UK Civil Aviation Authority

Safety and Airspace Regulation Group

NATIONAL AIR TRAFFIC MANAGEMENT ADVISORY COMMITTEE

MINUTES OF THE 97th PLENARY MEETING HELD ON MS TEAMS ON 3 APRIL 2025

Present:

CHAIR

Jon Round	Head, Airspace, ATM & Aerodromes

REPRESENTATIVES OF MEMBER ORGANISATIONS

Mark Swan	ACOG
Tim Thomas	AEF
Adele Gammarano	AirportsUK
Matt Wilshaw-Rhead	AirportsUK
Mark Gibb	AOG
Martin Robinson	AOPA
Rupert Dent	ARPAS-UK
Christopher Birkett	Bae Systems
Mike Gunston	BBAC
Pete Stratten	BGA
Tim Fauchon	BHA
Andrew McDonald	BHPA
Capt Spencer Norton	British Airways
Andrew Amor	GAA
Mike Pearson	GAA
Luis Barbero	GATCO
Hal Newberry	HCAP
Jeremy James	HCGB
James Corkhill	Isle of Man CAA
Simon Tilling	Light Aircraft Association
Cdr Crompton	MAA
Cdr Gladwin	MoD DAATM
Michael Cockcroft	NATS
Cdr Plenty	Navy Command HQ
Lt Cdr Shears	Navy Command HQ
Timothy Nathan	PPL/IR Europe

CAA STAFF

David Woodward	NATMAC Secretary
Colin Chesterton	Manager, Airspace Modernisation Delivery
Julie Tovey	Principal Airspace Modernisation Programme Oversight
Rob Lewis	Manager, ATM and Aerodromes
Stephen Parry	Principal Airspace Regulator, Airspace Regulation (Utilisation)
Matthew Gee	Principal Airspace Regulator, Airspace Regulation
Akhil Sharma	Airspace Specialist (Engagement and Consultation)
Trevor Arnold	Project Manager FS&I
Colin Scott	Senior Manager, UK Airspace Design Service
Kevin Woolsey	Head of RPAS
Andrew Belshaw	Principal Future Airspace (Technical Systems)

Clair Woolsey	Test and Evaluation Lead
Kate Bromley-Fox	Manager, AAA Policy
Sally Franks	Policy Specialist Airspace & ATM
Stuart Lindsey	Head of Airspace Modernisation
Stuart McKay	CNS Principal

INDEX TO NATMAC 97 MINUTES

ANNEXES:

NATMAC 97 MINUTES

1. ITEM 1 – INTRODUCTION

1.1 The **Chair** welcomed representatives to the meeting.

2. ITEM 2 – NATMAC 96 MINUTES

2.1 **Secretary** explained that the minutes for NATMAC 96 had been distributing to attendees and other Committee members prior to the meeting. **Tim Fauchon (BHA)** explained that Action 4.7 had been closed however the action to close had not addressed his concern. **Secretary** explained that feedback had been given to the CAA Communications team and that he would ask them to send the feedback to the relevant departments. It was agreed that the action would remain closed from a NATMAC perspective.

Action: Secretary

2.2 In the absence of further comments, the **Secretary** advised the committee that the minutes for NATMAC 96 will be published on the NATMAC CAA webpage.

3. ITEM 3 – ACTION LIST FROM NATMAC 96 AND MATTERS ARISING FROM PROGRESS REPORT

3.1 The **Secretary** confirmed that seven actions were raised at NATMAC 96, five of which have been closed off, with two remaining open. The actions are documented in the progress report that was sent out ahead of the meeting.

3.2 The **Secretary** invited feedback/comments from the committee on the actions in the Progress Report. No comments or feedback raised.

4. ITEM 4 – CHAIR'S REPORT

4.1 **Chair** presented on the Chair's Report which had been distributed prior to the meeting.

4.2 **Martin Robinson (AOPA)** asked when the funding options related to UK Airspace Design Service (UKADS) will be discussed at NATMAC. **Colin Scott** explained that following on from consultation, there is a plan to publish a response document and a Ministerial statement in May 2025. The proposed timeline for the project is included in the UKADS slides but includes a statutory consultation on funding models in October. The key areas include a support fund for the FASI Masterplan ACPs. **Chair** reiterated that the question cannot be fully answered yet as the consultation has not yet occurred and therefore the CAA cannot provide any more information than is included in the presentation timeline.

5. ITEM 5 – AIRSPACE MODERNISATION DELIVERY TEAM UPDATE

5.1 **Trevor Arnold** presented on the UAS Operational Pathways Project.

5.2 **Pete Stratten (BGA)** asked how the CAA copes with pressure from government and industry to deliver on such projects versus the relative lack of understanding of the risks such activities pose due to the lack of maturity of this type of flying in the

industry. **Colin Chesterton** explained that most of the activity initially takes place in trial phases where data and collection allows the CAA and industry to paint a picture as to the risks. All trials will be used to validate or invalidate positions that the CAA has taken with regards to UTM, electronic conspicuity, C2 link etc. **Pete Stratten (BGA)** emphasised that his point raised was not suggesting that the UAS industry was not regulated enough, but that in some cases, such as the Open Category, the risk might be relatively low, however it is challenging to understand what the risk is now. **Colin Chesterton** explained that the CAA is working with Qinetiq to understand what the risk is in a drone versus GA aircraft scenario. This builds on work undertaken by EASA and will help to shape where the focus of the CAAs work will be in the future.

Action: Secretary

5.3 **Simon Tilling (LAA)** stated that he was concerned that smaller UAS impacting GA airframes may be considered acceptable by the CAA. He also voiced concern that a lot of UAS trials appear to be trying to achieve the same end goal and asked whether data gathered from previous trials could be made available to other users to reduce the number of trials undertaken. **Colin Chesterton** explained that some trials will appear to have common goals however from the data collection point of view, the CAA will be looking at different criteria in each one. Furthermore, if the trial is funded by the Airspace Modernisation Strategy (AMS) Support Fund, the CAA would expect sanitised data to be published. If the trial is a commercial operation, then the data would not be required to be made public however the CAA would still use the data to inform its position. **Simin Tilling (LAA)** suggested that it could be a condition of approving the ACP that data is made publicly available. **Colin Chesterton** stated that he would explore this suggestion.

Action: Colin Chesterton

5.4 **Matthew Wilshaw-Rhead (AirportsUK)** asked what consideration is being made, and what work is being undertaken by the CAA regarding public opinion on UAS operations to reassure members of the public that privacy and rights are being protected. AirportsUK is starting to see a small increase in airports receiving complaints related to UAS operations. **Colin Chesterton** explained that the Department for Transport (DfT) Future of Flight Industry Group (FFIG), rather than the CAA, is leading on work related to public opinion, however as part of the ACP the sponsor should undertake consultation, the outcome of which will feed into the CAAs decision making. **Matthew Wilshaw-Rhead (AirportsUK)** further explained that it goes beyond ACP work and includes flights in the Open Category where public may initially approach the local airport regarding a small UAS operation. He explained that this is a challenge that needs a solution.

5.5 **Martin Robinson (AOPA)** asked if BVLOS operations be subject to airspace containment and if so, how will this containment fit into the wider changes headed by the AMS in relation to lower airspace. **Colin Chesterton** stated that activities currently must be done in a trial environment with AMS aims, including integration, as the priority. The outcome of the trials will assist in mapping a path to the AMS goals of integration but will also point towards where containment may be required. **Martin Robinson (AOPA)** asked how this dovetails into the AMS and that the AMS needs to clearly show how this will look in the future and allow people to comment. **Colin Chesterton** explained that the AMS evolves every year as the CAA learns more about airspace activities and that the AMS vision will become much clearer.

5.6 **Jeremy James (HCGB)** asked if ADS-B was going to be made mandatory for everybody. **Colin Chesterton** explained that the work done so far looks at the technical requirements from both an aircraft and ground-based infrastructure point of view for electronic conspicuity. The ask from government is for the CAA to understand if, when and where a mandate may be required. The position will be clearer come October but there is no preconception that it would be a general mandate. **Jeremy James (HCGB)** further explained that helicopters will need to take off and land within the UAS Operational Pathways and therefore there would be a requirement for detect and avoid. He further stated that there needs to be a move away from Temporary Danger Areas (TDA). **Colin Chesterton** stated that there is a two-stage approach where the technical requirements are the first stage and then understanding how to enforce, or otherwise, the use of electronic conspicuity.

5.7 **Colin Chesterton** presented an update on electronic conspicuity.

5.8 **Timothy Nathan (PPL/IR)** stated that in relation to ground station awareness, almost all of them eliminate Surveillance/Source Integrity Level (SIL) 0 and System Design Assurance (SDA) 0. He stated that it is a better scenario to know about SIL 0 and SDA 0 rather than not knowing about them at all and asked if this is something that the CAA is considering. **Andrew Belshaw** stated that two workshops are taking place in April 2025 to address this topic.

5.9 **Martin Robinson (AOPA)** asked how platforms will behave both inside and outside managed airspace, with emphasis on wake turbulence and speed of UAS. He asked what consideration has been made regarding the impact on aircraft other than UAS, and what procedures may be put in place to manage this. **Colin Chesterton** stated that some of this will be covered by the SORA work where each operation is assessed for risk leading to a determined EC equipage level. Approval is needed for each operation under SORA.

5.10 **Pete Stratten (BGA)** stated that other technologies such as ADS-L, FLARM, and 5G contribute to airspace safety in other States. He asked if the EC Con Ops considers these technologies or is it focussed solely on ADS-B? **Andrew Belshaw** stated that the direction of travel is currently focussed on ADS-B with associated ground infrastructure such as Flight Information Displays (FID), however other technologies could be considered in the future. **Pete Stratten (BGA)** asked if the CAA does not see value in ADS-L and if the focus is developing ground infrastructure for ADS-B. **Andrew Belshaw** explained that the CAA is attempting to address the issue of non-interoperable equipment raised by GASCo in the Human Factors Report previously. **Pete Stratten (BGA)** raised a concern regarding who is going to pay for the ground infrastructure. **Colin Chesterton** explained that a business impact assessment with DfT is being conducted and that it has been made clear to DfT that the funding issue needs to be considered. **Timothy Nathan (TN)** stated that there are currently extant ground infrastructure systems that already exist and could be used at lower cost than creating a new system. **Colin Chesterton** stated that the Technical Working Group conducts studies in this area.

5.11 **Hal Newberry (HCAP)** stated that a review of the previously mentioned existing technologies that could be considered in the future should be conducted sooner rather than later before the CAA continues down the ADS-B route. **Colin Chesterton** stated that the Con Ops is underpinned by studies into other technologies. He confirmed that ADS-B to ADS-B in other aircraft is possible, therefore aircraft can communicate positions to each other.

5.12 **Pete Stratten (BGA)** voiced dissatisfaction with the topic and that he had discussed the issue with the CAA previously. He had been advised to wait for the Con Ops where his questions may be answered but now feels that the decision has already been made to use ADS-B. **Andrew Belshaw** stated that the Con Ops is not the final decision and that the document is under internal review before being published for consultation.

6. ITEM 6 – AIRSPACE MODERNISATION OVERSIGHT UPDATE

6.1 **Julie Tovey** presented AMS Key Achievements of Delivery and AMS Key Risks and Challenges Ahead.

6.2 No comments or questions were raised.

6.3 **Colin Scott** presented an update on UK Airspace Design Service (UKADS).

6.4 **Martin Robinson (AOPA)** asked if a consultation will take place to amend the NERL licence so that NATS can be involved in the design of airspace. Furthermore, he raised concerns that NATS is partly owned by Airline Group and that this may influence the design and accessibility of airspace for General Aviation (GA). He asked what safeguards will be put in place to ensure equitable access to airspace for all airspace users. **Colin Scott** stated that although the service will design airspace, the decision for the change itself sits with the CAA, or the Secretary of State if appropriate, and must comply with the CAP 1616 process. Section 70 of the Transport Act 2000 lays down the responsibilities of the CAA in respect of making airspace change decisions. He stated that the safeguards exist in legislation. **Chair** further stated that he does not see UKADS as a threat to GA. **Martin Robinson (AOPA)** reiterated that the Transport Act 2000 allows for charges to be levied on airspace users and further clarity is needed related to charges for the service.

6.5 **Pete Stratten (BGA)** agrees that ADS 1 is much needed to amend the London TMA. Concern was raised that NERL/NATS has an obligation to shareholders, and opined that careful oversight is required to ensure that Commercial Air Transport (CAT) does not over influence airspace changes, and that GA is protected.

6.6 **Mark Swan (ACOG)** stated that the funding mechanism will remain the same (En-Route). He also stated that the CAA has previously had a balanced view with consulting with GA and taking views into account. The CAA is still subject to legal challenge for airspace changes. An ACOG GA ambassador works to ensure that any GA concerns are flagged early in the process when mapping airspace changes. An independent GA impact assessment and statement must be completed for any coordinated ACP. **Martin Robinson (AOPA)** recalled the GA ambassador frustration at obtaining data to complete his work. **Mark Swan (ACOG)** confirmed that **Chair** had supported ACOG in obtaining data from the Airspace Analyser Tool and that NATS had agreed to release movement data to ACOG to overcome the issue of obtaining useful data.

