	266,436	-22,577	8,371,802	+926,115																		

³ NATS-attributable Air Traffic Flow Management (ATFM) delay, including delays caused by demand exceeding available sector capacity, or by route and airspace design constraints that reduce network throughput and operational efficiency.

			Although delay costs increase slightly in 2029, as lower-cost delays in Midlands Airspace are replaced by more costly delays in adjacent sectors, this effect is temporary. Over the 10-year assessment period, higher-cost delays become more prevalent as traffic grows, and the change scenario increasingly reduces these delays, generating annual savings of approximately £926,115 in present value terms by 2038. Overall, the assessment indicates that the proposed airspace change would reduce delay costs relative to the baseline ("do nothing") scenario. The 10-year present value of delay costs is estimated at £70.4 million, representing a benefit of approximately -£4.57 million compared with the baseline.																						
GA/ commercial airlines	Fuel burn	Quantified and monetised	This option is expected to result in a small increase in average fuel burn per flight. While many routes benefit from reduced track mileage and improved operational efficiency, these benefits are outweighed overall by disbenefits on a small number of high-traffic departure flows using the systemised route structure, resulting in a net increase in fuel burn. The overall fuel burn disbenefit is primarily driven by a limited number of long-haul departure routes requiring additional track miles during the climb phase of flight. However, impacts vary across the network, with some routes benefiting from shorter track mileage and improved efficiency. As a result, the aggregated assessment masks a more complex distribution of route-specific⁴ benefits and disbenefits. Despite the overall increase in fuel burn, the impact at an individual flight level remains small, equating to an average increase of 1.1 kg of fuel per flight across approximately 500,000 annual movements. Relative to the average fuel burn of approximately 2,470 kg per flight for the assessed traffic sample, this represents an increase of around 0.04% and is therefore considered a <u>low-impact effect</u>. The assessment estimates a 10-year present value fuel cost impact of approximately -£2.27 million. <table><tr><th rowspan="2">Year</th><th rowspan="2">Traffic (forecast)</th><th colspan="2">Change in Fuel Burn</th><th colspan="2">Change in Fuel Burn Cost (£)</th></tr><tr><th>Total Annual (t)</th><th>Average per flight (kg)</th><th>Total Annual</th><th>Average per flight</th></tr><tr><td>2029 (Year 1)</td><td>482,023</td><td>+516.9</td><td>+1.1</td><td>+260,372</td><td>+£0.54</td></tr><tr><td>2038 (Year 10)</td><td>492,951</td><td>+532.4</td><td>+1.1</td><td>+196,658</td><td>+£0.40</td></tr></table>	Year	Traffic (forecast)	Change in Fuel Burn		Change in Fuel Burn Cost (£)		Total Annual (t)	Average per flight (kg)	Total Annual	Average per flight	2029 (Year 1)	482,023	+516.9	+1.1	+260,372	+£0.54	2038 (Year 10)	492,951	+532.4	+1.1	+196,658	+£0.40
Year	Traffic (forecast)	Change in Fuel Burn				Change in Fuel Burn Cost (£)																			
		Total Annual (t)	Average per flight (kg)	Total Annual	Average per flight																				
2029 (Year 1)	482,023	+516.9	+1.1	+260,372	+£0.54																				
2038 (Year 10)	492,951	+532.4	+1.1	+196,658	+£0.40																				
Commercial airlines	Training costs	Qualitative	Flight procedures change worldwide with each Aeronautical Information Regulation and Control (AIRAC) cycle and airlines would update their procedures accordingly, training if required. This proposal 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	Minor airport infrastructure costs are anticipated for this option. Airport-related impacts are limited to updates to aeronautical charts, flight planning information, and associated systems to reflect revised STAR designations for Birmingham, East Midlands, Liverpool John Lennon, London City, London Gatwick, London Heathrow, London Luton, London Stansted, Manchester and Southend Airports, together with the introduction of a new STAR for London City Airport. In addition, changes to adjoining controlled airspace may require updates to radar displays and operational documentation for Birmingham and East Midlands approach units.																						

⁴ A detailed route-specific assessment has not been undertaken, as the range of aircraft types, origin-destination pairs and flight level permutations would make such analysis disproportionate for the purposes of this appraisal.

