



Manchester Airport

RNAV Substitution for eligible Procedures

ACP-2024-007 Assessment Meeting
Monday 20th May 2024



Agenda

1. Introduction/Apologies for (CAA)
2. Statement of Need (discussion & review) (Slide 3) (All)
3. Impact Assessment Review (Slides 4 & 5) (MAG)
4. Proposed solution (Slides 6-11) (MAG)
5. Proposed engagement (Slides 12 & 13) (MAG)
6. Proposed Level Change & justification (Slide 14) (MAG)
7. Habitat Regulations Assessment (HRA) (Slide 15) (All)
8. Safety & Compliance work (Slide 16) (MAG)
9. Proposed timescales (Slide 17) (All)
10. Next Steps, Questions and AOB (Slide 18) (All)

Statement of Need

As part of the national transition to performance-based navigation (PBN), NATS plans to remove from service most of the Doppler VHF Omnidirectional Range (DVOR) network in the UK. The DVOR and Distance Measuring Equipment (DME), based at Manchester Airport (MCT), will be removed from service as part of this national programme. All the existing Manchester SIDs and some Initial Approaches are dependent on the MCT DVOR and/or the MCT DME.

The Manchester Airport Future Airspace project (ACP-2019-23) will provide the long-term solution. On implementation ACP-2019-23 will remove dependency on the MCT DVOR/DME by providing Required Navigation Performance (RNP) SIDs and approaches to/from 7,000ft, from/to all four runways (Runway 23R, Runway 23L, Runway 05L and Runway 05R). In April 2023 MAG commenced a project to ensure the continuity of operations between January 2026 and the implementation of the Future Airspace project.

In the IA each of the arrival/departure procedures was analysed to consider the most appropriate solution. The preferred solution, identified for the SID and Initial Approach Procedures, is to utilise 'RNAV substitution', as detailed AIP EGCC 6-1 – 6-6 and EGCC 7 series respectively. 'Substitution' would provide an interim measure with FMS coding provided to aircraft, that would allow airlines to continue flying existing profiles without the ground-based assets.

Impact Assessment - Review

Option	NPR Chart	CTR/CTA Chart	ATSMAC Chart	KUXEM 1R/1Y EKLAD 1R/Y	ASMIM 1S/1Z	POL 5R/1Y/ 4S/1Z	DESIG 1S/1Z SONEX 1R/1Y	LISTO 2S/2Z/ 2R/2Y* SANBA 1R/1Y
Do-Nothing	Possible Option	Possible Option	Possible Option	Unviable Option	Unviable Option	Unviable Option	Unviable Option	Unviable Option
Remove Procedures	Viable Option	Possible Option	Possible Option	Unviable Option	Unviable Option	Unviable Option	Unviable Option	Viable Option
Level 1 ACP	Unviable Option	N/A	N/A	Unviable Option	Unviable Option	Unviable Option	Unviable Option	Unviable Option
Use other DVORs	Unviable Option	N/A	N/A	Unviable Option	Unviable Option	Unviable Option	Unviable Option	Unviable Option
SID Truncation	Unviable Option	N/A	N/A	Unviable Option	Unviable Option	Unviable Option	Unviable Option	Unviable Option
ODDs	Unviable Option	N/A	N/A	Unviable Option	Unviable Option	Unviable Option	Unviable Option	Unviable Option
Own the DVORs	Unviable Option	N/A	N/A	Unviable Option	Unviable Option	Unviable Option	Unviable Option	Unviable Option
RNAV Substitution	Viable Option	Viable Option	Viable Option	Viable Option	Viable Option	Viable Option	Viable Option	Viable Option