6.7 **Andrew Amor (GAA)** stated that NATS does not have any GA experience but has a lot of experience with airline traffic. He asked if there are plans to include a GA representative within UKADS to create a balanced view to airspace changes. **Colin Scott** explained that an advisory board will be established to ensure a cross-stakeholder forum to allow for opinions to be voiced during airspace change discussions. The exact contrast of the forum is yet to be confirmed; however, it must be representative of airspace users and there is no intent to exclude any users from the discussion. **Chair** reiterated that he does not see GA being put at a disadvantage by UKADS and stated that the Committee input in this meeting on the topic has been helpful.

BREAK FOR LUNCH

7. ITEM 7 – AIRSPACE CHANGE ORGANISING GROUP (ACOG)

7.1 **Mark Swan** presented an update on ACOG activities.

7.2 **Rupert Dent (ARPAS UK)** asked how UAS data will go into the Flight Path Design Visual Repository. **Mark Swan (ACOG)** explained that initially the data will not be added however if a need for it is identified then it could be included but is subject to investment. Budget has been secured to complete Phase 1 of the project.

7.3 **Pete Stratten (BGA)** asked if 2029 onwards is a realistic target for airspace cluster projects to be delivered. **Mark Swan (ACOG)** stated that the current plan for the Manchester TMA aims to deliver in Q3 2029. Problems can occur if one airport in the cluster elects to pause work which can then bring the cluster work to a stop. Contingency is built into the programme, but timescales are subject to change.

8. ITEM 8 – GNSS JAMMING AND SPOOFING

8.1 **Stuart McKay** presented a briefing on GNSS Jamming and Spoofing.

8.2 **Timothy Nathan (PPL/IR)** asked if the CAA believes that SBAS Safety-of-Life (SoL) is a potential mitigation against GNSS jamming and spoofing and if so, would this form the basis of an argument for the UK to have it back? **Stuart McKay** agreed that it is a mitigation against jamming and spoofing. **Chair** agreed and stated that a statement was requested from DfT for the meeting but that the CAA did not receive one.

8.3 **Martin Robinson (AOPA)** explained that some operators in the Middle East use GLONASS receivers to mitigate against jamming and spoofing. He asked if we track GLONASS signals to determine if they are being interfered with. **Stuart McKay** explained that we do not track GLONAS signals. **Martin Robinsons (AOPA)** asked what input ICAO is getting from Russia with regards to the ICAO State Letter on this topic. **Stuart McKay** stated that Russia has not been engaging with ICAO much but that it may do soon.

8.4 **Matthew Wilshaw-Rhead (AirportsUK)** explained that a member airport was experiencing jamming, and that ASRs had been placed through the MOR scheme but that the information had not been fed back to the airport, therefore investigations could not take place at the time. Eventually, the source of the jamming was ascertained, and it became apparent that local delivery drivers were using jamming devices which had an effect on aircraft. A request was made for MOR feedback to be sent in a timely manner so that action can be taken.

9. ITEM 9 – LONDON HEALTH BRIDGE

9.1 **Clair Woolsey** presented a briefing on the policy work undertaken to enable the London Health Bridge project.

9.2 **Matthew Wilshaw-Rhead (AirportsUK)** welcomed the clarity that SORA brings, however raised a concern that some operators were seeing a SORA approval as a blanket approval which would allow them to operate without any further engagement with ANSPs. **Clair Woolsey** explained that issues such as this is generally picked up early in the process, but that effective comms is important to explain that ANSPs may still need to assess the operation, and any change required.

9.3 **Martin Robinson (AOPA)** asked how much influence the weather has had on the London Health Bridge flights. He also asked how the CAA has recovered its cost associated with this project. **Clair Woolsey** explained that application costs related to an ACP or a UAS application have remained the same. Costs related to the UAS operation are covered by the UAS operator. **Kevin Woolsey** explained the cost to the CAA relates to the number of hours spent evaluating the application, which is then paid by the applicant. **Clair Woolsey** then explained that the operation is not the only option for NHS logistics and that weather may affect flights, however other options for transportation are in place.

BREAK

10. ITEM 10 – RADIO TELEPHONY FAILURE PROCEDURES

10.1 **Sally Franks** presented a briefing on the differences between UK RTF procedures and those adopted by EASA.

10.2 No comments or questions were raised.

11. ITEM 11 – AIRSPACE CHANGE PROPOSALS UPDATE

11.1 **Matthew Gee** provided an update on all ongoing airspace change proposals.

11.2 **Tim Fauchon (BHA)** asked for an update on blue light PinS applications. **Matthew Gee** stated that they are currently being assessed.

11.3 **Jeremy James (HCGB)** asked when the Farnborough PIR would be published. **Chair** expects it to be by the end of May 2025.

11.4 **Pete Stratten (BGA)** stated that there are original agreements that were part of the establishment of Farnborough airspace, for example LoAs, that have still not been established. Is the CAA going back to stakeholders to establish if these agreements have been implemented or if they are still required? **Matthew Gee** agreed to investigate the issue raised.

Action: Matthew Gee

12. ITEM 12 – AOB

12.1 **Timothy Nathan (PPL/IR)** raised two items related to RNAV substitutions. The first related to airports withdrawing entire procedures, such as an ILS, because an NDB is unserviceable. As the NDB is not part of the final approach, **Timothy Nathan (PPL/IR)** stated that RNAV substitution can be used and the approach flown, therefore requested that the CAA document that procedures do not need to be withdrawn in circumstances such as this so that airports could be informed.
The second item relates to the use of DME on final approach. **Timothy Nathan (PPL/IR)** asked if DME is considered to be lateral navigation or vertical navigation as in the former case, a failed DME either in the aircraft or on the ground would not allow the ILS to be flown, or can the DME be substituted with RNAV on the ILS? A statement from the CAA clarifying the issue was requested.

Action: Secretary

12.2 **Rupert Dent (ARPAS-UK)** stated that in a recent letter from a Minister to the CAA CEO highlighted six areas related to RPAS that required focus from the CAA. Is funding being allocated to addressing these six areas? **Colin Chesterton** explained that the Future of Flight programme has been funded under Section 16 to cover the areas described in the earlier briefings.

12.3 **Martin Robinson (AOPA)** recalled a pre-meeting request from **Secretary** for potential agenda items for NATMAC. A presentation on UTM was requested but has not been included in the NATMAC 97 agenda. **Secretary** confirmed that the request was received however the CAA was not in a position to present on the topic at this meeting. The topic has been added to the list of topics to be considered for future meetings. **Chair** stated that there are two possible avenues for UTM to proceed down, the first being a separate system and the second being integrated with ATM. A globally unified position is required before more progress can be made. **Martin Robinson (AOPA)** further stated that the question is being driven by discussion around NATS OpenAir, to which **Chair** clarified that project is only part of a solution and is not the entire UTM solution. **Colin Chesterton** added that the first round of UTM con ops is scheduled to be out for consultation in the next three months. All of them are done on an iterative approach and are not the final decision.

Action: Secretary

13. ITEM 13 – DATES OF FUTURE MEETINGS

- NATMAC 98 – 1st October 2025
- NATMAC 99 – 15th April 2026
- NATMAC 100 – To be confirmed.

NATMAC 97 – ACTION LIST

Actions arising from NATMAC 97

2.1	**Secretary** explained that the minutes for NATMAC 96 had been distributing to attendees and other Committee members prior to the meeting. **Tim Fauchon (BHA)** explained that Action 4.7 had been closed however the action to close had not addressed his concern. **Secretary** explained that feedback had been given to the CAA Communications team and that he would ask them to send the feedback to the relevant departments. It was agreed that the action would remain closed from a NATMAC perspective.	**Secretary**
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5.3	**Simon Tilling (LAA)** stated that he was concerned that smaller UAS impacting GA airframes may be considered acceptable by the CAA. He also voiced concern that a lot of UAS trials appear to be trying to achieve the same end goal and asked whether data gathered from previous trials could be made available to other users to reduce the number of trials undertaken. **Colin Chesterton** explained that some trials will appear to have common goals however from the data collection point of view, the CAA will be looking at different criteria in each one. Furthermore, if the trial is funded by the Airspace Modernisation Strategy (AMS) Support Fund, the	**Colin Chesterton**

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entire UTM solution. **Colin Chesterton** added that the first round of UTM con ops is scheduled to be out for consultation in the next three months. All of them are done on an iterative approach and are not the final decision.

NATMAC 97 – GLOSSARY

(This Glossary is not necessarily limited to acronyms used in these Minutes, but is intended to assist members with the variety of NATMAC correspondence promulgated)

AAA	Airspace, ATM & Aerodromes
ACOG	Airspace Change Organising Group
ACP	Airspace Change Process
ADS-B	Automatic Dependent Surveillance – Broadcast
ADS-L	Automatic Dependent Surveillance – Light
AIP	Aeronautical Information Publication
	Administrative Incentive Pricing (spectrum)
AIMWG	Aeronautical Information Management Working Group
ANSP	Air Navigation Service Provider
AIWG	Airspace Infringement Working Group
AMS	Airspace Modernisation Strategy
ATM	Air Traffic Management
ATWP	Air Transport White Paper
ATZ	Aerodrome Traffic Zone
AWG	Airlines Working Group
BVLOS	Beyond Visual Line of Sight
CMIC	Civil/Military Interface Committee
DMO	Delivery Monitoring and Oversight
DfT	Department for Transport
DGCA	Director General of Civil Aviation
EASA	European Aviation Safety Agency
EHS	Enhanced Mode S
ELS	Elementary Mode S
ECAST	(EASA) European Commercial Aviation Safety Team
EGAST	(EASA) European General Aviation Safety Team
FAA	Federal Aviation Authority
FAB	Functional Airspace Block
FAB EC	Functional Airspace Block Europe Central
FASI	Future Airspace Strategy Implementation
FFC	Future Flight Challenge
FIS	Flight Information Service
FUA	Flexible Use of Airspace
GAWG	General Aviation Working Group
HMT	His Majesty's Treasury
ICAO	International Civil Aviation Organisation
IFP	Instrument Flight Procedures
LARS	Lower Airspace Radar Service

NATS	National Air Traffic Services
NPA	Notice of Proposed Amendment (EASA)
NSA	National Supervisory Authority
PinS	Point in Space
PPR	Planned and Permanent Redistribution of air traffic
PRC	EUROCONTROL Performance Review Commission
PRNAV	Precision Area Navigation
PSSTG	Public Sector Spectrum Test Group
RPAS	Remotely Piloted Aircraft System
RMZ	Radio Mandatory Zone
RICBAN	Regulatory Information and Co-ordination Board Area North-West
SARG	Safety & Airspace Regulation Group (CAA)
SASWG	Spectrum & Surveillance Working Group
SBAS	Satellite-Based Augmentation System
SES	Single European Sky
SES IR	SES Implementing Regulation
SESAR	Single European Sky ATM Research Project
SESAR JU	SESAR Joint Undertaking
SSC	Single Sky Committee
TDA	Temporary Danger Area
TMZ	Transponder Mandatory Zone
UAM	Urban Air Mobility
UAS	Unmanned Aircraft Systems
UAV	Unmanned Aerial Vehicle
UTM	UAS Traffic Management
WRC	World Radio Conference

Annex A: National Air Traffic Management Advisory Committee 97 - Minutes

National Air Traffic Management Advisory Committee (NATMAC) Meeting

NATMAC 97 Thursday 3rd April 2025

NATMAC 97 Agenda

- **11:00 - Meeting Start / Introduction**
- 11:05 – Minutes of NATMAC 96
- 11:10 – Action List / Progress Report
- 11:15 – Chair's Report
- 11:30 – Airspace Modernisation Delivery Team Update
- 12:15 – Airspace Modernisation Oversight and UKADS Update
- **13:00 – Lunch**
- 13:30 – ACOG Update
- 13:45 – GNSS Jamming and Spoofing
- 14:15 – London Health Bridge
- **14:35 – Coffee break**
- 14:45 – Radio Telephony Failure Procedures
- 15:05 – Airspace Change Proposal Update
- **15:50 – Wrap Up**

Annex A: National Air Traffic Management Advisory Committee 97 - Minutes

OFFICIAL - Named Parties Only. This information is intended for CAA and NATMAC members only

Chair's Report

OFFICIAL - Named Parties Only

Annex A: National Air Traffic Management Advisory Committee 97 - Minutes

Introduction

To **drive the evolution of UAS regulatory framework** from enabling demonstrations, to integrated operations at scale.

Introducing **'operational pathways'** which align a regulatory approach to **industry demand**, creating the common route, language and structure.

CAA Pathway Leads, break down the size of the challenge, mapping out their evolution and **identifying the incremental stepping stones**.

We prioritise efforts to enable incremental developments **through demonstrations** and testing hypotheses and drive **policy development**.