			These impacts have not been quantified, as costs incurred by external organisations cannot be reliably estimated. However, they are expected to be minor and are unlikely to be significant.
Airport/ ANSP	Operational costs	Qualitative	This option would not lead to changes in operational costs.
Airport/ ANSP	Deployment costs	Quantified	The proposed airspace change primarily affects the London Terminal Control (LTC) Midlands sectors, the London Area Control (LAC) Daventry sectors, and the Prestwick Control (PC) South East sectors. Approximately 140 air traffic controllers would require conversion training using the NATS simulation facility, supported by simulation, training and safety personnel. Controller training may also create temporary rostering constraints that will need to be managed to maintain service continuity. In addition, changes to adjoining controlled airspace may require controller training for Birmingham and East Midlands approach units.
Airport/ ANSP	Other costs	Qualitative	No other costs are foreseen
Summary	Overall, Option 1 directly addresses the Statement of Need (SoN) [Ref 6] by increasing airspace capacity and delivering a systemised route structure that supports the safe and efficient accommodation of forecast traffic growth within the Midlands area. By introducing ATS routes that are separated by design, the option improves traffic predictability, enhances network resilience, and provides greater flexibility for controllers to manage traffic safely and efficiently during periods of high demand or disruption. Although it results in a marginal increase in fuel burn and greenhouse gas emissions per flight, these environmental disbenefits are increasingly outweighed by the long-term operational and economic benefits arising from reduced delays and improved network performance. The assessment indicates a strengthening business case over time, driven by reducing costs relative to the baseline scenario, with net quantified benefits increasing throughout the appraisal period and the annual net quantified impact in present value terms improving to approximately £225,454 in 2038.		

3. Cost Benefit Analysis

- 3.1.1 The monetised impacts of Option 1 - 10 Parallel Routes (the NATS preferred option), assessed against the baseline ('do nothing') scenario, are summarised in Table 3.
- 3.1.2 The cost-benefit assessment shows that Option 1 generates increasing operational and economic benefits over time.
- 3.1.3 In the early years of the appraisal period, the option produces a net disbenefit, driven primarily by increased greenhouse gas emissions and fuel costs. Although delay-related benefits increase steadily, they do not outweigh these disbenefits until 2036, when the annual present value of Net Quantified Impact becomes positive.
- 3.1.4 By 2038, the annual Net Quantified Impact in present value terms is estimated at approximately £225,454, reflecting growing delay-cost savings as the capacity and resilience benefits of the airspace change are realised. Delay-cost benefits improve from a present value impact of approximately -£113,929 in 2029 to a present value benefit of £926,115 in 2038, becoming the dominant contributor to the business case.
- 3.1.5 The present value impacts over the full 10-year appraisal period^{5,6} are summarised as follows:
- Delay Cost Impact: +£4.57 million
 - Airspace Users CO₂e Impact: +£0.26 million
 - Wider Society CO₂e Impact: -£5.03 million
 - Fuel Cost Impact: -£2.27 million
 - Overall NPV of Quantified Impact: -£2.48 million
- 3.1.6 The monetised results are based on the CO₂e and fuel analysis methodology described in Appendix B Analysis methodology and assumptions. While actual post-implementation outcomes may differ from these forecasts, the methodology provides the most robust estimate available prior to implementation.

⁵ A discount rate of 3.5% per annum, applied from 2029 in accordance with HM Treasury Green Book guidance (Annex A6), has been used.

⁶ WebTAG outputs are based on a 2023 CO₂e values price base year and are presented in market prices.

Table 3: Cost benefit for Option 1: 10 Parallel Route (NATS preferred option)

Year	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	Totals
Discount Factor (Pre-applied)	1.23	1.27	1.32	1.36	1.41	1.46	1.51	1.56	1.62	1.68	n/a
Annual Present Values (PVs)											10-year NPV
Net Airspace Users, CO ₂ e Impact ⁷	-£106,305.29	-£74,180.17	-£40,923.29	-£9,534.66	£19,354.38	£46,877.11	£71,806.39	£95,401.64	£117,074.42	£136,482.88	£256,053.41
Net Wider Society CO ₂ e Impact ⁸	-£353,664.85	-£390,087.56	-£424,989.65	-£458,985.02	-£491,805.60	-£523,478.53	-£554,299.00	-£583,750.92	-£612,650.51	-£640,486.39	-£5,034,198.03
Net Airspace Users Fuel Cost Impact - airborne fuel ⁹	-£260,372.32	-£252,442.99	-£244,846.18	-£237,020.42	-£229,882.65	-£222,956.58	-£215,826.52	-£209,319.42	-£203,005.60	-£196,657.81	-£2,272,330.49
Net Airspace Users Delay Cost Impact - excluding airborne fuel ¹⁰	-£113,928.66	£37,656.55	£179,119.91	£310,972.63	£433,702.95	£547,777.05	£653,640.04	£751,716.79	£842,412.87	£926,115.29	£4,569,185.42
Total Net Quantified Impact (annual PVs shown by year; NPV shown in final column. Rounded to the nearest £1000)	-£834,271	-£679,054	-£531,639	-£394,567	-£268,631	-£151,781	-£44,679	£54,048	£143,831	£225,454	-£2,481,290

⁷ The Airspace Users CO₂e Impact is the Traded WebTAG Data. Traded emissions are associated with flights covered by emissions trading schemes, including flights between the UK and EEA/EU states. A positive value reflects a net benefit (i.e. CO₂e reduction).

