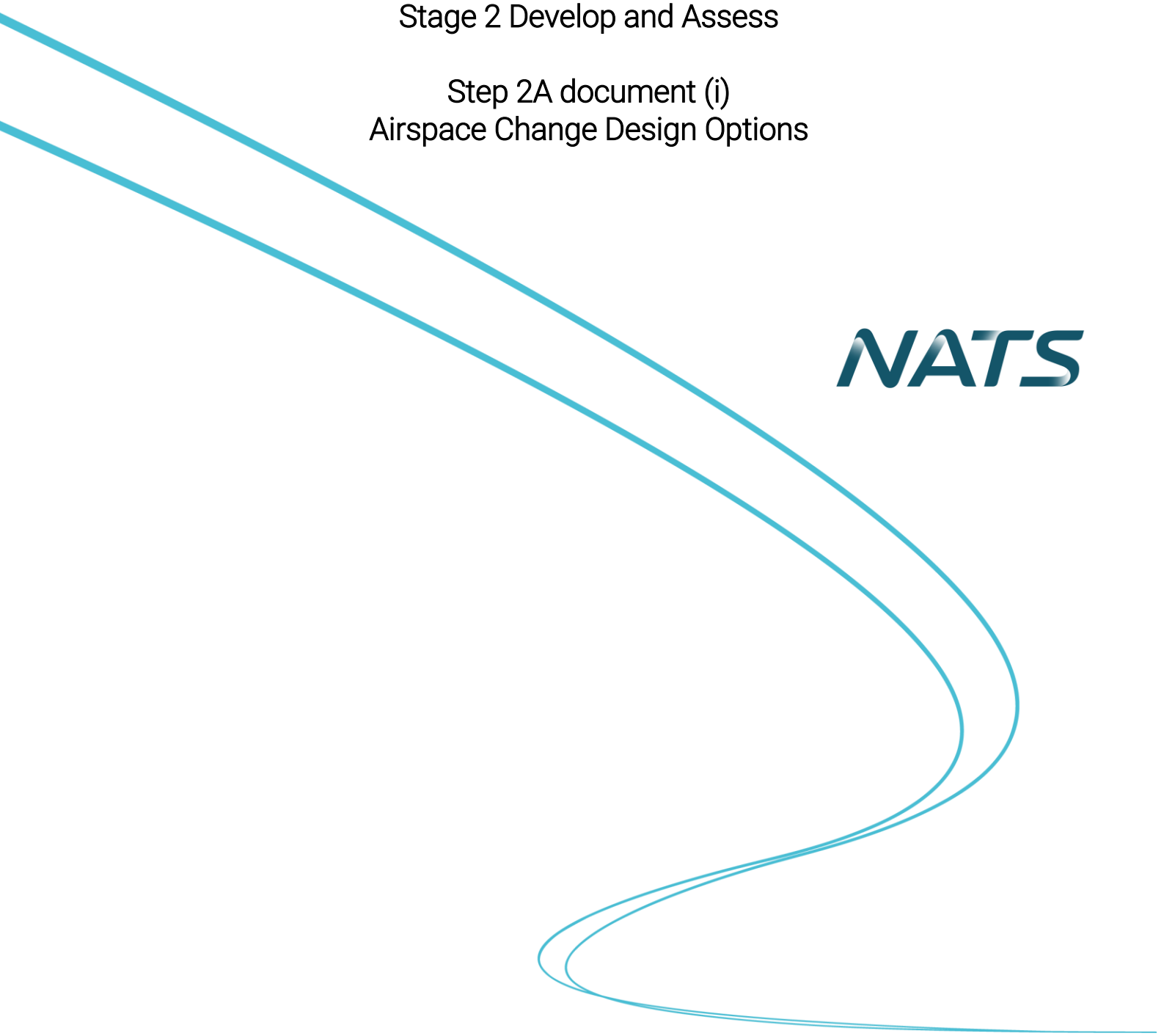
Swanwick Airspace Improvement Programme
Airspace Development 5
LAC West – ATS Route Connectivity Improvements

SAIP AD5 LAC West Connectivity

Gateway documentation:
Stage 2 Develop and Assess

Step 2A document (i)
Airspace Change Design Options



Roles

Action	Role	Date
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Issue	Month/Year	Changes this issue
1.0	16 Nov	Published to the CAA online portal
2.0	08 Jan	Updated and resubmitted, following additional clarifications from SARG

Contents

1. Introduction

1.1 This document forms part of the document set required in accordance with the requirements of the CAP1616 airspace change process.