Impact Assessment - Review

Option	ILS/DME (I-MC) 05R	ILS/DME (MCT) 05R	LOC/DME 05R	VOR/DME 05R	ILS/DME (I-MM) 05L	ILS/DME (MCT) 05L	LOC/DME 05R	VOR/DME 05R
Do-Nothing	Unviable Option	Unviable Option	Unviable Option	Unviable Option	Unviable Option	Unviable Option	Unviable Option	Unviable Option
Remove Procedures	Unviable Option	Viable Option	Unviable Option	Viable Option	Unviable Option	Viable Option	Unviable Option	Viable Option
Level 1 ACP	Unviable Option	Unviable Option	Unviable Option	N/A	Unviable Option	Unviable Option	Unviable Option	N/A
Use other facilities	Unviable Option	Unviable Option	Unviable Option	Unviable Option	Unviable Option	Unviable Option	Unviable Option	Unviable Option
Own the facility	Unviable Option	Unviable Option	Unviable Option	Unviable Option	Unviable Option	Unviable Option	Unviable Option	Unviable Option
RNAV Substitution	Viable Option	Unviable Option	Viable Option	Unviable Option	Viable Option	Unviable Option	Viable Option	Unviable Option
Option	ILS/DME (I-NN) 23R	ILS/DME (MCT) 23R	LOC/DME 23R	VOR/DME 23R	RNP 23L	VOR/DME 23L		
Do-Nothing	Unviable Option	Unviable Option	Unviable Option	Unviable Option	Viable Option	Unviable Option		
Remove Procedures	Unviable Option	Viable Option	Unviable Option	Viable Option	N/A	Viable Option		
Level 1 ACP	Unviable Option	Unviable Option	Unviable Option	N/A	N/A	N/A		
Use other facilities	Unviable Option	Unviable Option	Unviable Option	Unviable Option	N/A	Unviable Option		
Own the facility	Unviable Option	Unviable Option	Unviable Option	Unviable Option	N/A	Unviable Option		
Amend Procedures	Viable Option	Unviable Option	Viable Option	Unviable Option	N/A	Unviable Option		

Proposed Solution

AD2.21 Noise Abatement Procedures

ATC CLEARANCE (SID)	Description	ATC CLEARANCE (SID)	Description
LISTO 2S	As per the LISTO 2S SID as detailed in Chart AD 2.EGCC-6-3 as far as LISTO or passing 5,000ft whichever is the sooner.	LISTO 2Z	As per the LISTO 2Z SID as detailed in Chart AD 2.EGCC-6-3 as far as LISTO or passing 5,000ft whichever is the sooner.
ASMIM 1S	As per the ASMIM 1S SID as detailed in Chart AD 2.EGCC-6-2 as far as ASMIM or passing 4,000ft whichever is the sooner	ASMIM 1Z	As per the ASMIM 1Z SID as detailed in Chart AD 2.EGCC-6-2 as far as ASMIM or passing 4,000ft whichever is the sooner
POL 4S	As per the POL 4S SID as detailed in Chart AD 2.EGCC-6-5 as far as POL D15 or passing 4,000ft whichever is the sooner.	POL 1Z	As per the POL 4S SID as detailed in Chart AD 2.EGCC-6-5 as far as POL D15 or passing 4,000ft whichever is the sooner.

Etc etc for all other SIDs:

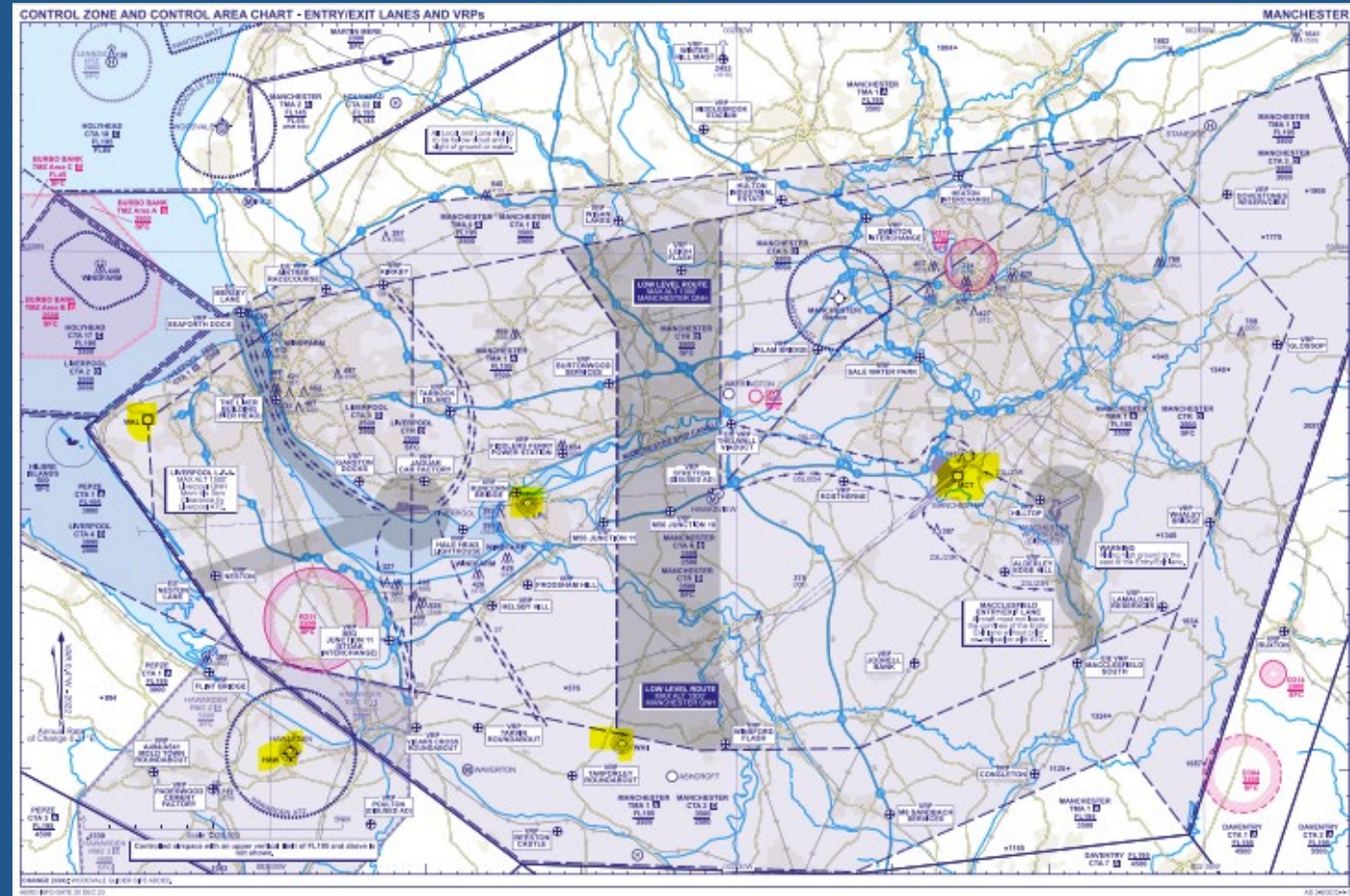
- 1) this provides a far more accurate description of each current NPR specific to each SID and makes it clearer to both flight crew where the NPRs end
- 2) It also remove any reference to any ground-based navigation aid leaving the SID to description to detail the basis of the NPR

Proposed Solution

Chart 4-1:

- WAL DVOR/DME
- MCT DVOR/DME
- WHI NDB
- LPL NDB
- HAW NDB

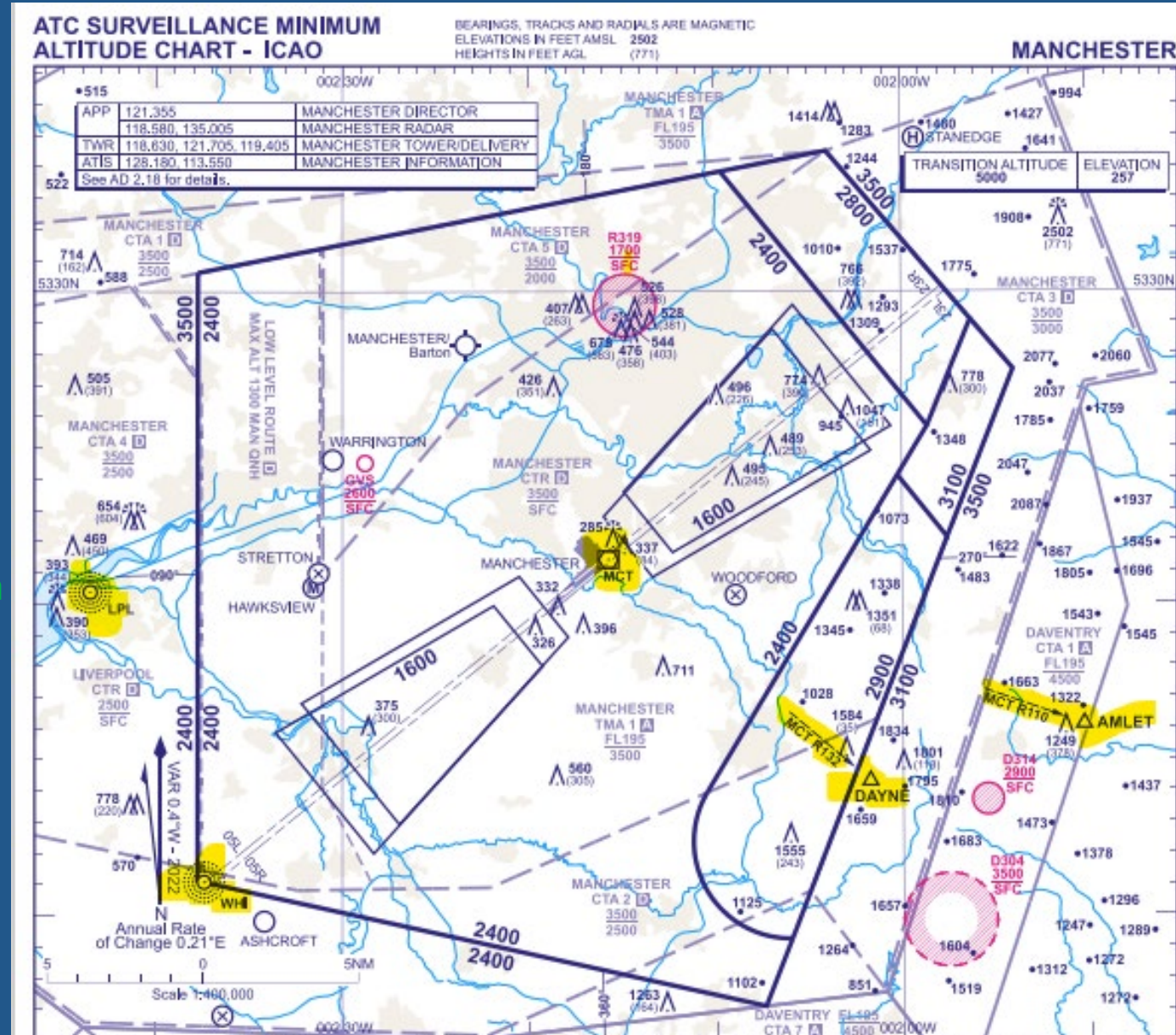
- Remove symbology
- Remove symbology
- Remove symbology
- Remove symbology
- Remove symbology



Proposed Solution

Chart 5-1:

- MCT DVOR/DME – Remove symbology
- LPL NDB – Remove symbology
- WHI NDB – Remove symbology
- MCT R132 & DAYNE – Remove annotation
- MCT R119 & AMLET – Remove annotation



Proposed Solution

SIDs:

- EKLAD 1R/1Y – RNAV Substitute
- KUXEM 1R/1Y – RNAV Substitute
- ASMIM 1S/1Z – RNAV Substitute
- LISTO 2S/2Z – RNAV Substitute
- LISTO 2R/2Y – RNAV Substitute
- POL 5R/1Y – RNAV Substitute
- POL 4S/1Z – RNAV Substitute
- SONEX 1R/1Y – RNAV Substitute
- DESIG 1S/1Z – RNAV Substitute
- SANBA 1R/1Y – RNAV Substitute