⁸ The Wider Society CO₂e Impact is the Non-Traded WebTAG Data. Non-traded emissions are generally associated with transatlantic flights, which are appraised using non-traded carbon values. A positive value reflects a net benefit (i.e. CO₂e reduction).

⁹ This ACP does not affect aircraft holding, as the proposed changes are limited to routes upstream of the hold and do not alter holding patterns or procedures. Consequently, the fuel cost assessment considers airborne fuel consumption only and excludes any effects associated with holding. A positive value reflects a net benefit (i.e. fuel cost reduction).

¹⁰ The delay cost assessment incorporates fuel costs associated with at-gate and taxi operations, but excludes airborne fuel consumption, which is assessed separately under Fuel Cost Impact – airborne fuel.

4. Safety Assessment

4.1 Overview

- 4.1.1 This section provides a brief, qualitative overview of the impact of each option on aviation safety, in line with CAP1616f paragraph 4.15, [Ref 3].
- 4.1.2 Although only Option 1 - 10 Parallel Routes is proposed for progression, this is not because it was the only option assessed as safe. The option has been selected based on its overall performance against the assessment criteria.

4.2 Baseline ('do nothing') – for comparison only

- 4.2.1 The current operation uses a published route structure and airline operators flight plan to follow available ATS routes as published in the UK Aeronautical Information Publication (AIP) or flight plannable DCTs as published in the Route Availability Document.
- 4.2.2 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 Manual of Air Traffic Services (MATS) Part 2.
- 4.2.3 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.
- 4.2.4 In addition to following routes, some flights may be instructed to tactically route direct through the airspace, subject to other traffic.

4.3 Option 1 – 10 Parallel Routes

- 4.3.1 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.
- 4.3.2 This change is being assured in accordance with the NATS Safety Management System. An Assurance Plan has been developed, supported by development simulations and Preliminary Hazard Identification and Risk Assessment workshops. Early safety assessments identified no significant safety concerns, and development simulations involving operational controllers found the revised airspace design to be safe, usable and operationally beneficial, with reduced workload and improved predictability. While risk assessment activities are ongoing, no issues have been identified to date that are expected to result in unacceptable risk. The remaining hazard identification and risk assessment work will be completed during the pre- and post-validation stages.

5. Conclusions and Next Steps

5.1 Conclusions

- 5.1.1 The key objectives of this proposal are to enhance route capacity, reduce operational complexity and, where practicable, deliver environmental efficiencies, in accordance with the SoN, [Ref 6].
- 5.1.2 In addition to the baseline scenario, two design options were initially developed in Stage 2. Following the DPE and IOA, only one option remained viable and was therefore progressed to the FOA: Option 1 – 10 Parallel Routes.
- 5.1.3 Option 1 introduces a network of 10 parallel ATS routes, maximising the number of routes that can be accommodated within the constraints of the available airspace whilst providing the most efficient and direct route structure through the change area.
- 5.1.4 In comparison with the baseline scenario, Option 1 provides the greatest alignment with the SoN by delivering a systemised route network that improves operational performance, enhances network resilience and supports the safe and efficient management of forecast traffic demand.
- 5.1.5 No significant impacts on local communities were identified, with all changes occurring above the relevant assessment thresholds for noise, air quality, tranquillity and biodiversity.
- 5.1.6 The option results in a marginal increase in route length, fuel burn and greenhouse gas emissions, primarily driven by a limited number of long-haul departure routes. This is an unavoidable consequence of the operational design, which requires additional track mileage on some routes to provide connectivity to the proposed systemised route structure; however, the proportional impact remains small given the overall route length. Impacts vary across the network, with other routes benefiting from shorter track mileage and improved efficiency. Average track mileage increases by approximately 0.6 NM per flight, leading to an increase of around 1,600 to 1,700 tonnes of CO₂e annually and an estimated environmental impact of approximately -£4.8 million in present value terms over the 10-year appraisal period.
- 5.1.7 Despite the overall increase in fuel burn, the impact at an individual flight level remains small, equating to an average increase of 1.1 kg of fuel and 3.4 kg CO₂e per flight across approximately 500,000 annual movements. Relative to the average fuel burn and CO₂e emissions of approximately 2,470 kg and 7,850 kg per flight, respectively, for the assessed traffic sample, this represents an increase of around 0.04% and is therefore considered a low-impact effect.
- 5.1.8 Operationally, the option improves route segregation and predictability, increasing capacity and resilience. Although some delay benefits are offset in 2029 by the redistribution of demand into neighbouring sectors, this effect diminishes over time. By 2038, annual delay-cost savings in present value terms are estimated at approximately £926,115, with a 10-year benefit of around £4.57 million compared with the baseline.
- 5.1.9 The present value fuel cost impact is approximately -£260,000 per annum in 2029. However, this disbenefit is increasingly outweighed over time by the operational benefits associated with reduced delays and improved network performance.
- 5.1.10 Implementation impacts are expected to be limited. Airlines are not anticipated to incur significant costs, while airports would require only minor updates to procedures, systems and documentation.
- 5.1.11 Overall, the proposal delivers a strengthening business case over time, driven by reducing costs relative to the baseline scenario, with net quantified benefits increasing throughout the appraisal period and the annual net quantified impact in present value terms improving to approximately £225,454 in 2038.
- 5.1.12 As the only option remaining following the options development process, Option 1 will be taken forward to consultation as the preferred option. Although the proposal results in a