1.2 This document aims to provide adequate evidence to satisfy
Stage 2 Develop and Assess Gateway, Step 2A Airspace Change Design Options

2. Options development – brief history

2.1 This SAIP AD5 proposal stems from ongoing work by NATS which focuses on the following three main areas of airspace development:

- Establish CAS and ATS Routes for arrivals to, and departures from EGBB via the MOSUN area. This will allow a more predictable ATS route connection for EGBB traffic to and from the South-West.
- A unidirectional tactical offload route(s) for traffic inbound to EGLL from S23/ TC SW into S5/ TC MIDS, to offload traffic from the OCK (Ockham) Hold to the BNN (Bovingdon) Hold, when the OCK hold is above capacity.
- Establish a number of ATS Routes in the West End Sector Group which will mimic common tactical behaviour, some of this will act as a precursor to Free Route Airspace (FRA) by allowing predicted routings that FRA will enable. They will provide more flight planning options for airlines and enable the reduction of fuel uplift/ burn and associated emissions.

2.2 The following sections of this document refer to Baseline (no change) for the EGBB and EGLL areas of work; EGBB concept options; EGLL concept options, ATS routes and TRA boundary amendment.

2.3 NATS may take the opportunity to provide administrative updates to other airspace, route or IFP elements in the region as part of this proposal.

3. Stakeholder Engagement

Two design workshops were held, summarised below. In each, example design concepts for the three main areas of work were illustrated and discussed.

3.1 A NATS-MoD-General Aviation design workshop was held on 27th September 2018 at NATS' Brettenham House office, central London.
Participants:
NATS ATC Lead and Airspace Change Specialists
MoD Defence Airspace and Air Traffic Management (DAATM)
MoD RAF Brize Norton
MoD RAF(U) Swanwick
General Aviation Alliance (via phone and online), representing a partnership of organisations representing UK General Aviation (GA), and Sports and Recreational Aviation interests (S&RA)
Airspace4All (formerly FASVIG), whose mission is to work in partnership with other aviation stakeholders to explore innovative solutions to create a sustainable and equitable UK air traffic environment.
Notes from this meeting were sent out and agreed afterwards.
Subsequently NATS made direct contact via email and telephone, to discuss particular elements.
RAF(U) Swanwick were also invited to participate in development simulations (5th, 15th November 2018).

3.2 A NATS-Airlines-Airports design workshop was held on 16th October 2018 at the Hyatt Hotel, Heathrow.
Participants:
NATS ATC Leads, Airspace Change Specialists, Analytics Specialist
British Airways Nav/ATM Manager
Jet2 Air Traffic Services Manager
StobartAir Base Captain (via phone and online)
FlyBe Flight Planning and FlyBe ATC Manager (via phone and online)
Virgin Atlantic Senior Nav Services Officer (via phone and online)
Ryanair Nav Services Officer, and Ryanair Flight Ops Tech Manager (via phone and online)

Birmingham Airport Ltd (BAL) ATC Watch Manager, and BAL Head of Sustainability
Heathrow Airport Ltd (HAL) Airspace Performance Manager
Notes from this meeting were sent out and agreed afterwards.
Subsequently NATS made direct contact via email and/or telephone, to discuss particular elements.
BAL ATC attended and observed development simulations (5th and 15th November 2018) and provided additional feedback. NATS has also attended and observed, the reciprocal BAL ATC simulation on 16thNovember 2018.