Proposed Solution

IAPs

- ILS/DME (I-MC)
- ILS/DME (MCT) 05R
- LOC/DME (I-MC)
- VOR/DME 05R

- ILS/DME (I-MC)
- ILS/DME (MCT) 05L
- LOC/DME (I-MM)
- VOR/DME 05L

- ILS/DME (I-NN)
- ILS/DME (MCT) 23R
- LOC/DME (I-NN)
- VOR/DME 23R

- VOR/DME 23L

- RNAV Substitute IAP element
- Remove procedure
- RNAV Substitute IAP element
- Remove procedure

- RNAV Substitute IAP element
- Remove procedure
- RNAV Substitute IAP element
- Remove procedure

- RNAV Substitute IAP element
- Remove procedure
- RNAV Substitute IAP element
- Remove procedure

- Remove procedure

Proposed engagement



We have already engaged aviation stakeholders through forums such as the Flight Operations Safety Committee (FLOPSC) and direct communications with based carriers. We propose to continue using similar mechanisms to inform and provide the opportunity for feedback.



We have already engaged non-aviation stakeholders through forums such as our Consultative Committee and meetings with Town and Parish Councillors. We propose to continue using similar mechanisms to inform and assure.

CAP1781 removing dependency on DVORs and DMES

- ✓ Impact Assessment (IA) submitted June 2023; feedback received October, revised IA to be submitted later this month (2023).
- ✓ Unused MONTY SID removal in AIRAC 13.
- ✓ RNAV Substitution is time-limited.
- ✓ 5-year periodic review of Initial App.
- ✓ Procedures like the

Map of UK ground based navigational aids

- DVORs staying
- DVORs to be decommissioned
- NDBs to be decommissioned

Works to remove dependency on DVORs and DMES

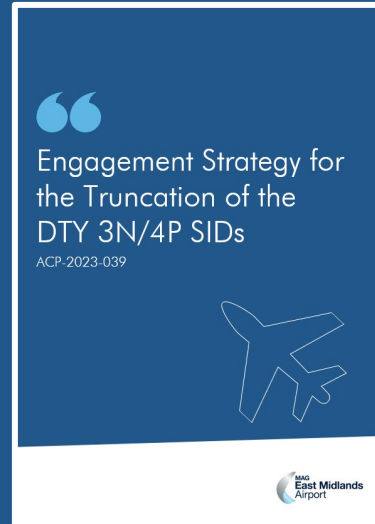
- ✓ MAN has dependencies on MCT DVOR and DME and references to the Trent DVOR.
- ✓ The no longer required MONTY SIDs will be removed from the UK AIP summer 2023.
- ✓ An impact Assessment is with the CAA for their consideration.
- ✓ Plan to RNAV Substitute is with the CAA for their consideration.
- ✓ VOR/DME and ILS/DME equipped aircraft.
- ✓ RNP approaches to 05L/05R (MCT) approach.
- ✓ RNP approaches to 05L/05R/23R approach.
- ✓ Plan to

Manchester Airport Future Airspace and work to remove dependency on MCT/TNT DVORs & MCT DME
Flight Operations Safety Committee (FLOPSC) 9th November 2023

Manchester Airport Future Airspace and work to remove dependency on MCT/TNT DVORs & MCT DME
Technical Advisory Group (TAG) to the Manchester Airport Consultative Committee (MACC)
Friday 9th June 2023

Future Airspace Consultation Manager

Proposed engagement



- We will submit an engagement strategy that summarises our proposed/completed engagement.
- We will summarise our completed engagement in the submitted documentation. We will detail feedback from stakeholders to show support or otherwise of our proposal.
- We need to establish airlines can fly RNAV substitutions.
 - Our Flight Equipage survey has revealed the technical capabilities and navigation systems used by carriers using MAN.
 - We currently have data on airlines flying 95% of the 2024 summer schedule. We are working hard to improve that.
- We will follow up the presentations made to Flight Operators Safety Group (FLOPSC) with an e-mail to operators with the details of the RNAV substitution. Mail will be sent in August giving operators 28 days to reply (total of more than eleven-months since first raised at FLOPSC).
- Our colleagues in the Flight Evaluation Team will support our efforts within their own communications and meetings with operators using Manchester Airport.