marginal increase in overall route length, fuel burn and greenhouse gas emissions compared with the baseline, the impact at an individual flight level is very small and is limited to a number of long-haul departure routes. This is partially offset by shorter track mileage and improved operational efficiency on other routes where practicable. NATS therefore considers that Option 1 aligns with the SoN and represents the most appropriate balance between capacity, operational efficiency and environmental considerations. As such, it is proposed for consultation, providing stakeholders with the opportunity to review the proposal and provide feedback.

5.2 Next Steps

5.2.1 Subject to CAA approval at the Stage 3 Gateway assessment, this proposal will be consulted on in line with our Consultation Strategy.

5.2.2 NATS thanks all stakeholders who have participated in engagement thus far and look forward to their feedback during consultation and continued involvement with the development of this proposal.

6. Appendix A: Greenhouse Gases WebTAG Calculations

6.1 WebTAG Inputs

Traffic Forecast – NATS NOV2025 Long Term Forecast - Extended

Year	Movements		
	Traded	Non-Traded	Total
2029	207,733	274,290	482,023
2030	207,720	275,518	483,238
2031	207,706	276,746	484,452
2032	207,692	277,974	485,666
2033	207,678	279,202	486,880
2034	207,665	280,430	488,095
2035	207,651	281,658	489,309
2036	207,637	282,886	490,523
2037	207,623	284,114	491,737
2038	207,609	285,342	492,951

Computer Modelling Results: Baseline CO₂e

Year	Emissions (tCO ₂ e)		
	Traded	Non-Traded	Total
2029	1,306,125	2,411,091	3,717,216
2030	1,273,965	2,460,420	3,734,385
2031	1,241,805	2,509,749	3,751,554
2032	1,209,122	2,559,602	3,768,724
2033	1,176,088	2,609,805	3,785,893
2034	1,142,704	2,660,358	3,803,062
2035	1,108,972	2,711,260	3,820,232
2036	1,074,889	2,762,512	3,837,401
2037	1,040,457	2,814,113	3,854,570
2038	1,005,676	2,866,064	3,871,740
Total	11,579,803	26,364,974	37,944,777

Computer Modelling Results: Option 1 – 10 Parallel Routes CO₂e

Year	Emissions (tCO ₂ e)			
	Traded	Non-Traded	Total	Difference to baseline ¹¹
2029	1,306,595	2,412,264	3,718,859	+1643
2030	1,274,295	2,461,739	3,736,034	+1649
2031	1,241,995	2,511,214	3,753,209	+1655
2032	1,209,168	2,561,215	3,770,383	+1659
2033	1,175,991	2,611,567	3,787,558	+1665
2034	1,142,463	2,662,270	3,804,733	+1671
2035	1,108,584	2,713,324	3,821,908	+1676
2036	1,074,354	2,764,728	3,839,082	+1681
2037	1,039,773	2,816,484	3,856,257	+1687
2038	1,004,842	2,868,591	3,873,433	+1693
Total	11,578,060	26,383,396	37,961,456	+16,679

¹¹ Figures are rounded to the nearest tonne.

6.2 WebTAG GHG Workbook for Option 1 – 10 Parallel Routes

Greenhouse Gases Workbook - Outputs 1

Scheme Name: OSEP Midlands

Present Value Base Year

2023

Unit of account

Market prices

Current Year

2025

Proposal Opening year:

2029

Project (Road/Rail or Road and Rail):

Road

Overall Assessment Score:

Net Present Value of carbon dioxide equivalent emissions of proposal (£):

(Sum of traded and non-traded emissions - see note below on accounting for UK allowances in the traded sector)

-£4,778,145

*positive value reflects a net benefit (i.e. CO₂e emissions reduction)

Quantitative Assessment:

Change in carbon dioxide equivalent emissions over 60 year appraisal period (tonnes):

(between 'with scheme' and 'without scheme' scenarios)

16,679

*negative value reflects a net benefit (i.e. CO₂e emissions reduction)

Of which Traded

-1743

Change in carbon dioxide equivalent emissions in opening year (tonnes):

(between 'with scheme' and 'without scheme' scenarios)

1,643

Net Present Value of traded sector carbon dioxide equivalent emissions of proposal (£):

N.B. This value has been adjusted to account for the cost of emissions covered by the UK Emissions Trading Scheme (UK ETS), under the assumption that all assessed traded emissions are within the scope of the UK ETS. For further information, including guidance on the valuation of traded emissions outside the scope of the UK ETS, please refer to TAG Unit A3, section 4.1.