3.3 Additionally, the Irish Aviation Authority (IAA) was briefed on SAIP AD5 early in 2018 and remains an interested ANSP stakeholder.

3.4 Relevant elements of this proposal were presented and discussed at the North American-European (NAM/EUR) flow management taskforce, in Frankfurt on 23rd October 2018. Attendees included north Atlantic aircraft operators, Eurocontrol Network Management, and the IAA.

3.5 This section demonstrated two-way engagement with appropriate stakeholders. Engagement continues via direct email or phone contact.

4. Baseline (do nothing) description

The following pages describe the baseline (do nothing) scenarios, individually, for relevant Birmingham traffic flows and Heathrow traffic flows.

4.1 EGBB current airspace diagram

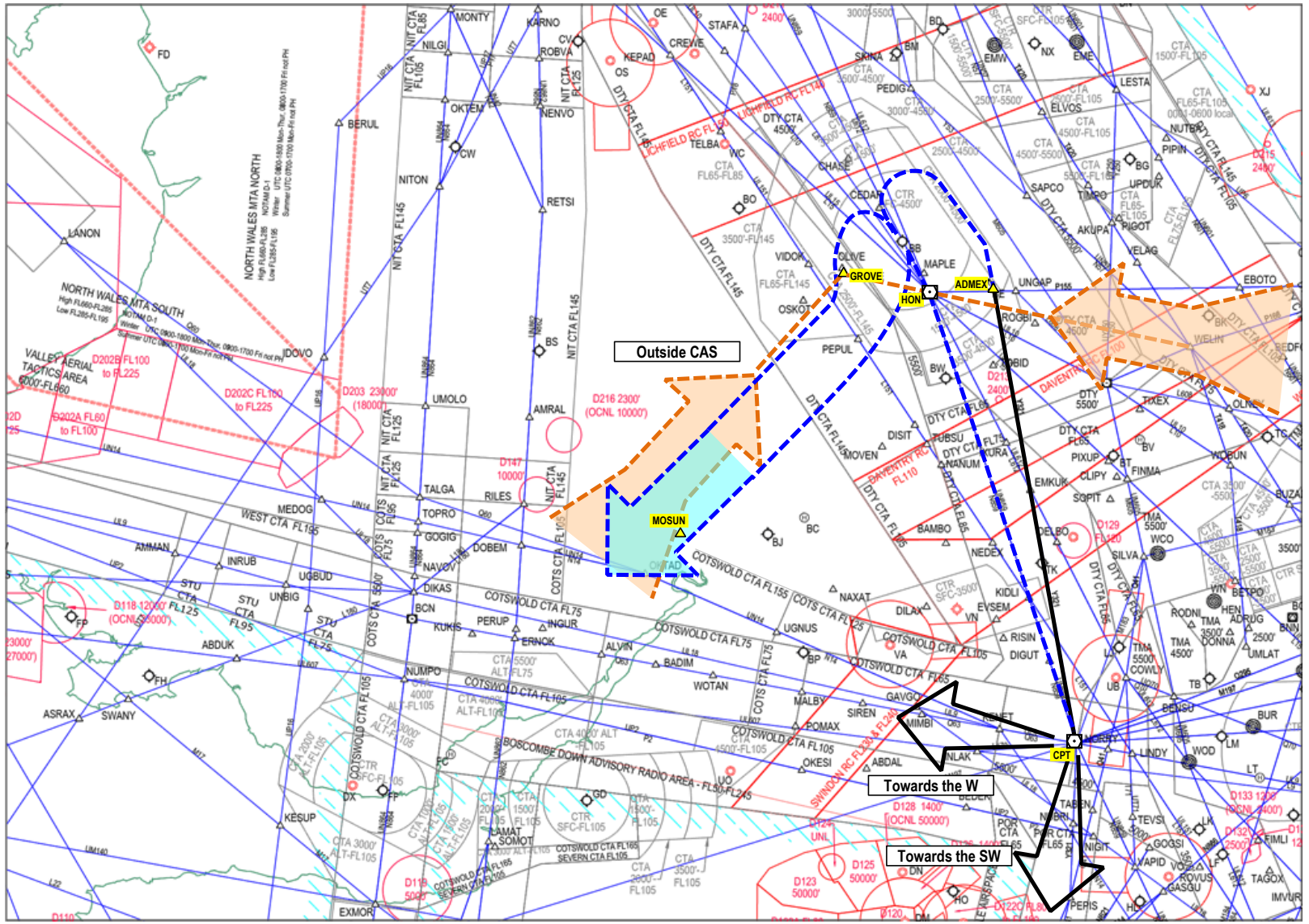


Figure 1 Current Birmingham traffic flows relevant to this proposal

4.1.1 Figure 1 on Page 5 shows some of the current EGBB arrival and departure routes.

4.1.2 The traffic flows relevant to this proposal are the EGBB arrivals and departures which route via MOSUN. Currently this traffic leaves CAS when transiting between the Birmingham area and the Cotswold CTAs as per the times and conditions in the AIP extract below (AD 2.EGBB, section 2.22 para 2):

> Birmingham-MOSUN Procedures
>
> Aircraft joining or leaving MOSUN requesting FL 170 or above, the Birmingham-MOSUN Procedure is only available between the following times:
>
> Mon-Fri 1700-1000 (1600-0900); Fri 1700 (1600) - Mon 1000 (0900). For turboprop aircraft joining or leaving at MOSUN FL 160 or below the Birmingham-MOSUN Procedure is available without restriction.

4.1.3 There are currently limited flight-planning options to access the Midlands area, to and from the west and southwest (black arrows). There are also often discrepancies between what is flight planned versus what is actually flown, as a tactical short cut is often given. However aircraft must fuel for the original and longer flight planned route; thus carrying more fuel than actually required.

4.1.4 Feedback from EGBB aircraft operators is that the current airspace structure does not provide a predictable controlled environment for EGBB traffic which routes via MOSUN.