2024														
Departures					Arrivals									
Aircraft Type / variant	FIG Manufacturer	RNAV 1 (DME/DME)	RNAV 1 (SRS)	RNP1	RNP1 + Rf sums	RNAV Holding	Conventional procedures only	Aircraft Type / variant	FIG Manufacturer	RNAV	LPV (GBAS)	LPV/VNAV (Baro/VNAV)	GBAS	Conventional procedures only
1 B737-800V	Smiths (GE)	Yes	Yes	Yes	Yes	Yes	No	1 B737-800V	Smiths (GE)	Yes	No	Yes	Mixed Capability	No
2 B737-MAXB	Smiths (GE)	Yes	Yes	Yes	Yes	Yes	No	2 B737-MAXB	Smiths (GE)	Yes	No	Yes	No	No
3 B737-700V	Smiths (GE)	Yes	Yes	Yes	Yes	Yes	No	3 B737-700V	Smiths (GE)	Yes	No	Yes	No	No
4 A320-200	Honeywell	Yes	Yes	Yes	Yes	Yes	No	4 A320-200	Honeywell	Yes	No	Yes	No	No
5 A320-200	Thales	Yes	Yes	Yes	Yes	Yes	No	5 A320-200	Thales	Yes	No	Yes	No	No

2028														
Departures					Arrivals									
Aircraft Type / variant	FIG Manufacturer	RNAV 1 (DME/DME)	RNAV 1 (SRS)	RNP1	RNP1 + Rf sums	RNAV Holding	Conventional procedures only	Aircraft Type / variant	FIG Manufacturer	RNAV	LPV (GBAS)	LPV/VNAV (Baro/VNAV)	GBAS	Conventional procedures only
1 B737-800V	Smiths (GE)	Yes	Yes	Yes	Yes	Yes	No	1 B737-800V	Smiths (GE)	Yes	Undecided	Yes	Mixed Capability	No
2 B737-MAXB	Smiths (GE)	Yes	Yes	Yes	Yes	Yes	No	2 B737-MAXB	Smiths (GE)	Yes	Undecided	Yes	No	No
3 B737-700V	Smiths (GE)	Yes	Yes	Yes	Yes	Yes	No	3 B737-700V	Smiths (GE)	Yes	Undecided	Yes	No	No
4 A320-200	Honeywell	Yes	Yes	Yes	Yes	Yes	No	4 A320-200	Honeywell	Yes	Undecided	Yes	No	No
5 A320-200	Thales	Yes	Yes	Yes	Yes	Yes	No	5 A320-200	Thales	Yes	Undecided	Yes	No	No
6 B737-MAX10	Smiths (GE)	Yes	Yes	Yes	Yes	Yes	No	6 B737-MAX10	Smiths (GE)	Yes	Undecided	Yes	Yes	No

Additional information	
If any of your fleet has reliance on conventional procedures only please provide an indication of how long this dependency is planned to remain before a transition to RNAV only.	n/a
If yes, what are these dependencies? (e.g. ...)	n/a
Could you please tell us your Navigation Database Coding provider? (e.g. LIDO, Jeppesen etc.)	Thales (B737/A320) / Honeywell (A320)
Please add any further comments that you may have on this survey	n/a
Assuming ISA + 10 conditions, could the worst performing aircraft that operates from Manchester fly a	
✓ 6%? Yes @ MTOW	
✓ 8%? Yes @ MTOW	
✓ 10%? Dependant on Take-off weight - Not achievable at MTOW	
Comments:	n/a
Airline Name/Company	
Name	
Position	
Email Address	

Propose Level Change

CAP1616 V5 (2024 onwards)

Level 1	Change with the potential for a high impact on stakeholders.
Level 2	Change with the potential for a medium impact on stakeholders.
Level 3	Change with the potential for a low impact on stakeholders.