5

Operational Pathways

Operational Pathways

Pathway	CAA Technical Lead	Example use cases	Example operators	
Open Category	Darryl Abelscroft	Photography	>575,000	
Spec Cat VLOS	Ed Fitzpatrick	Industrial inspection	MARZANO, ARC	
Atypical Air Environments	Ed Fitzpatrick	Linear infrastructure inspection, large site security	sees.ai, heliguy, CYBERHAWK, Network Rail	PRIORITY
Developing & Testing New RPAS	Vikas Dangi	Testing new large & BVLOS aircraft	Callen-Lenz	
Integrated, low level BVLOS over urban areas	Emma Simpson	Last mile delivery	prime air, apian	PRIORITY
Fully integrated BVLOS	Emma Simpson	Middle mile delivery	FLYLOGIX, Skyports, TEKEVER	
State Aircraft	Rick Newson	Emergency services	BTP, NPCC	PRIORITY

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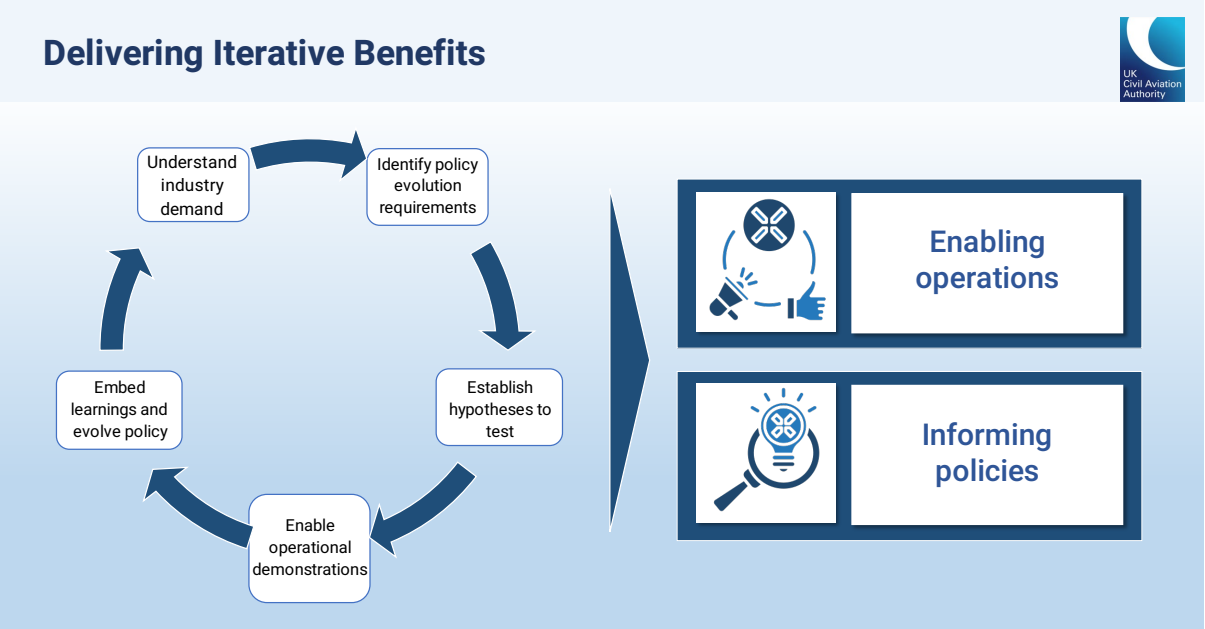
Annex A: National Air Traffic Management Advisory Committee 97 - Minutes



Annex A: National Air Traffic Management Advisory Committee 97 - Minutes

Background and Context

- Enabling several elements of the AMS, including but not limited to:
  - UK-ABN/4 Integration
  - UK-AM/7 Future surveillance
- In line with the AMS, and to enable FoF SO3, ADS-B will support both tactical air-to-air and strategic de-confliction of aircraft - a supporting mitigation for MAC.
- ADS-B technology provides protected aviation frequency, increased signal assurance and reliability as well as being an internationally recognised standard.
- *Setting the EC standard for GA and Specific Category BVLOS drones.*

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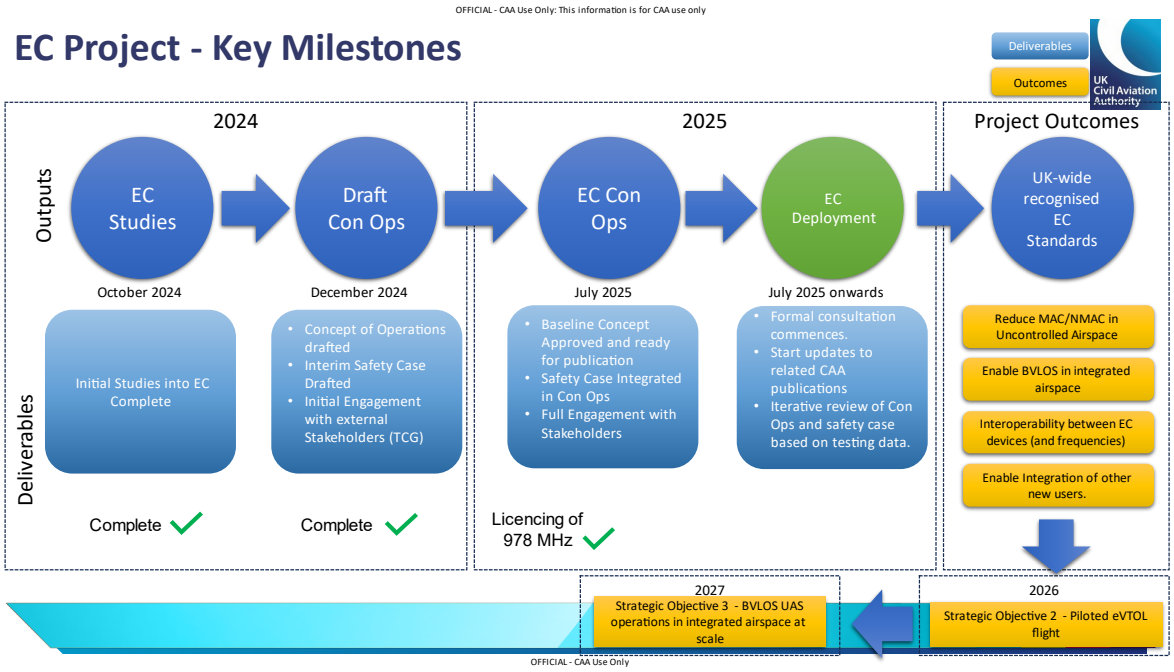

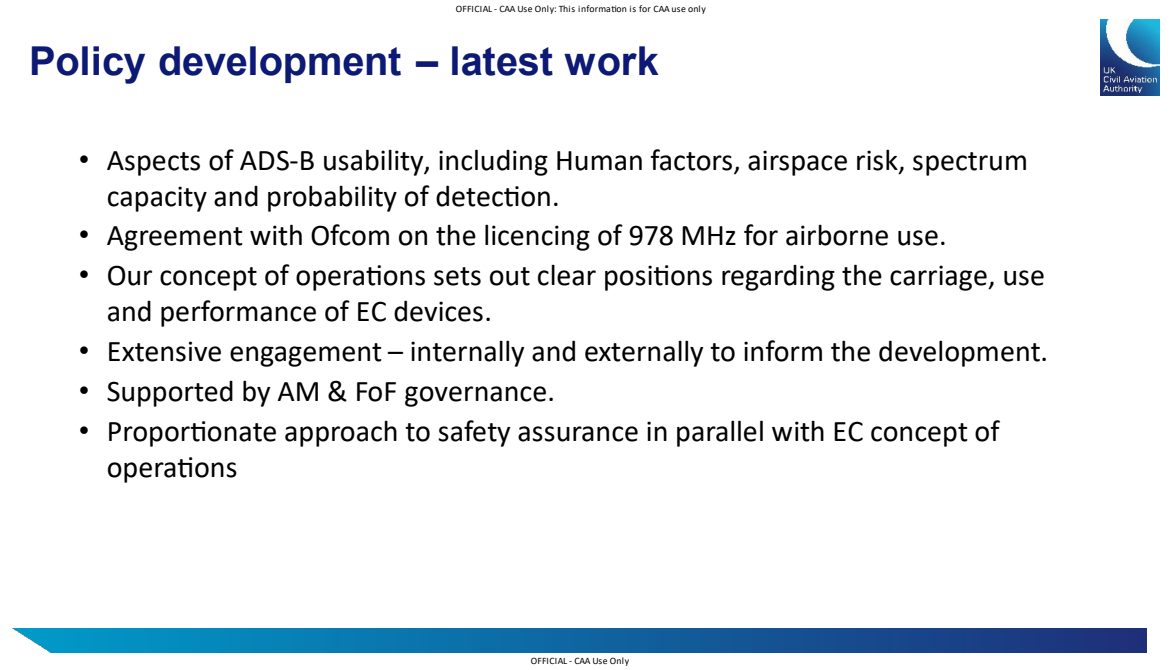

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EC Project – Concept of Operations Development

How will the Con Ops be structured?

- Executive Summary - EC at a glance.
- Background and history.
- Proposed CAA positions on EC.
- Next Steps & priorities.
- Strategic drivers.
- Summary of evidence from studies.
- Regulatory impact.

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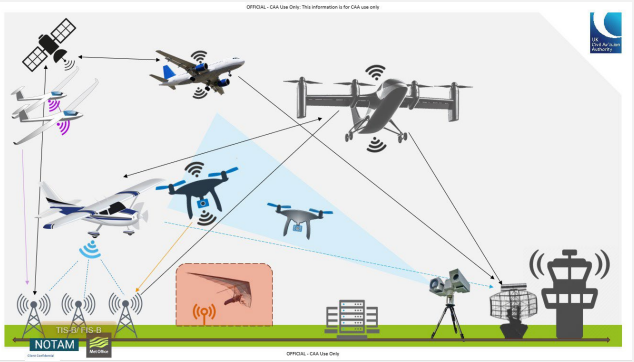
Ground Infrastructure Definition

Ground Infrastructure is an overarching term that encompasses existing and emerging physical equipment, systems and services required to support, enhance and assure electronic conspicuity and aid the situational awareness of airspace users.

The EC Airspace Architecture study introduces the concept of Ground Systems to support Manned and Unmanned aircraft.



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Questions ?

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Introduction

In 2017, the Government updated CAA's strategic role for airspace modernisation by issuing new Air Navigation Directions. Consistent with our role as specialist aviation regulator and our statutory responsibilities, we are required to prepare and maintain a co -ordinated strategy and plan for the use of UK airspace for air navigation, including for the modernisation of the use of such airspace.

Our Airspace Modernisation Strategy responds to that requirement, setting out the detailed elements that the industry must deliver, to achieve the objectives envisaged in the current Government policy.

To establish the means of delivering modernised airspace, such as the resources needed, the strategy requires the entities responsible for delivering the elements to draw up delivery plans, with progress overseen by the CAA.

The CAA must report to the Secretary of State annually on the delivery of the strategy and for the 7th time now the Airspace Modernisation Annual Progress Report fulfils that requirement.

The report is produced by the Airspace Modernisation Oversight team. The team is sat within the CAA's Communications, Strategy and Policy Department and is independent from the CAA delivery teams.

Category	AMS delivery elements	2018 AMS initiatives further developed through these elements
Aircraft-Based Navigation	UK-ABN/1. Trajectory-based operations	2, 7, 8, 11, 14
	UK-ABN/2. Terminal airspace redesign	4, 5, 14
	UK-ABN/3. Network management	3, 6
	UK-ABN/4. Integration	3, 9, 10, 11
Airspace Management	UK-AM/5. Airspace management	
	UK-AM/6. Data services	13, 15
	UK-AM/7. Future surveillance and spectrum	11, 12
	UK-AM/8. Integration of communications, navigation, surveillance & spectrum	12, 13, 14, 15
	UK-AM/9. Aircraft capabilities	New

Overarching principle: implementing government policy on minimising the environmental impacts of aviation within the context of supporting a strong and sustainable aviation sector

CAP 3084 Airspace Modernisation – 2024 Progress Report covers the delivery monitoring period of 1st January – 31st December 2024

JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC

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Content overview

Chapter 2– Progress Overview

AIRCRAFT BASED NAVIGATION
- Element 1 – Trajectory based operations
- Element 2 – Terminal airspace redesign
- Element 3 – Network management
- Element 4 – Integration

AIRSPACE MANAGEMENT
- Element 5 – Airspace management
- Element 6 – Data services
- Element 7 – Future surveillance and spectrum
- Element 8 – Integration of communications, navigation, surveillance & spectrum
- Element 9 – Aircraft capabilities

Chapter 1– Airspace Modernisation Risks & Mitigations

Airspace Modernisation Delivery Monitoring & Oversight Risks
Key Strategic Risks and Mitigations
Airspace Modernisation Strategy – 2024 Element Delivery Risk Status
Airspace Modernisation Part 3 UKCAA Delivery Milestones

Chapter 3– Progress Overview 2024– Industry Delivery (By Element)

Element 1: Trajectory – based Operations
Element 2: Terminal Re-Design
Element 3: Network Management
Element 6: Data Services

Chapter 4– Local Single Skies Implementation Plan

Element 1: Trajectory – based Operations
Element 2: Terminal Re-Design
Element 3: Network Management
Element 6: Data Services
Elements 7 & 8: Future Surveillance, Integration of Communications, Navigation Surveillance & Spectrum

Feedback on the Annual Progress Report can be submitted to airspace.modernisation@caa.co.uk

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Content overview

Chapter 5 – Co – sponsors' Update

Airspace Modernisation Co – sponsors
UK Airspace Design Service
UK Pilot Common Project (Commission Implementing Regulation (EU) No.716/2014) 80
Further Defining the 4th Strategic Objective of the AMS
Airspace Modernisation Oversight
Airspace Modernisation Development
UK CAA Airspace Modernisation Internal Governance
Airspace Modernisation Strategy Part 3: Deployment Plan CAP 1711b
Airspace Modernisation Strategy Support Fund

Chapter 6 – The Future of Flight

The Future of Flight Action Plan
Digitalising Specific Category Operations (DiSCO)
Unmanned Aircraft Systems

Feedback on the Annual Progress Report can be submitted to airspace.modernisation@caa.co.uk

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Strategic Risks

4 Key Strategic Risks

1) **Industry Synchronisation of the Technological Enablers for Airspace Modernisation with Airspace Change Deployments:** For industry to implement the major airspace change proposals under the Future Airspace Strategy Implementation (FASI) Programme and the required NATS (En Route) plc technical infrastructure upgrades to enable modernisation, the advice provided by NATS (En Route) plc indicates a window of 12-months between deployments to facilitate the training required and to minimise risk of disruption to successfully transition operations. Unless deployments are synchronised and coordinated effectively, the delivery of airspace change, and the subsequent intended benefits may be impacted or delayed.