4.2 EGLL current airspace diagram

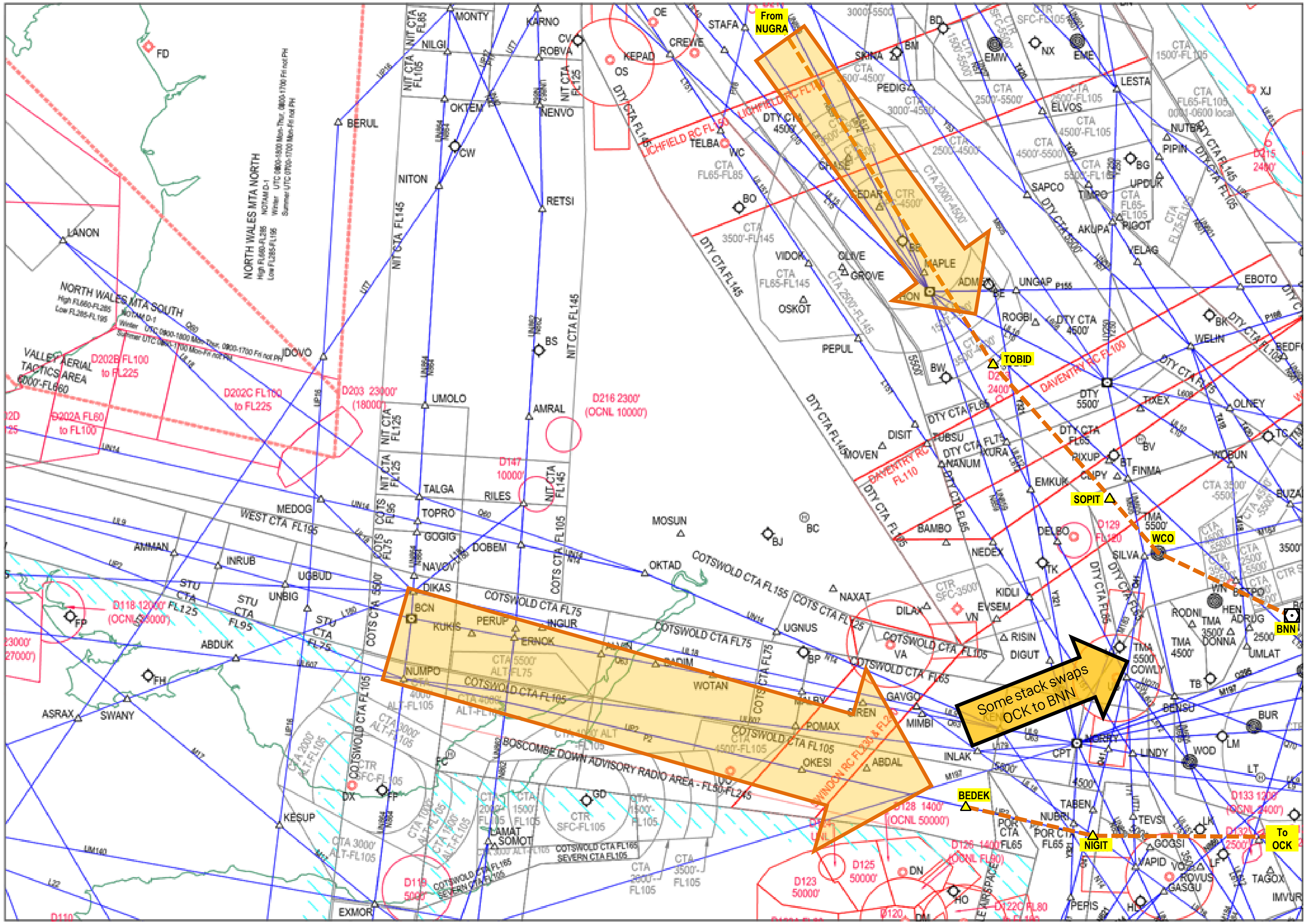


Figure 2 Current Heathrow arrival flows relevant to this proposal

4.2.1 Figure 2 on Page 7 shows the two applicable and current high-level inbound EGLL routes, for traffic which has left Irish airspace. The northern route brings transatlantic flights across the Irish Sea towards the Manchester area. The southern route brings arrivals from southern Eire across southern Wales towards the London area.

4.2.2 Currently if the EGLL OCK (Ockham) stack is full, arrivals are routed from OCK to BNN (Bovingdon), often at late-notice – illustrated by the dark orange arrow. This can create a highly complex situation within an already busy holding environment; which has, on occasion, led to extreme traffic loading and complexity in that region resulting in a high increase in ATC and cockpit workload.

4.2.3 The flow from the south is generally used more often than the flow from the north, following on from the implementation of Free Route Airspace by the Irish FIR in 2009. This change in the proportion of traffic has added to the number of EGLL stack swaps from the OCK to the BNN hold.

4.2.4 In 2017 c.2,600 EGLL arrivals had to be swapped from their planned OCK arrival, to BNN. The busiest individual day that year was Thursday 22nd June, with 36 swaps from OCK to BNN.

4.2.5 The aircraft operators' preference of OCK and BNN routes for EGLL arrivals is also dependent on the transatlantic weather system and the associated North Atlantic Tracks.

5. EGBB Concept Overview

The two main concept options discussed in this section aim to provide more predictable flight planning options for EGBB arrivals and departures. They are similar to the existing flows, both aiming to avoid low level changes below 7,000ft and both require new volumes of CAS.
The concept options have been designed to fit into the current EGBB operation and alongside Birmingham Airport Ltd (BAL)'s proposed ACP for the Runway 33 UMLUX SID (towards MOSUN, currently in progress separately from this proposal). EGBB's current published MOSUN departure also aligns with either of these concept options – there is no dependency on the EGBB SID ACP being approved.
To avoid doubt, these concepts are for a combination of ATS routes and a new Birmingham STAR to the existing GROVE hold.
We have engaged on indicative designs with relevant stakeholders (see Section 3), which remain open to change. The design work has presented limited scope for multiple route design options, with the placement of routes restricting where volumes of CAS would be required.