ACP-2024-007

RNAV Substitution of Eligible Procedures

- Initial Approach element of the current published approach procedures will be separated out and become IAPs as part of the 5-yearly Periodic Review and RNAV Substituted.
- Aircraft are routinely vectored, under radar control, to make an ILS approach to the duty runway. THIS WILL CONTINUE
- Aircraft fly RNAV Overlay versions of the SIDs and most have done for 10 years+. THIS WILL CONTINUE
- No change to any lateral track or vertical profile flown as a result of this ACP
- No change to this ACP as a result of the approval/ implementation of ACP-2024-002
- The MCT DVOR will be withdrawn 1st January 2026

Habitat Regulations Assessment (HRA)

CAP1616f paragraph 3.68 states 'a Habitat Regulations Assessment is required for airspace change proposals which are likely to have a significant effect – either or alone or in combination with other plans or projects – on European sites.' CAP1616i Paragraph 2.15 refers the change sponsor of a Level 3 change to follow the requirements detailed in CAP1616h. CAP1616h B12 requires the change sponsor to complete the habitats regulations assessment early screening criteria form as contained in CAP1616i.

		Answer
Q1.	Are there any changes to air traffic patterns or numbers of movements expected below 3,000ft due to the airspace change proposal? <i>If the answer to Q1 is 'no' then habitats regulations assessment is no longer required.</i> <i>If the answer to Q1 is 'yes', then proceed to Q2 below.</i>	No
Q2A.	Are there any European sites within a radius of 18KM of each runway end?	n/a <i>see answer to Q1 above</i>
Q2B.	Are any European sites identified in Q2A overflown (i.e. plane passing directly overhead or within 2,655ft of the boundary of a European site at 3,000ft or below) by proposed flight routes? ¹ <i>If the answer to Q2A and Q2B are both 'no', then habitats regulations assessment is no longer required.</i> <i>If the answer to Q2A or Q2B is 'yes', then proceed to Q3 below</i>	
Q3A	Will the airspace change proposal reduce the number of movements overflying one or more European sites, while not increasing them over another? ²	n/a <i>see answer to Q1 above</i>
Q3B	Will the airspace change proposal increase the altitude of aircraft overflying one or more European sites, whilst not decreasing altitude over another? <i>If the answer to Q3A and Q3B are both 'yes', then habitats regulations assessment is no longer required.</i> <i>If the answer to Q3A or Q3B is 'no' then secondary screening will be required.</i>	