£256,053

*positive value reflects a net benefit (i.e. CO₂e emissions reduction)

Change in carbon dioxide equivalent emissions by carbon budget period:

	Carbon Budget 1	Carbon Budget 2	Carbon Budget 3	Carbon Budget 4	Carbon Budget 5	Carbon Budget 6
Traded sector	0	0	0	0	1036	-1945
Non-traded sector	0	0	0	0	5570	10325

Qualitative Comments:

Sensitivity Analysis:

(Traded and non-traded)

Upper Estimate Net Present Value of Carbon dioxide Emissions of Proposal (£):

-£7,109,338

Lower Estimate Net Present Value of Carbon dioxide Emissions of Proposal (£):

-£2,422,429

Data Sources:

7. Appendix B Analysis methodology and assumptions

- 7.1.1 The analysis for this ACP has used the most up-to-date and credible sources of data to assess the relevant impacts. These are referenced as part of this methodology.

7.2 Assessment period

- 7.2.1 The proposed Midlands Airspace change is currently anticipated to be implemented no earlier than November 2028, providing deconfliction with other operational deployments scheduled for 2028. Consequently, 2029 was adopted as the first year of implementation, in preference to modelling a partial implementation year covering only the final two months of 2028. The assessment therefore covers Year 1 (2029) and the subsequent 10-year appraisal period through to 2038 for both the baseline and proposed change scenarios.

7.3 Fuel Burn and CO₂e emissions

Baseline data

- 7.3.1 The baseline year for this analysis is 2025, representing the most recent full calendar year for which complete data is available.
- 7.3.2 The 2025 baseline dataset included 5,529 unique route permutations within Midlands Airspace.
- 7.3.3 Modelling every route permutation within a dataset of this size was considered significantly complex and, consequently, a representative subset of the 348 most heavily trafficked routes was selected for modelling. This subset accounts for approximately 93% of all traffic movements and 95% of annual fuel burn and CO₂e emissions within the current airspace structure, and is considered to provide an appropriate balance between model fidelity and the effort required to implement and assess the scenarios.
- 7.3.4 Aircraft types, city pairs, and requested flight level permutations across the 348 routes were modelled, resulting in 55,137 unique aircraft profiles that were subsequently simulated in an AirTOP¹² fast-time simulator model.

Flight profile simulation

- 7.3.5 For the baseline scenario, the Central Flow Management Unit (CFMU) flight-planned routings were imported into the AirTOP simulation model.
- 7.3.6 A corresponding proposed change scenario was developed by modifying the baseline routings in accordance with the proposed airspace design.
- 7.3.7 Four-dimensional (4D) flight trajectories were simulated for each flight in both scenarios using aircraft performance parameters derived from NATS Business Intelligence statistics, including observed climb and descent rates, speeds, and turn performance for Base of Aircraft Data (BADA) aircraft groups.
- 7.3.8 The route profiles used for the simulated flights in both the baseline and proposed change scenarios were based on flight plan routings.
- 7.3.9 Vertical constraints associated with UK standing agreements were modelled in accordance with the MATS Part 2.
- 7.3.10 Speed restrictions applicable within UK Terminal Control Areas (TMAs) were modelled in accordance with the MATS Part 2.