2) **Non-Compliance with Assimilated Legislation Derived from The European Pilot Common Project (Commission Implementing Regulation (EU) No 716/2014):** The UK's assimilated Pilot Common Project has not been amended to reflect the changes made within the EU, apart from amendments to implementation dates by UK Statutory Instrument 2022 No.211. The named operators in the assimilated Pilot Common Project are likely to be non-compliant with a limited number of the Air Traffic Management functionalities required by the extant legislation.

3) **Resource and funding challenges in Airspace Modernisation:** Sponsors of airspace change in the Future Airspace Strategy Implementation (FASI) programme fund the airspace change proposals in the current delivery model; each sponsor of airspace change within the cluster may not have the available funding or resource required to progress at pace. Risk of insufficient resource or funding to modernise at the pace, and Gatwick iteration 3 is still pending a definite accepted decision and we're still on a minded to decision as they haven't passed Stage 3 yet and the gateway has been delayed.to the required standards, to meet the anticipated timelines expected by Government and stakeholders.

4) **Airspace Modernisation Strategy International Alignment and Coordination:** Requirement to synchronise modernisation and align with international delivery to aid interoperability. Risk UK modernisation efforts become incoherent, desynchronised or unable to leverage enabling capabilities with supporting international elements; thereby making the AMS less effective, efficient and deliverable.

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Element 1: Trajectory Based Operations

NERL Updates

Overall progress status remains RED.

- Free Route Airspace currently expected at the end of 2030, but benefits will not be realised until NERL implements new Flight Data Processing system (iTEC SkyNex) in 2035.

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Element 3: Network Management

NERL Updates

Overall progress status remains AMBER.

- Heathrow Time Based Separation Pairwise was deployed in December 2024 and Gatwick Time based Separation Advanced Mixed Mode was deployed in March 2025.
- Redeployment plans to be confirmed for the Arrival Manager Headbranch tool at Heathrow and Gatwick. Estimated delivery date Q1 2026.

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Element 6: Data Services

NERL Updates

Overall progress status remains RED.

- Stream 1 Prestwick Centre Upper Airspace (updated Flight Data Processor known as iTEC Version 2). NATS (En Route) plc are working on a recovery plan with an aim to complete this phase of work by end of Q2 2025. A revised deployment plan for Stream 1 will be shared with airline customers and the CAA pending the outcome of the review.
- Stream 2 Deployment of the new technological platform delayed from Q4 2024 to Q3 2025 due to extra time required from external managed service partners to complete transition planning.
- Stream 4 Deployment of Main Voice system delayed from Q1 to Q4 2027 due to supplier's challenges with the integration of Main Voice System into the current operational system which will require a greater use of NERL resources.

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Element 2: Terminal Airspace Redesign

ACOG Updates

Overall progress remains RED.

Numerous challenges balancing numerous operational, financial and regulatory challenges with some progress across clusters.

North of England Cluster: Completed the programme's 2nd major Air Traffic Control Development situation following the successful Scotland cluster simulation in 2023.

Q1 saw successful development simulations completed. Q3 saw Manchester and East Midlands reflect on results of simulations and refinement of their instrument flight procedure designs to move onto full options appraisal stage.

Liverpool resumed work on their ACP working towards key milestones

Q2 Leeds were unsuccessful in their Stage 2 gateway. New gateway date of February 2025.

Southeast Cluster: Slowdown awaiting outcome of UKADS. Several airports successfully passed their Stage 2 gateways: Biggin Hill, Southampton, Heathrow, Southend and Farnborough. Bournemouth were unsuccessful in their Stage 2 gateway in December 2024.

LAS: Q1 saw completion of the Public Engagement Exercise. Q2 saw Iteration 3 of the Masterplan submitted to the Co-Sponsors with a 'minded to' decision. Q4 saw Gatwick withdraw from their January 2025 gateway due to noise modelling issues.

South of Scotland Cluster: Q1 saw completion of the Public Engagement Exercise. The cluster saw the continuation of work on the full options appraisals, noise, and CO2 activities. In Q3, the cluster were unsuccessful at their Stage 3 gateways and is due to take place in 2025. It also saw a 'minded to' decision around Iteration 3 of the Masterplan. However, it cannot be formally accepted until the cluster's airspace change proposals progress through the CAP 1616 Stage 3 consult and engage gateway.

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Element 2: Terminal Airspace Redesign

ACOG Updates

Overall status remains RED.

Numerous challenges balancing numerous operational, financial and regulatory challenges with some progress across clusters.

West of England Cluster: In Q1 2024, the cluster resumed activities after pausing in 2023 due to funding and resourcing constraints at Cardiff and Exeter. During this period, only Bristol progressed to the Stage 3 gateway. Additionally, at the end of 2023, the Co-Sponsors approved Cardiff's withdrawal from the programme, necessitating a rebase lining of the cluster.

Exeter Stage 2 gateway was rearranged for March 2025.

In Q3 – Q4 2024, the Airspace Change Organising Group drafted an options paper as to a potential low-level split of the cluster, splitting the existing airspace change proposal into 2 separate entities due to the lack of Exeter's progress or the removal of Exeter altogether from the cluster. A decision will be made by the co-sponsors in 2025 whether to remove Exeter from the Future Airspace Strategy Implementation programme.

NATS (En Route) plc work with Bristol continued and made good progress throughout the year. Q3 saw this work continue regarding design refinement and engagement, with a further workshop in October.

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AMS Support Fund

OCT'24 Call for Proposals

- 22 applications received
- 6 were approved – currently in their onboarding process

Project	Sponsor	Description
A High Integrity Aircraft Surveillance Data Exchange	Neuron Innovations Ltd	This project proposes an enhanced Air Traffic Management provision by connecting individual airport's surveillance sensor feeds into a Data Exchange using its 'edge network' infrastructure, where airport data from one location is transmitted directly to and augments the surveillance picture of another.
Project RAPID	Volant Autonomy	The overall objective and primary outcome of this project is to provide feedback to inform, evidence and to support the adoption and the alignment of the three UK CAA Detect and Avoid (DAA) related policy documents.
4G & 5G Network At-Altitude Surveys	BT Group plc	This project aims to collect mobile network data at a number of spot locations from all UK mobile network operators (MNO's) at altitude (up to 500ft) to understand the performance of 4G and 5G across various altitudes and radio access network (RAN) clutter classes (Rural, Urban, Sub-Urban, etc.) within the UK.
Reduced Departure Divergence Functional Testing	Gatwick Airport	This project will ensure an impartial and suitably qualified third party to conduct functional testing of the Reduced Departure Divergence (RDD) concept in a real-world procedure design and operational context.
Reference Service Architecture Development	Egis Aviation UK	This project aims to develop a Reference Service Architecture (RSA) that will serve as a high-level blueprint of the service interfaces required to modernise airspace operations.
Arrival Sequence Optimisation	GE Aerospace	This concept depends on complementary tools that can stream aircraft onto arrival routes, meaning it takes measures to prevent aircraft from clustering at the beginning of these Performance-based Navigation routes.

FEB'25 Call for Proposals

- 12 applications received
- Currently in the review period
- Advisory Board will take place on the 7th May 2025
- Decision Board will take place on the 13th May 2025

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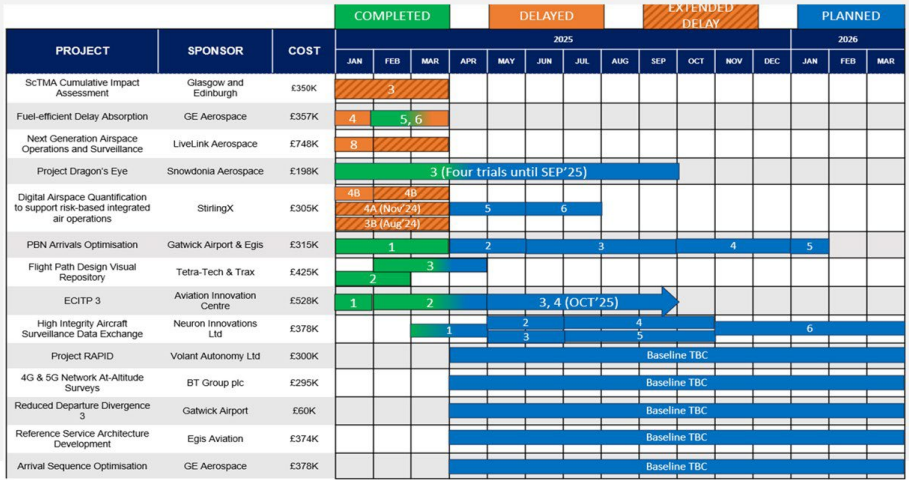
AMS Support Fund cont.

Total ASF Pot (Current funds + Paid to date)	Current funds in ASF pot (available to spend)	Committed Spend (all projects)	Paid to date (%)
£7.2m	£2.4m	£8.8m	£4.8m (55%)

PROJECT	SPONSOR	COST
ScTMA Cumulative Impact Assessment	Glasgow and Edinburgh	£350K
Fuel-efficient Delay Absorption	GE Aerospace	£357K
Next Generation Airspace Operations and Surveillance	LiveLink Aerospace	£748K
Project Dragon's Eye	Snowdonia Aerospace	£198K
Digital Airspace Quantification to support risk-based integrated air operations	StirlingX	£305K
PBN Arrivals Optimisation	Gatwick Airport & Egis	£315K
Flight Path Design Visual Repository	Tetra-Tech & Trax	£425K
ECITP 3	Aviation Innovation Centre	£528K
High Integrity Aircraft Surveillance Data Exchange	Neuron Innovations Ltd	£378K
Project RAPID	Volant Autonomy Ltd	£300K
4G & 5G Network At-Altitude Surveys	BT Group plc	£295K
Reduced Departure Divergence 3	Gatwick Airport	£60K
Reference Service Architecture Development	Egis Aviation	£374K
Arrival Sequence Optimisation	GE Aerospace	£378K



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2024 Annual Airspace Modernisation Progress Report Timeline & Part 3 Updated 2025 Timeline

Department for Transport

UK Civil Aviation Authority

Populating Annual Progress Report Chapters

31 JAN First draft complete

FEB Draft for review sent CAA (AMPB, AMSB, Legal, FOF) / ACOG / NATS

13 MAR Comments deadline

31 MAR Final draft sent to DfT

w/c 05MAY Report published

OCT | NOV | DEC | JAN | FEB | MAR | APR

AMS Part 3 2025 update

NOV-DEC 24 Format of the AMS Pt. 3 defined

JAN 25 Stakeholder engagement

- AAA
- FoF
- NERL
- ACOG
- MoD
- DfT

06JAN – 31 MAR Drafting period

- Chapter 1- Setting the scene
- Chapter 2 - Delivery activity and actions (rolling 1-2 years, plus up to 5 years view)
- Chapter 3 Horizon and beyond (5 years plus)

Apr/May 25 Final Draft Review Jun 25 Publication

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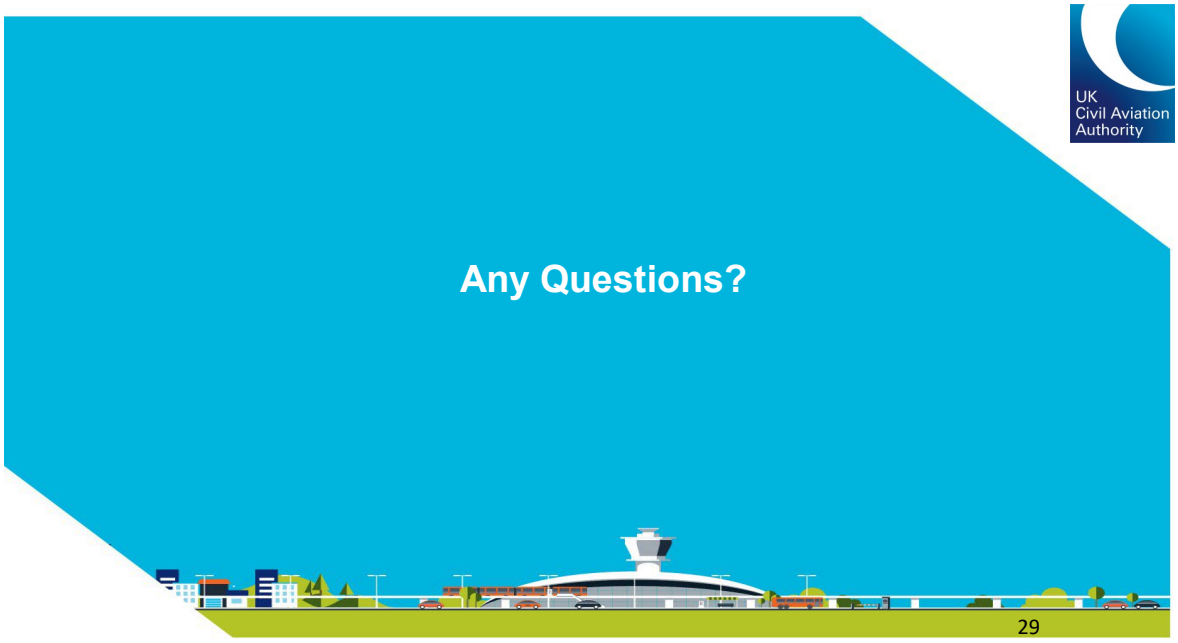