During engagement with stakeholders, as mentioned in Section 3, a suggestion was made to consider a Class E + TMZ airspace classification. This has not been considered within the design options as this would require significant additional training for Swanwick and BAATL controllers. Additionally NATS iFACTs toolset, used by AC controllers, was not designed to identify conflictions between IFR and VFR traffic as it is a trajectory based tool based on flight plan data. This would likely cause significant problems for controllers when interpreting the separation monitor.

However, there is still scope for different design concept options. Each of the two main concept options described below can be split into additional sub-options based on the following criteria:

- Airspace classifications:
  - Class A
  - Class C
  - Class D
  - Class E

- Times of availability:
  - Routes/airspace established H24/365, with appropriate clawback arrangements or consideration of planned special events
  - Routes/airspace established evenings/overnights/mornings, 7 days a week, with appropriate clawback arrangements or consideration of planned special events
  - Routes/airspace established evenings/overnights/mornings on weekdays, and H24 weekends, with appropriate clawback arrangements or consideration of planned special events

Additionally, a third EGBB option is included to illustrate an alternate concept.

5.1 EGBB-1 Concept Option

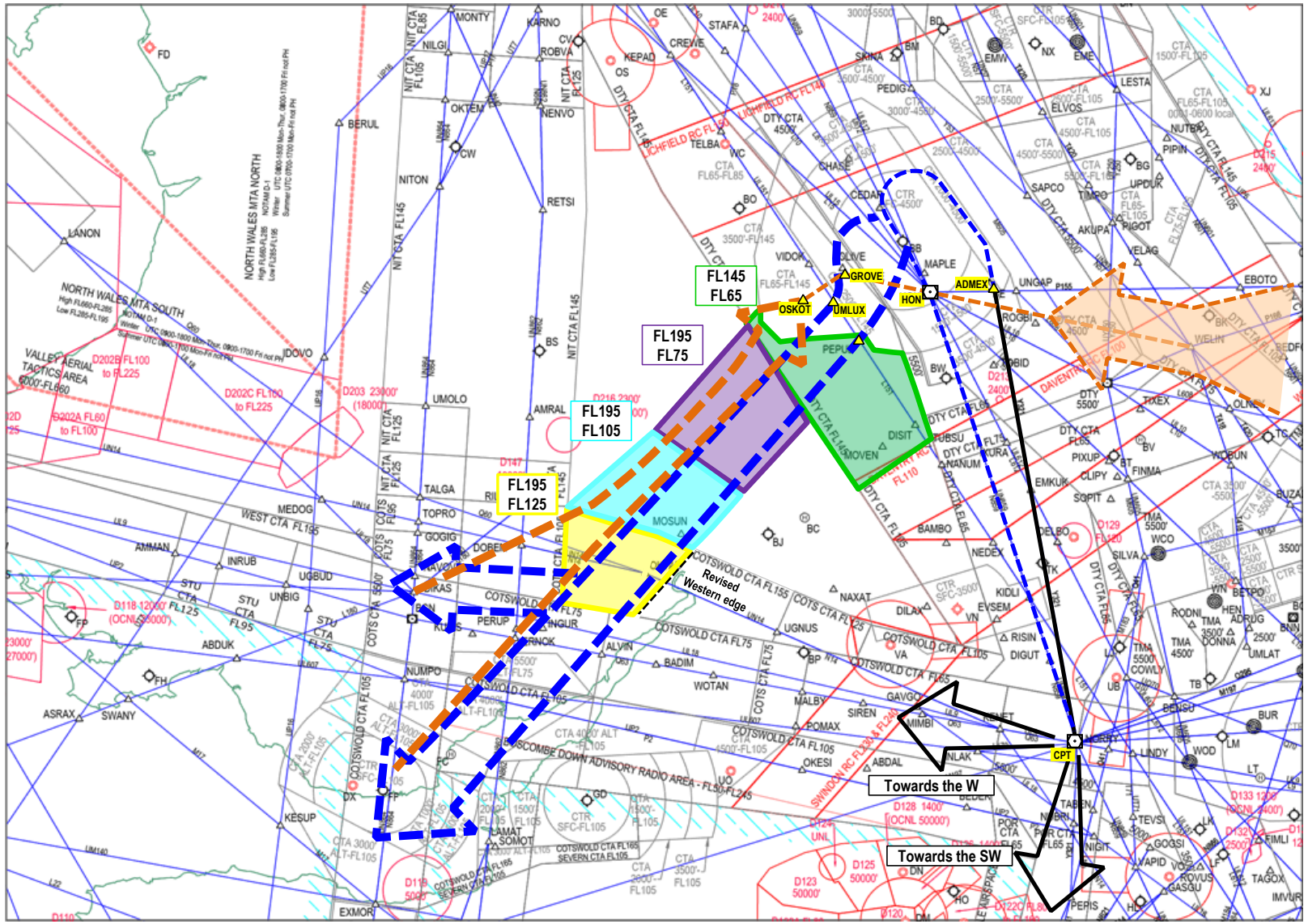


Figure 3 Airspace and Route Design Concept Option EGBB-1

5.1.1 This design concept contains indicative routes for EGBB arrivals (shown in orange) and departures (shown in blue) which are contained within CAS. An appropriate containment buffer would be applied to the north and south, cognisant of sector boundaries and CAS containment policy.

5.1.2 This option aims to minimise the space between opposite-direction ATS routes to/from Birmingham. There is an assumed minimum separation of 7nm between opposite direction ATS routes in a 5nm radar separation environment (in accordance with CAP1385). This design requires a 3nm CAS and Sector Boundary buffer, for the northern edge, and a 2nm CAS buffer for the southern edge. The overall CAS corridor width of this two-route structure would therefore be 12nm (except the slightly wider part near RILES where routes converge/diverge).