¹² AirTOP build version 2026.5.2.1.P5

- 7.3.11 Vertical constraints associated with published AIP procedures, including Standard Instrument Departures (SIDs) and Standard Arrival Routes (STARs), were applied throughout the simulations.
- 7.3.12 Abnormal operating scenarios, such as emergencies, diversions, go-arounds, and adverse weather events, were not modelled.
- 7.3.13 Traffic demand was assumed to be unconstrained, with no flow management regulations applied to the traffic sample. In addition, no arrival holding was modelled.
- 7.3.14 No tactical air traffic control interventions or trajectory optimisations were modelled, including vectoring and tactical speed or level adjustments.
- Fuel burn/ CO₂e calculations**
- 7.3.15 Fuel burn was calculated by processing the AirTOP simulated flight profiles through a fuel calculation model based on EUROCONTROL BADA performance equations. The model utilised BADA 4.2 where available, with BADA 3.16 applied to aircraft types not represented within the BADA 4.2 dataset.
- 7.3.16 Fuel burn estimates are based on median observed climb rates and speeds for commercial aircraft operating in NATS airspace, and account for aircraft type, altitude and assumed aircraft mass.
- 7.3.17 Carbon dioxide equivalent (CO₂e) emissions were calculated by multiplying the estimated fuel burn by a conversion factor of 3.1783652, in accordance with UK Government greenhouse gas conversion factors¹³.
- 7.3.18 To account for modelling uncertainty, an uncertainty adjustment has been applied to the claimed benefits, ensuring that the estimated ACP benefits are presented on a conservative basis.
- Calculated impact area**
- 7.3.19 All flights were modelled beyond the area affected by the change (approximately 100NM¹⁴) to ensure consistent entry and exit points and flight levels across the scenarios.
- Annualisation**
- 7.3.20 Annualised track mileage, fuel burn, and CO₂e emissions were calculated by determining the average impact per flight and multiplying this by the total annual number of flights.
- 7.3.21 Future annual traffic volumes were derived from the NATS Long Term Forecast (November 2025) and projected to 2029 and 2038. The forecast is based on EUROCONTROL STATFOR and Department for Transport (DfT) methodologies, supplemented by NATS intelligence to provide a refined estimate of future UK airspace demand.
- 7.3.22 The forecast does not assume any additional traffic growth resulting from airport developments currently subject to Development Consent Order (DCO) applications. Should these developments receive approval, traffic volumes within the region may be underestimated.
- CO₂e monetisation**
- 7.3.23 Annual traded and non-traded CO₂e emissions for both the baseline and proposed change scenarios were assessed using the Department for Transport's WebTAG methodology to calculate the present value of the change over the appraisal period.
- 7.3.24 For this assessment, approximately 67% of emissions were classified as non-traded. This reflects the predominance of long-haul operations within the traffic sample, particularly those operated by wide-body aircraft.

¹³ [ghg-conversion-factors-2026-full-set.xlsx](#)

¹⁴ The region bounded by 10W, 3E, 49.5N and 57N.

Fuel monetisation

- 7.3.25 Annual fuel savings were monetised using a derived fuel price of £0.6188/kg (£618.80/t), based on the average jet fuel commodity price between June 2025 and May 2026¹⁵, EUROCONTROL fuel density conversion factors¹⁶, and average GBP/USD exchange rates over the 180-day period from 31 December 2025 to 28 June 2026¹⁷.
- 7.3.26 Annual fuel savings were discounted using the HM Treasury Green Book discount rate of 3.5%.

7.4 Capacity/ Delay

Delay metric

- 7.4.1 C2 delay is a NATS performance metric that measures the average ATFM delay per flight attributable to NATS En Route Ltd (NERL).
- 7.4.2 C2 only includes delays arising from factors within NATS' control, such as capacity, staffing, airspace management, routing and equipment constraints.

Modelling approach

- 7.4.3 C2 delay was modelled using EUROCONTROL's Network Strategic Tool (NEST), which is widely used to assess traffic demand, sector capacity and ATFM delay across the European network.
- 7.4.4 NEST estimates delay by identifying where traffic demand exceeds available capacity and applying delay to bring demand within capacity limits. The model can also reflect operational assumptions such as controller availability, sector capacity and sector configuration.

Baseline data

- 7.4.5 NEST uses EUROCONTROL flight data, provided at the end of each AIRAC cycle, including flight plans and sector crossing information for all flights operating within the European network.
- 7.4.6 For this assessment, data from AIRAC 2506, 2507 and 2508 was used, covering the period from 12th June to 3rd September 2025 (summer 2025).

Assumptions

- 7.4.7 The modelling assumed summer 2025 controller resourcing, sector configurations, sector/traffic volume definitions and Special Use Airspace (SUA) activation patterns.
- 7.4.8 Traffic was modelled using flight-planned data only, with no sector resequencing, traffic re-routing, arrival holding, overflow measures, or adverse operational events (such as severe weather) included within the assessment.
- 7.4.9 The NEST model considers only delay arising from ATFM flow regulations and does not include other operational mitigations (e.g. Minimum Departure Intervals (MDIs), flight cancellations or traffic re-routing).
- 7.4.10 The assessment also excludes the cumulative effects of other ACPs and airspace management initiatives.

Annualisation

- 7.4.11 Future annual traffic volumes were derived from the NATS Long Term Forecast (November 2025) and projected to 2029 and 2038. The forecast is based on EUROCONTROL STATFOR and Department for Transport (DfT) methodologies, supplemented by NATS intelligence to provide a refined estimate of future UK airspace demand.

¹⁵ \$2.5574 per US gallon, <http://www.indexmundi.com/commodities/?commodity=jet-fuel&months=12>

¹⁶ 1 US gallon is equivalent to 3.073kg, Eurocontrol measures dataset

¹⁷ £1=\$1.3448, www.exchangerates.org.uk

- 7.4.12 The forecast does not assume any additional traffic growth resulting from airport developments currently subject to Development Consent Order (DCO) applications. Should these developments receive approval, traffic volumes within the region may be underestimated.
- 7.4.13 The NATS traffic forecast was used to estimate flight-planned demand for summer 2029 and summer 2038. These demand levels were then modelled in NEST to assess the impact of the proposed airspace change on delay performance.