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Headlines

Department for Transport

UK Civil Aviation Authority

- Government confirmed on the 17 March, as part of HMT's announcement on UK regulators, that the UK was going ahead with both the Airspace Design Service and an Airspace Design fund to support eligible proposals outside of the ADS's initial area of responsibility.
- The UKADS consultation material has been reviewed, and a Consultation Response Document is being prepared. Overall respondents were supportive of the setting up an airspace design service.
- The initial scope for the new UKADS remains the London TMA region and the DfT, CAA and NERL are now collaborating on the establishment of the ADS.
- Workstreams ahead of the establishment of the UKADS: Regulatory Framework; UKADS funding model; Governance arrangements / resolution of issues

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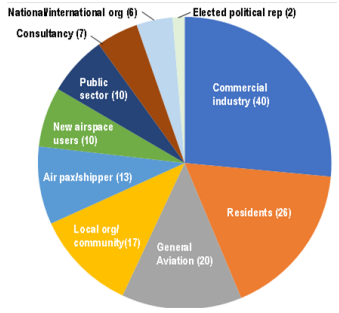
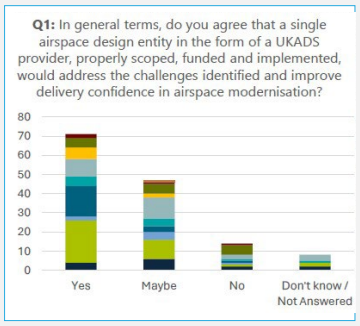
Consultation Response Document

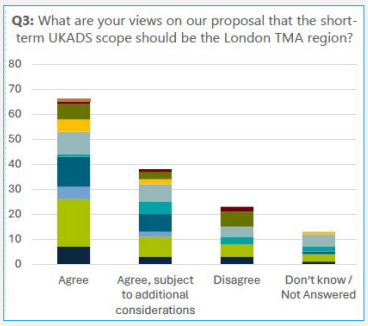
Department for Transport

UK Civil Aviation Authority

Very good range of respondents (total 151)







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Developing policy work

Department for Transport

UK Civil Aviation Authority

Governance	Funding
Before NERL can commence providing airspace design services, we will make an amendment to the Air Navigation Directions, lay new statutory instruments, and propose modifications to NERL's air traffic services licence to add airspace design services as a specified service. The DfT and CAA will require NERL, through the UKADS, to set the structure, membership and terms of reference of the Advisory Board. The Advisory Board will not be a decision-making body. The DfT/CAA will use existing AMS governance arrangements to monitor how NERL is responding to issues raised.	We will create a new UK Airspace Design Charge, paid by airspace users, which will be used to meet the efficient costs of NERL to provide an airspace design service and capitalise a new UK Airspace Design Support Fund to cover relevant costs of the sponsors of eligible UK airport ACPs that are outside the scope of the UKADS. When the scope of the UKADS evolves, we will consider whether and how the UK Airspace Design Support Fund and associated charging mechanism might be adapted in support of the objectives of the AMS.

Consultation on the license and charging mechanisms to commence in May 2025

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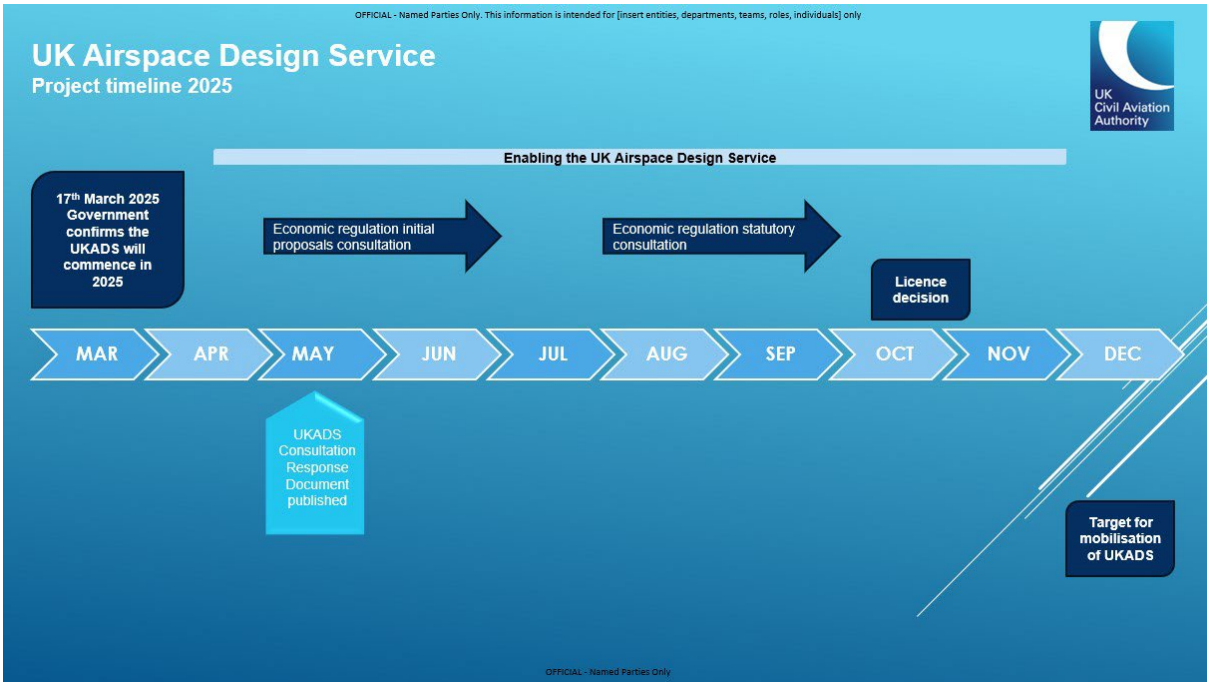
UK Airspace Design Service
Project timeline 2025

UK Civil Aviation Authority



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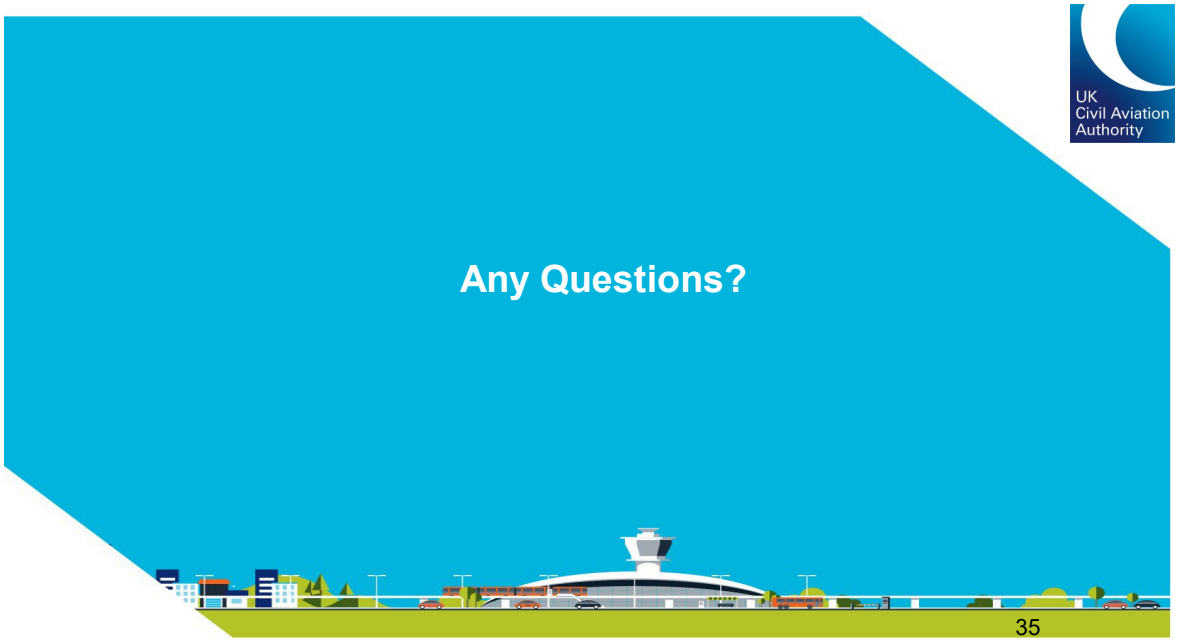

Lunch
1300-1330

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National Air Traffic Management Advisory Committee

Airspace Change Organising Group (ACOG) Update

ACOG

Airspace Change Programme Update– by cluster

WEST

- Bristol and NATS are preparing inputs for a Q2 2025 development simulation and defining the West Cluster consultation strategy.
- ACOG will deliver the Masterplan Iteration 3 for the West Cluster, with public engagement planned for Q2 -Q3 2025 (schedule to be confirmed).

NORTH

- Manchester and East Midlands are finalising designs below 7000ft. and Liverpool expects to integrate its IFP, resolving any design conflicts by Sept 25.
- ACOG will deliver the Masterplan Iteration 3 for the MTMA Cluster, with public engagement planned for Q3 -Q4 2025 (schedule to be confirmed).
- Leeds withdrew its April 2025 Stage 2 Gateway; a new target is July 2025.

SCOTLAND

- Edinburgh plans to submit for an updated Stage 3 Gateway in June 2025.
- Glasgow and NERL continue preparing for consultation around Q4 2025.

West
Bristol
Exeter

North
East Midlands
Leeds/Bradford
Liverpool
Manchester

Scotland
Edinburgh
Glasgow

Southeast
Biggin Hill
Bournemouth
Farnborough
Heathrow
Gatwick
London City
Luton
Manston
RAF Northolt
Southampton
Southend
Stansted

ACOG

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Airspace Change Programme Update– by cluster

LONDON AIRSPACE SOUTH

- NERL and Gatwick submitted a Stage 3 Change Request to the CAA, which has been accepted. Stage 3 submission is due 1 Aug 2025; Gateway is 26 Sept 2025.
- Stage 4+ milestone impacts are under review. A plan re -baseline request will be submitted in April 2025, pending CAA response and planning completion.

WIDER SOUTHEAST CLUSTER

- Most LTMA ACP sponsors have completed Full Airport Systems Options and are awaiting UKADS consultation outcomes to determine next steps.
- Farnborough and Southend passed their respective Stage 2 Gateways.
- Bournemouth did not pass its Stage 2 Gateway and is undergoing a full review.
- UKADS is the key dependency across the Southeast cluster, affecting timelines and planning certainty.

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Flight Path Design Visual Repository– Project Update

SCOPE

Uniform Designs
All designs stored to single standard

Analytics Generation
Creation of inputs required for environmental modelling, and display of results

Logging and Audit
Record-keeping of design decisions

Engagement Material
Off-the-shelf visualisations

Support Tools
Measurement, location search, KML export

TIMELINE

- Sponsor engagement
- Requirements and features definition

OCT 24

NOV 24

Initial build of DVR complete

- Gather and migrate flight path design data
- Build feature enhancements
- Complete system and user testing

JAN 25

APR 25

- Deliver training material and sessions to sponsors
- Undertake phased rollout of DVR

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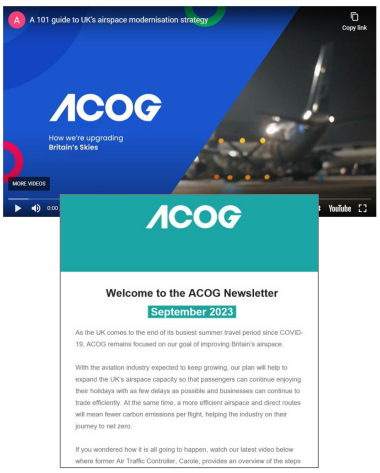
ACOG Communications and Stakeholder Engagement

Q1-2025 UPDATE

- ACOG is planning for two further rounds of public engagement to support Iteration 3 of the Masterplan in the West and MTMA Clusters, later in 2025.
- Efforts are underway to align ACP sponsors on coordinated consultation strategies and materials, with shared content on the system-wide proposal for each Cluster.
- ACOG engaged directly with MPs and Ministers, including targeted briefings and updates.
- Digital engagement continues to grow through newsletters, social media, and updates to the "One Sky One Plan" website, improving accessibility and reach.
- Broader outreach plans include focus groups, business round tables and participation in industry and community forums to build stakeholder understanding and support.



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ACOG

UK Civil Aviation Authority

Any Questions?

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GNSS Jamming & Spoofing

In recent years the commercial aviation industry has seen an exponential increase in incidences of GNSS jamming and spoofing, which have both become prevalent in specific geographic locations. EASA data shows that yearly GNSS RFI events reported in Europe increased from 3200 in 2022 to 12000 in 2024.