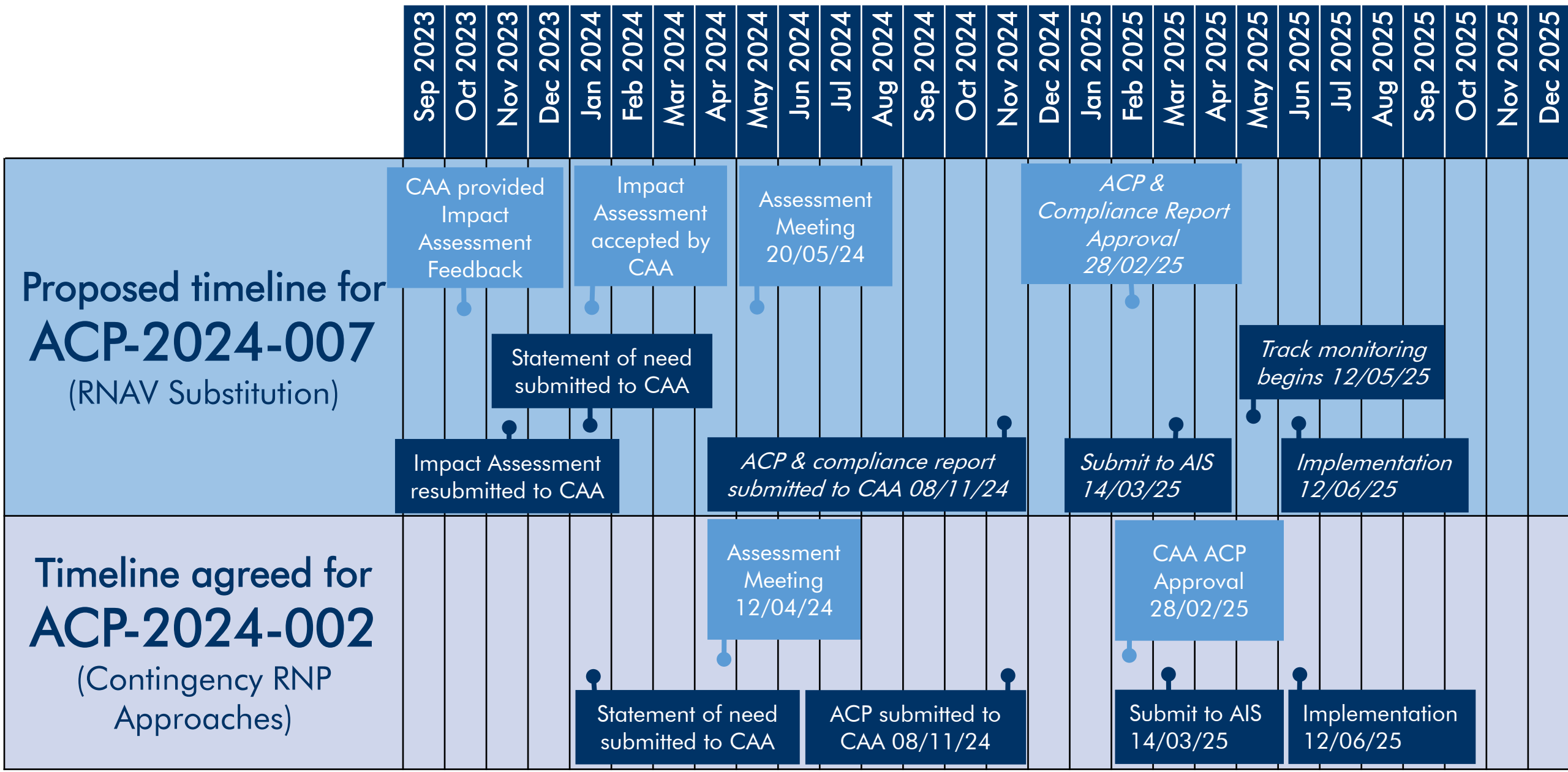
¹CAP1498 provides the CAA's definition of overflight as it relates to airspace regulation. Adopting this definition, for a 48.5° elevation angle threshold, overflight would be experienced from any aircraft flying at a height of 3,000ft and within a lateral distance of approximately 2,655ft from the boundary of a European site.

²In the event that more than one European site is overflown, consideration **must** be given to whether or not changes are positive, remain the same or are negative at each individual location. A habitats regulations assessment can only be screened out where there is no change or where there is benefit to all relevant European sites.

ACP-2024-007 Safety & Compliance work (CAP1781b)

- In accordance with CAP1781b.
- One or more Hazard ID meetings.
- Written up in accordance with the ANSPs SMS.
- Meet the requirements (goals & sub-goals) required by CAB1781b.
- Radar monitoring will commence one month before 'O' date and continue for 12 months thereafter (routine ANOMS capture).

RNAV Substitution Timeline (for discussion)



Proposed timeline for
ACP-2024-007
(RNAV Substitution)

Timeline agreed for
ACP-2024-002
(Contingency RNP Approaches)

CAA provided
Impact
Assessment
Feedback

Impact
Assessment
accepted by
CAA

Assessment
Meeting
20/05/24

*ACP &
Compliance Report
Approval
28/02/25*

Statement of need
submitted to CAA

*Track monitoring
begins 12/05/25*

Impact Assessment
resubmitted to CAA

*ACP & compliance report
submitted to CAA 08/11/24*

*Submit to AIS
14/03/25*

*Implementation
12/06/25*

Assessment
Meeting
12/04/24

CAA ACP
Approval
28/02/25

Statement of need
submitted to CAA

ACP submitted to
CAA 08/11/24

Submit to AIS
14/03/25

Implementation
12/06/25

Next Steps

&

AOB

Next Steps (MAG)

- Draft Assessment Meeting Minutes
- Publish Assessment Meeting Material
- Begin engagement and compilation of evidence for submission

Next Steps (CAA)

- Review Assessment Meeting Minutes

Next Steps (MAG)

- Update Portal

AOB