Methodology

- 7.4.14 A baseline NEST model was developed using 2025 sector capacities. The model was calibrated by adjusting sector capacities until the simulated UK C2 delay aligned with observed 2025 performance.
- 7.4.15 The change scenario was then created by applying capacity uplifts to sectors affected by the Midlands Airspace change. These uplifts were informed by real-time simulation results and Subject Matter Expert (SME) judgment.
- 7.4.16 Three AIRAC cycles from 2025 were modelled in NEST. Collectively, these AIRACs accounted for approximately 56% of the total delay recorded during 2025.
- 7.4.17 Total UK C2 delay minutes and capacity regulations were extracted for both the baseline and change scenarios.
- 7.4.18 To derive annual estimates, the relationship between delay observed in the modelled AIRACs and total annual delay in 2025 was used to scale the model outputs. This approach enabled annualised estimates of delay to be produced for both scenarios.

Delay monetisation

- 7.4.19 The delay monetisation assessment converts forecast delay reductions into monetary values to quantify the economic benefits of the proposed airspace change.
- 7.4.20 The assessment uses industry-standard reference values from:
- EUROCONTROL Standard Inputs for Economic Analyses [Ref 7]
 - European Airline Delay Cost Reference Values (University of Westminster, Version 4.1), [Ref 8].
- 7.4.21 These two publications consider the sources of costs to airlines (for example fuel, crew, maintenance, passenger compensation, economic factors (inflation and exchange rates), and the fleet mix of affected aircraft) and provided referenceable values for these costs for various aircraft types. The resultant process is an estimation of the cost per minute of delay that airlines may experience on average.
- 7.4.22 Delay costs were calculated for both the baseline and change scenarios, with the difference representing the economic impact of the proposal. Future costs and benefits were discounted to a 2023 base year using a 3.5% annual discount rate.
- 7.4.23 Key assumptions were as follows:
- Aircraft were grouped into representative categories and weighted according to the modelled fleet mix.
 - Delay costs were updated using assumptions for inflation (2010 to 2026), 180-day average euro-to-sterling and euro-to-dollar exchange rates, and 12-month average fuel prices up to March 2026.
 - Delays were classified as:
 - <15 minutes: £10.73 per minute/flight
 - ≥15 minutes: £85.47 per minute/flight
 - All minutes within a delay event were costed using the rate associated with the total delay duration.

Constraints

- 7.4.24 The assessment of capacity/ delay is subject to a number of limitations and assumptions.

- 7.4.25 Delay costs are based on industry reference values rather than airline-specific data, with aircraft represented using fleet-weighted averages. While minor aircraft types were excluded from the fleet-weighting derivation, their associated delays remained included in the assessment.
- 7.4.26 Results are dependent on forecast traffic growth and modelled delay outputs, and capacity benefits are indicative, being derived from simulation outputs rather than full operational performance.
- 7.4.27 Traffic management interventions, cancellations, special events and other disruptive factors were not modelled and may therefore affect the accuracy of forecast delays and associated benefits.
- 7.4.28 Operational benefits may not be fully realised immediately following implementation, as the operation may require time to adapt to the new airspace design.
- 7.4.29 NEST provides an estimate of future delay and is not intended to predict delay with complete accuracy.
- 7.4.30 Future changes to economic assumptions, such as delay costs, may affect the monetised benefits presented. The assessment also does not account for future staffing changes or interactions with other airspace change initiatives.