UK operators have supplied data through MORs received by the CAA which indicate 'hotspots' for this activity in certain geographical locations. While commercial aviation is not usually the target, it presents a tangible safety risk which can vary depending on aircraft equipage and system integration.

In the UK there is an increasing problem with so-called 'drive-by' jamming, where illegal jammers are used in vehicles and could have a localised impact.

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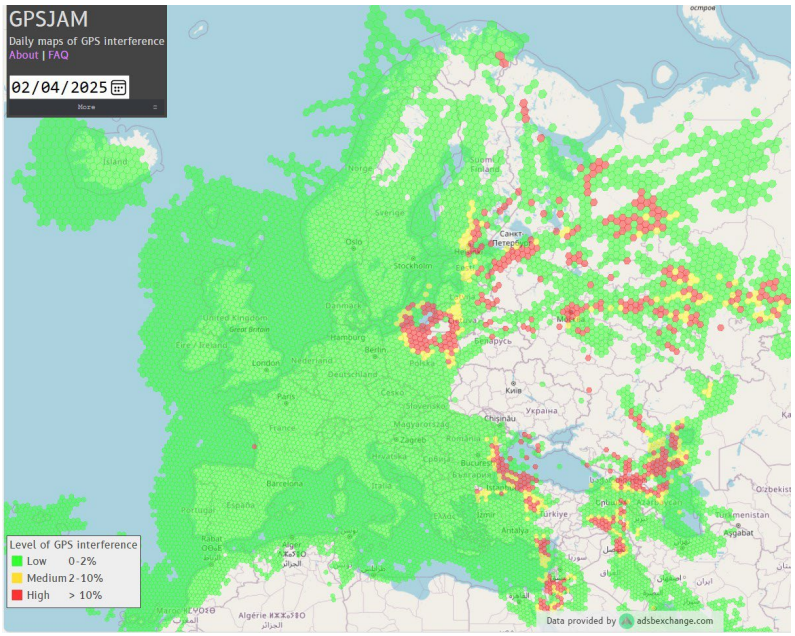

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Operational Effects

- GNSS RFI events cause degraded position and navigation capabilities on-board aircraft. Many aircraft and ground systems draw on GNSS data for precise timing and rely on it for their continuous and safe operation.
- Observed effects can vary in presentation and severity depending on several factors, including aircraft equipage and avionics integration. In general, aircraft with highly integrated avionics are more vulnerable to these impacts.
- The observed effects are not always predictable and therefore responses to mitigate these effects are not always clearly defined.

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Operational Effects

- Inability to use GNSS, and hybrid GNSS/inertial systems
- Loss of RNAV approach capability
- Inability to conduct or maintain RNP operations
- Unreliable triggering of terrain avoidance and warning systems, including pull up commands
- Position dependent flight management system effects e.g. insufficient fuel indications
- Abnormal differences between ground speed and true airspeed
- Erroneous ADS-B message outputs
- Data link and CPDLC message corruption or errors
- Potential airspace infringements and/or route deviations due to GNSS degradation

This list is not exhaustive, and the observed effects depend not onlyonly aircraft equipage but on how the systems are integrated.

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Recovery from a GNSS RFI event

Recovery from a GNSS RFI event depends on the type of interference taking place and is not always automatic. The effects can continue beyond the point at which the aircraft has exited the affected area if impacted systems cannot be restored during the flight.

This is called the 'latching effect' and is of particular concern because there could be inaccuracies which are not immediately noticed.

This phenomenon can continue into new airspace, impacting air traffic management – for example, a need for increased separation and thus reducing airspace capacity. On some occasions this has resulted in go-arounds or aircraft presenting unexpected behaviour from an Air Traffic Control (ATC) perspective, such as turns or climbs.

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Potential Mitigations

- Up to date, relevant NOTAMs to ensure that safety critical information on GNSS interference will receive proper attention
- Consideration of the risk of loss or degradation of GNSS capability when optimising ground navigation networks (for example, DME, VOR, ILS) and designing Minimum Operational Network (MON) ground infrastructure
- Complementary PNT solutions. For example, eLORAN
- Real-time monitoring of GNS RFI events and better information sharing
- Interference detection and GNSS/SBAS signal authenticators

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ICAO State Letter

On 30th April 2024 ICAO issued a State Letter on Aviation safety concerns regarding interference to the Global Navigation Satellite System (GNSS) which included recommendations from the ICAO EUR/MID Radio Navigation Symposium.

The recommendations targeted a number of stakeholders including CAAs, ANSPs, spectrum regulators, aircraft operators, equipment manufacturers and military authorities.

The issuing of this letter addresses the issue as a global one, and recognises GSS RFI as a widespread phenomenon and safety issue for civil aviation.

International Civil Aviation Organization | Organisation de l'aviation civile internationale | Organización de Aviación Civil Internacional | Международная организация гражданской авиации | منظمة الطيران المدني الدولي | 国际民用航空组织

Tel.: +1 514-315-1872

30 April 2024

Ref.: E 3/5-24/54

Subject: Aviation safety concerns regarding interference to the Global Navigation Satellite System (GNSS)

Action required: a) disseminate guidance material; and b) implement recommendations, as applicable

Sir/Madam,

1. I have the honour to bring to your attention the concerning escalation of jamming and spoofing activities targeting the global navigation satellite system (GNSS), which have been increasingly observed recently in various regions globally. GNSS, as one of the main enablers for performance-based navigation (PBN), provides navigation guidance for all phases of flight, from enroute through to precision approach. By providing accurate position and timing information, GNSS enables several systems critical to the safety of flight.

2. Since 2003, the International Civil Aviation Organization (ICAO) has been actively developing recommendations and guidance concerning GNSS Radio Frequency Interference (RFI). It is pertinent to recall ICAO Assembly Resolution A41-8, Appendix C: *Ensuring the resilience of ICAO CNS/ATM systems*, which serves as the latest ICAO policy on GNSS resilience.

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GNSS Jamming & Spoofing Safety Risk Working Group

The group was established in the summer of 2024 and the primary aims of the group are:

- Means of measuring current threat profile to UK AOC holders and ANSPs
- Short term activities to communicate and address these issues via operational mitigations
- Future potential threat profile research – specifically assumptions on system integration and integrity requirements
- Identify longer term aircraft system resilience requirements
- Scope out current UK Airspace threat exposure to known legitimate and potential illegitimate GNSS interference scenarios
- Identify future UK airspace capability and resilience requirements, and emerging options for detection and mitigation capabilities
- Monitoring and, if necessary, contributing to national and international forums to discuss GNSS jamming and spoofing threats
- Ensuring CAA future work streams account for the GNSS jamming and spoofing threats within their work and mitigate them accordingly at the fundamental systems engineering and policy development level
- Co-ordination of CAA safety communications on GNSS spoofing and jamming to various user groups

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Current Workstreams

- Consolidating information on affected systems and system integration to inform overall threat profile
- Prioritising safety risks associated with GNSS jamming and spoofing
- Analysing recommendations from the April 2024 ICAO State letter
- Engaging with DGAC to share experiences of, and potential mitigations against, GNSS jamming and spoofing

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Any Questions?

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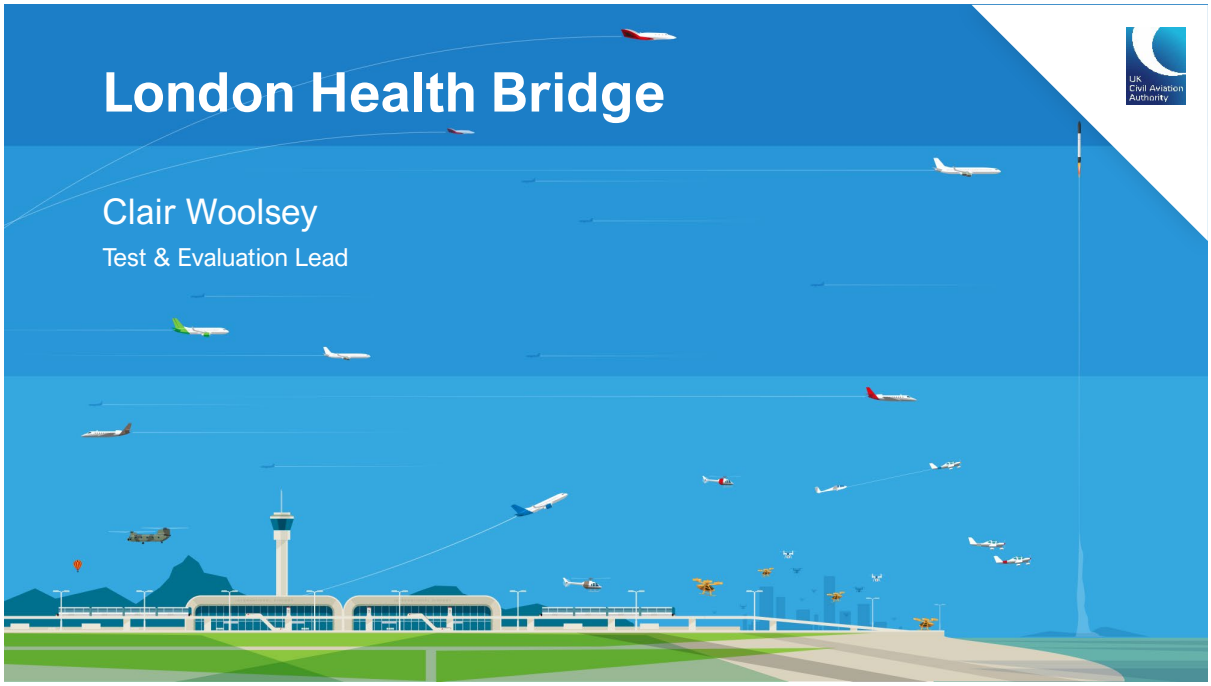

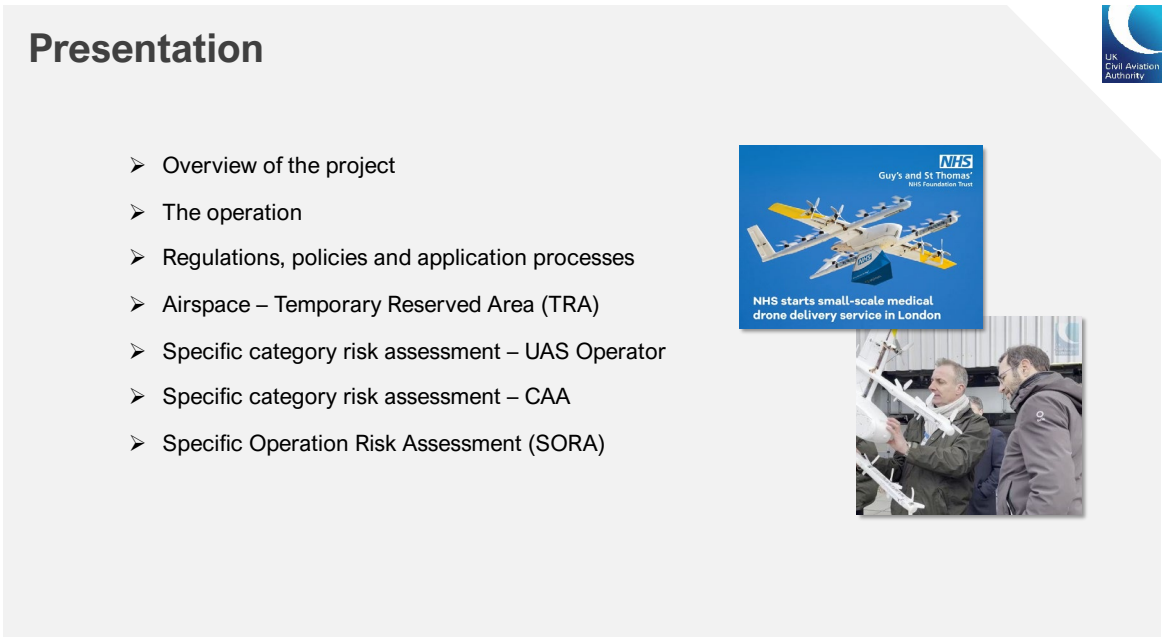

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Overview of the project

- **Apian** – healthcare logistics company and airspace sponsor
- **Wing** – UAS Operator
- **NATS** – ANSP

- Participant in CAA sandbox
- Temporary Reserved Area (**TRA**) within Class D
- Beyond visual line of sight (**BVLOS**) **medical delivery flights**
  - From Guy's to St Thomas' and return
- **Below 500 ft AMSL**

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The operation

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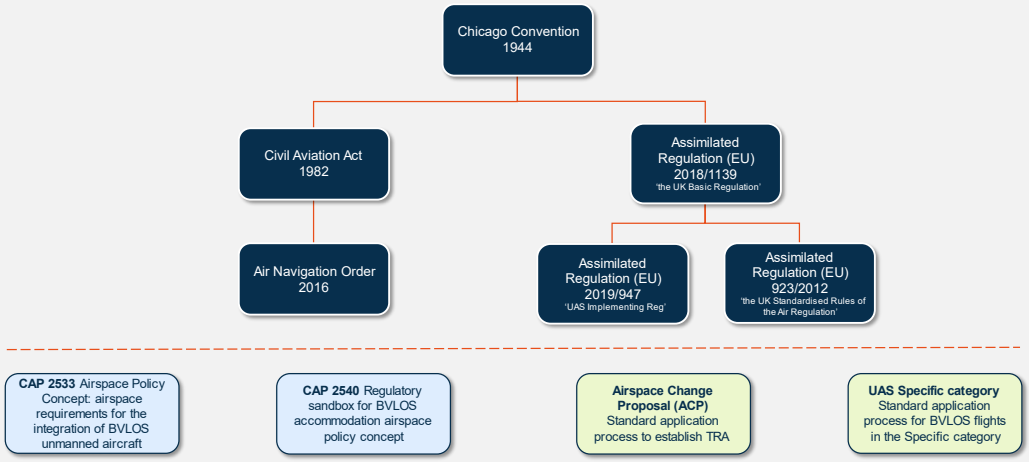
Regulations, policies and application processes



CAP 2540

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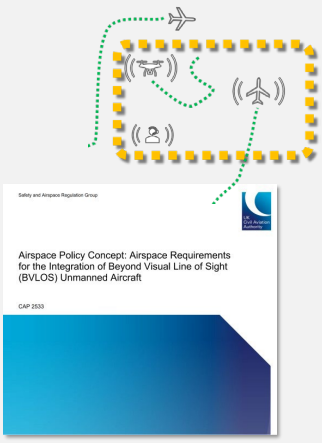
Airspace – Temporary Reserved Area (TRA)



- Airspace Modernisation Strategy **roadmap to future**
- CAP 2533 published to enable **transition** from segregation to integration
- TRA is 'airspace that is **temporarily reserved** and allocated for the specific use of a particular user during a determined period of time and through which **other traffic may or may not be allowed to transit** in accordance with the air traffic management arrangements notified for that volume of airspace (CAA)'
- Sandbox ensures **CAA resource** available to support projects:
  - Rules for each TRA
  - ANSP management and procedures
  - Technical capability of UAS
  - Competence of UAS crew
  - ACP and UAS application processes working in parallel
- Sandbox enables **data collection** to support **policy refinement** and **data-driven decision making**

CAP 2533

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Specific category risk assessment – UAS Operator

UAS Regulation

Consolidated Regulation, Acceptable Means of Compliance and Guidance Material to UK Regulation (EU) 2019/947 (as amended)

Article 11 Rules for conducting an operational risk assessment

- Describe the **characteristics of the operation**
  - Location, population density and airspace
  - Complexity
  - Technical features of UAS
  - Competence of personnel
- Proposed adequate **operational safety objectives**
- Identify the **air and ground risks**
- Identify a range of **mitigation measures**
- Determine the **necessary robustness** of the mitigations

Article 11

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Specific category risk assessment – CAA

Article 12 Authorising operations in the 'specific' category

1. The CAA shall evaluate the risk assessment and the robustness of the mitigating measures that the UAS operator proposes to keep the UAS operation safe in all phases of flight.

2. The CAA shall grant an operational authorisation when the evaluation concludes that:

(a) the operational safety objectives take account of the risks of the operation;

(b) the combination of mitigation measures concerning the operational conditions to perform the operations, the competence of the personnel involved and the technical features of the unmanned aircraft, are adequate and sufficiently robust to keep the operation safe in view of the identified ground and air risks;

(c) the UAS operator has provided a statement confirming that the intended operation complies with any applicable [...] rules relating to it, in particular, with regard to privacy, data protection, liability, insurance, security and environmental protection.

Article 12

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Specific Operation Risk Assessment (SORA)

JARUS

- Joint Authorities for Rulemaking on Unmanned Systems
- 71 national aviation authorities and regional aviation safety bodies
- CAA leads and participates in several workstreams

JARUS guidelines on Specific Operations Risk Assessment (SORA)

- Developed by JARUS along with NAA, safety bodies and industry
- Quantitative risk assessment methodology
- Work continues to develop JARUS SORA (UK SORA based on 2.5)


United Kingdom
Civil Aviation Authority
Official Record Series 9

CAA Decision to amend Acceptable Means of Compliance and Guidance Material pursuant to Article 76(3) UK Reg (EU) 2018/1139
DECISION No. 46
Publication date: 3 March 2025

Decision adopting Acceptable Means of Compliance (AMC) and Guidance Material (GM) for UK Regulation (EU) 2019/947

- UK SORA effective from 23 April
- UK SORA link to regulation changes here
- Collaboration across CAA teams
- Digital platform to support applicants

SORA

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Coffee Break
10 Minutes

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European Union (EU) Changes

Commission Implementing Regulation 2024/404

- Effective 01 May 2025
- Revised Radio Communication Failure (RCF) procedures introduced via new provision within EU version of the Standardised European Rules of the Air (SERA); SERA.14083

Background

- Ongoing ICAO review of RCF procedures within ICAO Annex 2 Rules of the Air to align RCF and lost C2 link procedures
- Initially expected November 2026, but now delayed until November 2028
- New EU procedures differ from those submitted to ICAO's Air Navigation Commission for approval by the Council
- Current UK RCF procedures differ from ICAO Standard and Recommended Practices and Procedures

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Significant Differences between SERA.14083 and UK RCF Procedures

IFR flights

- EU - maintain the last assigned speed and level, or minimum flight altitude if higher, for a period of **20 minutes**
- UK - Maintain for a period of **7 minutes**, the current speed and last assigned level or minimum safe altitude, if higher.

IFR flight encountering visual meteorological conditions (VMC)

- If the pilot-in-command decides to continue to fly in VMC:
  - EU - the pilot shall set Mode A Code **7601**
  - UK – Mode A Code remains **7600**

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CAA Actions

Impact Assessment

- If EU procedures are followed, in error, in London and Scottish FIR/UIR:
  - Requirement for ATC to "maintain separation between the aircraft experiencing the communication failure and other aircraft" (MATS Part 1 (CAP 493)) will mitigate any associated safety risk
  - SSR 3A 7601 is currently allocated to NATS as CCAMS Redundancy (Prestwick Upper)
  - SSR 3A 7601 will not 'flash' on ATC situation displays

CAA Decision

- UK RCF procedures will not change in response to EU change
- CAA will wait for ICAO State Letter on any proposed changes to ICAO RCF procedures

Actions

- Safety Notice - SN-2025/005 published
- SSR 3A 7601 code withdrawn from NATS allocation
- AIP to be amended to state"A7601 - Not in use within UK FIR"

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Any Questions?

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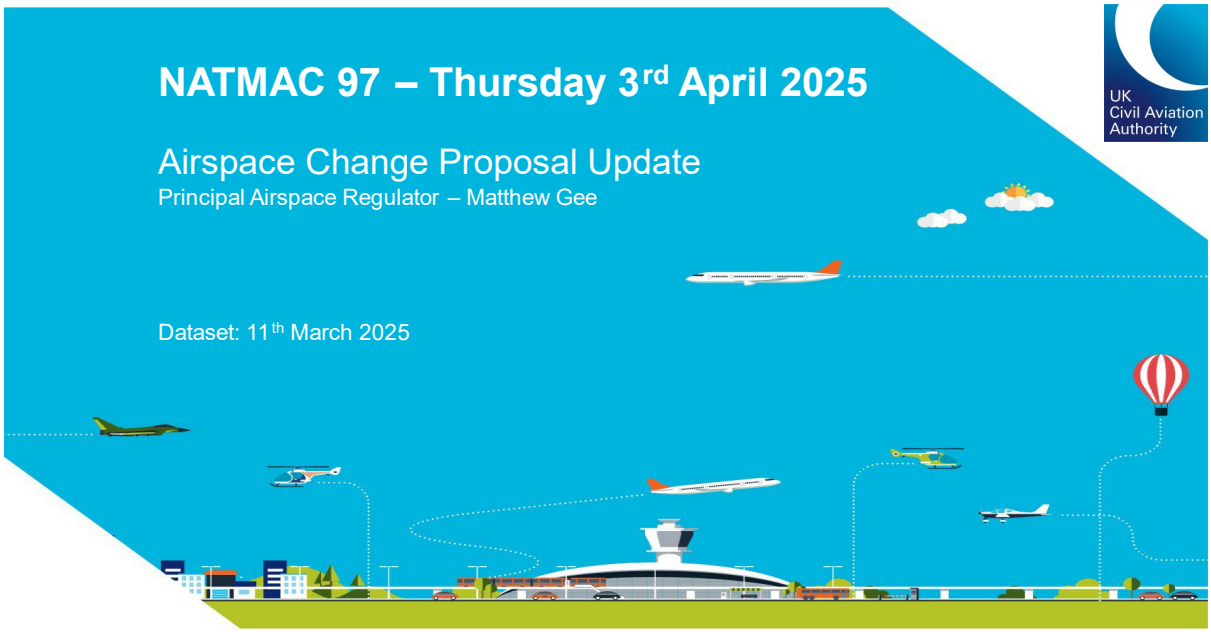
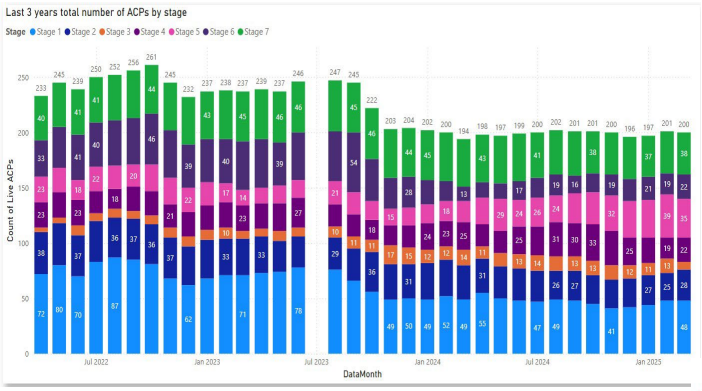
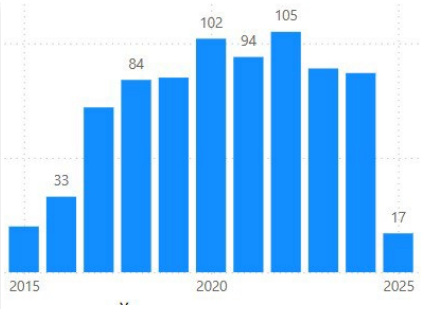


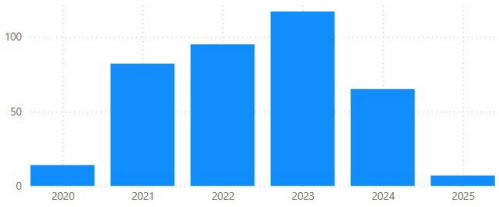
Trend Analysis – Airspace Change Proposals v Flow



Inflow



Outflow



- Inflow 2018 - CAP 1616 introduced and FASI initiated
- Overall reduction in ACPs despite large inflow in 2022
- Outflow usually completing 35 -50 Level per year, up to March 2025 these were included in the ACP stats. This accounts for 2025 change in outflow and inflow
- Approx 22 ACPs relate to CAP 725
- Approx 80 ACPs have an IFP dependency
- Dependent upon inflow we would expect to be below 180 ACP by Q4 2025

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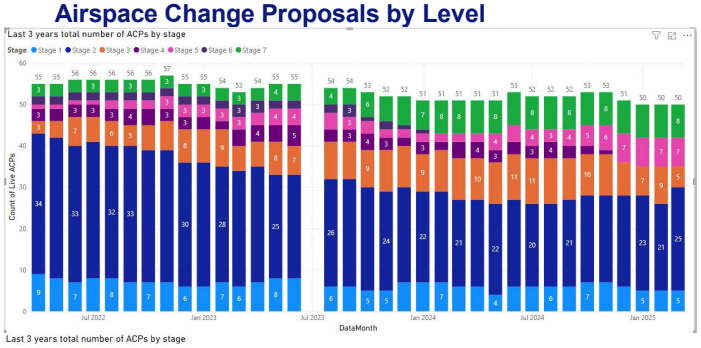
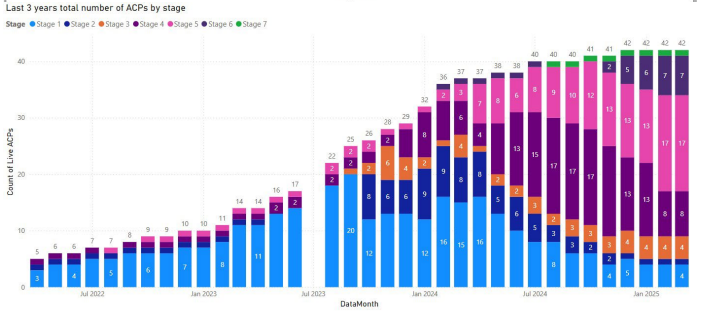
Airspace Change Proposals by Level



- Reduced total Level 1 changes since 2022.
- Low number of Level 1 ACPs in the early stages.



- Level 3 introduced in Jan 2024 as part of CAP 1616 version 5
- Existing ACPs transitioned across
- We are seeing an increase in Level 3 changes, where the colour differential indicates the increased speed through the process.
- We expect further acceleration aligned to IFP resource.