8. Appendix C Glossary

4D	4 Dimensional
ACP	Airspace Change Proposal A formal application submitted to the CAA to change the design of UK airspace.
AIAA	Area of Intense Aerial Activity A designated airspace with a high volume of aircraft operations. These areas serve as warnings to pilots to remain highly vigilant for intensive manoeuvring, test flights, or training, and encourage them to obtain a Flight Information Service.
AIP	Aeronautical Information Publication Official publication containing aeronautical information required for air navigation.
AIRAC	Aeronautical Information Regulation and Control The internationally agreed system used to manage and publish significant aeronautical information changes on fixed dates so that pilots, air traffic controllers, airlines, flight planning systems, and chart providers all update their information at the same time
AMS	Airspace Modernisation Strategy A UK-wide program led by the Department for Transport (DfT) and the Civil Aviation Authority (CAA) seeking to modernize UK airspace to improve safety, increase capacity, and reduce environmental impacts.
ANG	Air Navigation Guidance Guidance issued by the CAA to support the development and assessment of Airspace Change Proposals
ANSP	Air Navigation Service Provider Organisation responsible for providing air traffic management and navigation services.
ATFM	Air Traffic Flow Management Process used to balance air traffic demand with available capacity.
ATS	Air Traffic Service A generic term for services provided to support the safe and efficient movement of air traffic, including air traffic control, flight information and alerting services.
BADA	Base of Aircraft Data A EUROCONTROL aircraft performance database used to model aircraft flight characteristics and fuel consumption.
CAA	Civil Aviation Authority The UK regulator responsible for aviation safety, airspace regulation and consumer protection.
CAS	Controlled Airspace Controlled airspace is an airspace of defined dimensions within which air traffic control services are provided to Instrument Flight Rules (IFR) flights and to Visual Flight Rules (VFR) flights in accordance with the airspace classification
CO_{2e}	Carbon Dioxide Equivalent Is a standard unit of measurement used to quantify the climate impact of all greenhouse gases (GHGs) by converting them into the equivalent amount of carbon dioxide (CO ₂) that would cause the same amount of warming.
CFMU	Central Flow Management Unit EUROCONTROL air traffic management system that optimizes and regulates flights across Europe.
CTA	Control Area A CTA is a volume of controlled airspace which begins at a specified altitude above the ground and extends to a defined upper limit.
DCO	Development Consent Order A single legal instrument used in England and Wales to grant planning permission and related statutory powers for Nationally Significant Infrastructure Projects.

DCT	(Direct) waypoint to waypoint routing, which does not use an airway. DCTs are published in the Rout Availability Document, Appendix 4.
DfT	Department for Transport The UK Government department responsible for transport policy, strategy and regulation.
DPE	Design Principle Evaluation A qualitative assessment used during Stage 2 of the CAP1616 airspace change process.
EAMTA	East Anglia Military Training Area
FOA	Full Options Appraisal A detailed assessment of shortlisted airspace design options to identify the preferred option and its impacts.
GA	General Aviation Refers to all civil aviation operations other than scheduled commercial air transport or military flights (e.g. recreational flying, pilot training, business travel, search and rescue, medical transport).
GHG	Green House Gas A gas that contributes to climate change by trapping heat in the atmosphere, including carbon dioxide (CO ₂).
IOA	Initial Options Appraisal An initial assessment of potential airspace design options used to identify options for further development and assessment.
kt	Kilotonne Equivalent to 1,000 tonnes.
LAC	London Area Control The NATS operation responsible for managing enroute air traffic within the London Flight Information Region.
LINCS	Lincolnshire
LTC	London Terminal Control The NATS operation responsible for managing arriving, departing and overflying traffic within the London Terminal Manoeuvring Area (LTMA).
LTMA	London Terminal Control Area Controlled airspace in the south of the UK, designed to manage the high volume of arriving and departing flights for London's major airports.
MATS	Manual of Air Traffic Services The UK publication that sets out procedures and requirements for the provision of air traffic services.
MDI	Minimum Departure Interval An MDI is an operational air traffic management measure used to regulate the spacing between departing aircraft, usually during periods of high demand or when downstream sectors have capacity constraints.
MTMA	Manchester Terminal Control Area Controlled airspace in the center of the UK, designed to manage the high volume of arriving and departing flights for Manchester and the surrounding airports.
NERL	NATS En Route Ltd.
NEST	EUROCONTROL's Network Strategic Tool.
NPV	Net Present Value The discounted value of the difference between the benefits and costs of a proposal over the appraisal period.
PC	Prestwick Control The NATS operation responsible for managing en-route air traffic within Scottish and North Atlantic airspace.
SID	Standard Instrument Departure

	A SID is a published, pre-defined flight path that pilots follow immediately after take-off under Instrument Flight Rules (IFR).
SME	Subject Matter Expert Someone who has specialized knowledge in a particular area of work or activity.
SoN	Statement of Need The SoN defines the sponsor's requirements for changing the airspace design, clearly outlining the specific issues, opportunities, and primary objectives of the proposed change.
STAR	Standard Arrival Route A published flight path used by arrival aircraft flying under Instrument Flight Rules (IFR). It bridges the gap between the cruise phase of flight, and the final approach to the destination airport.
SUA	Special Use Airspace Airspace established for specific activities or operations, where access may be restricted, prohibited or subject to particular conditions.
TMA	Terminal Control Area A controlled area established around one or more major airports to manage arriving and departing air traffic.
TRA	Temporary Reserved Area A volume of airspace temporarily segregated for the exclusive use of specific users (such as the military) during designated periods.
VFR	Visual Flight Rules Aviation regulations allowing pilots to operate aircraft in clear weather conditions –Visual Meteorological Conditions (VMC)— primarily by sight.
WebTAG	Web-based Transport Analysis Guidance The Department for Transport's transport appraisal guidance used to assess the economic, environmental and social impacts of transport proposals.