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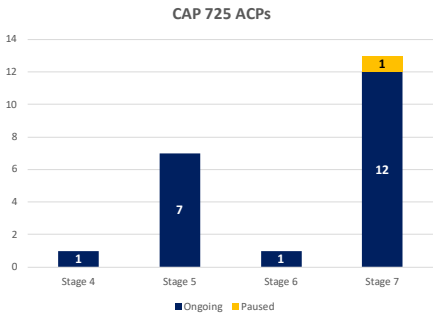
CAP 725 Airspace Change Proposals

CAP 725 total is 22 (21 ongoing & 1 paused):

- Pre-decision (with Change Sponsor): 1 (Stapleford IAPs)
- Decision Stage (with CAA): 7 (Inverness, St Mary's, Belfast Int, Southend, Haverfordwest, Hawarden, Teesside)
- Implementation (post decision): 1 (Neart na Gaoithe and Inch Cape TMZs)
- Post Implementation Review: 12

Significant Post Implementation Review

- ACP-2013-07 Farnborough: PIR ongoing
- Expect remainder of existing Stage 7s to be completed by Q4 2025



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Airspace Change Programmes
Future Airspace Strategy Implementation (FASI)

- **'LTMA' Cluster**
  - **15** ACPs currently within this Cluster
    - **15** 'In Progress',
    - **1** in Develop & Assess (Stage 2)
    - **14** in Consult (Stage 3).

- Bournemouth (Gateway TBC)

- Biggin Hill (Gateway TBC)
- Farnborough (Gateway TBC)
- Gatwick (Gateway Sept 2025)
- Heathrow R2 (Gateway TBC)
- LAMP2 D2 (Gateway Sept 2025)
- LAMP2 D3 (Gateway TBC)
- LAMP2 D4 (Gateway TBC)
- London City (Gateway TBC)
- Luton (Gateway TBC)
- Manston (Gateway TBC)
- Northolt (Gateway TBC)
- Southampton (Gateway TBC)
- Southend (Gateway TBC)
- Stansted (Gateway TBC)

- **'WTA' Cluster**
  - **4** ACPs currently within this Cluster
    - **4** 'In Progress', **0** 'Paused'
    - **1** in Develop & Assess (Stage 2)
    - **2** in Consult (Stage 3)
    - **1** in Stage 6 (Implement).

- Exeter (Gateway Mar 2025)
- Bristol (Gateway TBC)
- LAMP2 D1.2 (Gateway TBC)
- LAMP2 D1.1 (PIR TBC)

*Cardiff – removed from airspace change Masterplan coordinated process in July 2024

Airspace Change Programmes
Future Airspace Strategy Implementation (FASI)

- **'ScTMA' Cluster**
  - **3** ACPs currently within this Cluster
    - **3** 'In Progress', **0** 'Paused'
    - **3** in Consult (Stage 3).

- ~~Aberdeen*~~
- Edinburgh (Gateway Summer 2025)
- Glasgow (Gateway Summer 2025)
- NERL ScTMA (Gateway Summer 2025)

- **'MTMA' Cluster**
  - **5** ACPs currently within this Cluster
    - **5** 'In Progress', **0** 'Paused'
    - **1** in Develop & Assess (Stage 2)
    - **4** in Consult (Stage 3).

- Leeds Bradford (Gateway TBC)
- Liverpool (Gateway TBC)
- East Midlands (Gateway TBC)
- NERL MTMA (Gateway TBC)
- Manchester (Gateway TBC)

*Aberdeen – removed from airspace change Masterplan coordinated process in Sept 2023

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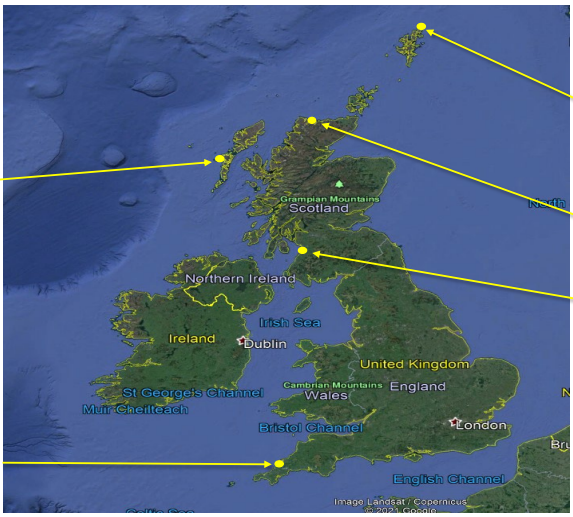
Space Launch Sites
Ongoing ACPs



Spaceport-1
Launch Operator TBC

Spaceport Cornwall
Launch Operator TBC

SaxaVord Spaceport
ABL
HyImpulse
B2Space
Skyrora

Space Hub Sutherland
Orbex

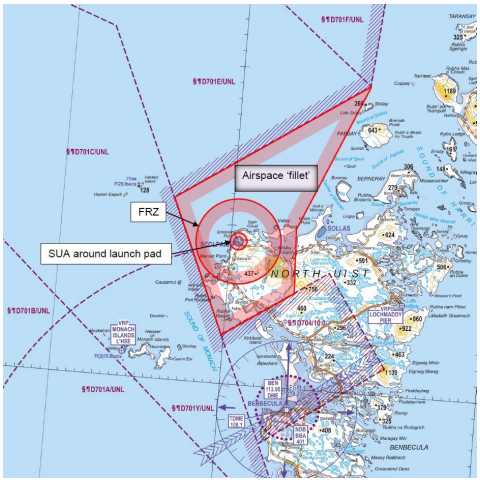
Prestwick Spaceport
Astraius

Airspace Change Proposals
Space Launches

Spaceport-1 (North Uist – Outer Hebrides)

- Permanent (ACP-2021-012):
- Currently in Stage 5 ('Decide')
  - CAA Decision expected April 2025
  - Target AIRAC 07/2025
  - Potentially subject to Secretary of State call-in
- Temporary (ACP-2021-037):
  - Paused in Stage 5 ('Decide')
  - Pending outcome of permanent ACP decision

Final proposed airspace design
ACP-2021-012 Spaceport-1 permanent



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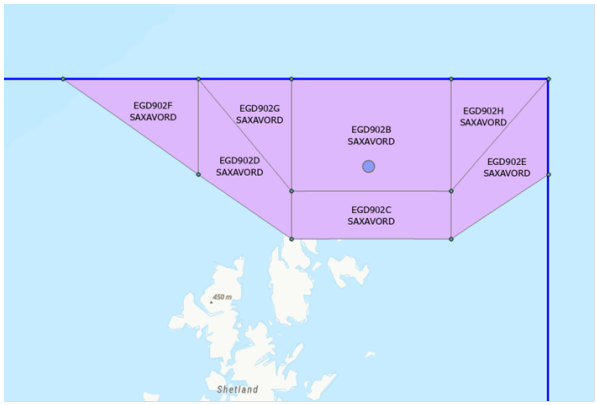
Airspace Change Proposals
Space Launches

SaxaVord Spaceport (Shetland Islands)

- Permanent (ACP-2017-79):
  - Consultation closed June 2023
  - Currently in Stage 5 ('Decide')
  - CAA Decision currently Paused to allow further development of the required operational LoAs and international agreements
- Temporary (ACP-2021-090):
  - Paused in Stage 5 ('Decide')
  - Pending outcome of permanent ACP decision

Final proposed airspace design
ACP-2017-79 SaxaVord Spaceport permanent



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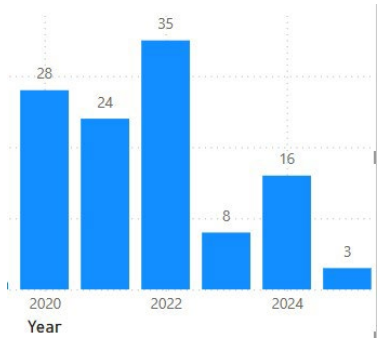
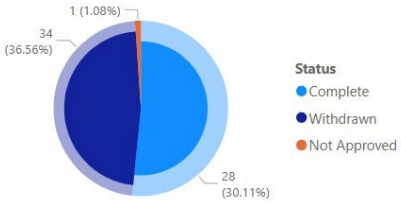
Temp/Trial (RPAS) related Statement of Needs submitted to CAA overtime

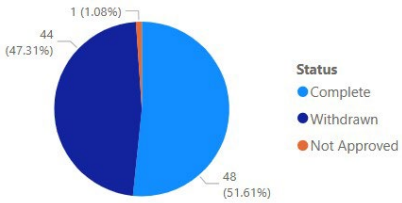
Inflow



Outflow for the period 2022-2024



Outflow for the period 2020-2025



- Overall reduction in RPAS related ACPs submitted since 2020
- Significant number of those submitted have been withdrawn by the Sponsor at Stage 1

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Temporary/Trial ACPs approved in last 6 months

- **ACP-2022-106 Solent Transport TDA**
  - Approved March 2025
- **ACP-2023-061 London Health Bridge – Guy's and St Thomas' NHS Foundation Trust (Apian)** TRA Sandbox
  - Trial Extension (6 months) approved in February 2025, to commence from April 2025.
- **ACP-2024-034 TDA for BVLOS Operations in the Central North Sea**
  - ACP approved March 2025.

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Ongoing Temporary Reserved Areas Sandbox Applications

- **ACP-2022-081 Establishment of a TRA for Trials of Manned and Unmanned Integration (Cranfield)**
  - Current stage: Assessment Meeting held in July 2024. ACP is paused whilst the sponsor progresses FID approval
- **ACP-2023-015 Northumbria NHS Air Grid**
  - Current stage: Stage 5 Decide, ACP is paused due to the withdrawal of the planning application for the proposed hub facility. An alternative location is being sought.
- **ACP-2023-061 London Health Bridge – Guy's and St Thomas' NHS Foundation Trust (Apian)**
  - Current Stage: Stage 6 Implement
- **ACP-2024-001 NATS BVLOS Loss in Segregated Airspace**
  - Current stage: Stage 5 Decide, CAA is awaiting a new timeline to accommodate the need for the sponsor to make updates to the ACP submission.

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Ongoing Temporary Reserved Areas Sandbox Applications

- **ACP-2024-035 NPAS BVLOS**
  - Current stage: Stage 5 Decide, final ACP proposal submitted to the CAA on 28 March 2025.
- **ACP-2024-041 Integrated BVLOS Ops Trial at Kirkwall Airport**
  - Current stage: Stage 4 Update and Submit
- **ACP-2024-056 Darlington and Surrounding Areas TMZ for BVLOS Drone Delivery Services (Amazon)**
  - Current stage: Stage 3 Engagement and Consultation
- **ACP-2025-001 Addition of TRA to Burbo Bank TMZ**
  - Stage 3 Engagement and Consultation
- **ACP-2025-008 Project Lifeline**
  - Stage 1 – Assessment Meeting scheduled for 4 April 25.

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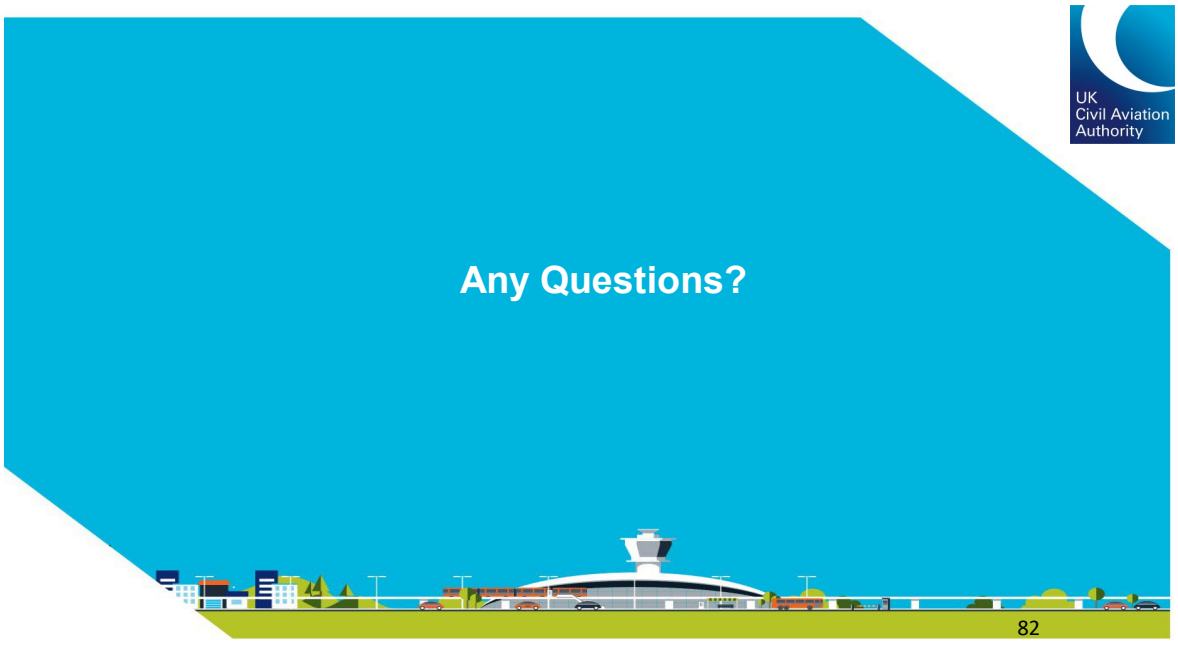

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AOB

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Dates of future NATMAC meetings

- NATMAC 98 – 1st October 2025
- NATMAC 99 – 15th April 2026
- NATMAC 100 – October 2026 (Date TBC)