5.1.3 This option proposes four separate volumes of CAS with varying base levels in accordance with predicted climb and descent profiles.

5.1.4 Within the northern volume of CAS (shown in green), it is logical to expect this to reflect today's division of responsibility. At lower levels, Birmingham radar would manage their arrivals and departures within the tactical vectoring area above 7,000ft. At higher levels, London Terminal Control Midlands (TC MID) would manage the network interface with Birmingham.

There will not be a change in traffic patterns below 7,000ft. The EGBB SIDs and MOSUN NSDs all currently go to 6,000ft, as published in the AIP, and are then all climbed to FL80 by Birmingham radar, before being transferred to the appropriate sector. Our proposal will replicate the current MOSUN NSD with a PEPUL NSD which will be operated exactly as today, and the existing SIDs will also continue to be operated in the same way. The only change will be that traffic will be contained within CAS and be worked by a combination of Birmingham Radar and Swanwick Civil controller, rather than Birmingham Radar and Swanwick Military/ Western Radar. Therefore there will be no lateral or vertical change to traffic below 7,000ft.

5.1.5 Design Concept Option EGBB-1 defines the route structure and the lateral and vertical extent of CAS but does not become a describable option until airspace classifications and times of availability are assigned. These are numbered and described as follows:

- Classifications:
    - EGBB-1A: Class A airspace
    - EGBB-1B: Class C airspace
    - EGBB-1C: Class D airspace
    - EGBB-1D: Class E airspace

- Times of availability: Routes/airspace established…
    - EGBB-1E: H24/365, with appropriate clawback arrangements or consideration of planned special events
    - EGBB-1F: Evenings/overnights/mornings, 7 days a week – disestablished during the day, with appropriate clawback arrangements or consideration of planned special events
    - EGBB-1G: Routes/airspace established evenings/overnights/mornings on weekdays, and H24 weekends, with appropriate clawback arrangements or consideration of planned special events

5.2 EGBB-2 Concept Option *(as per EGBB-1with a smaller CAS volume in the vicinity of Birmingham, coloured green)*

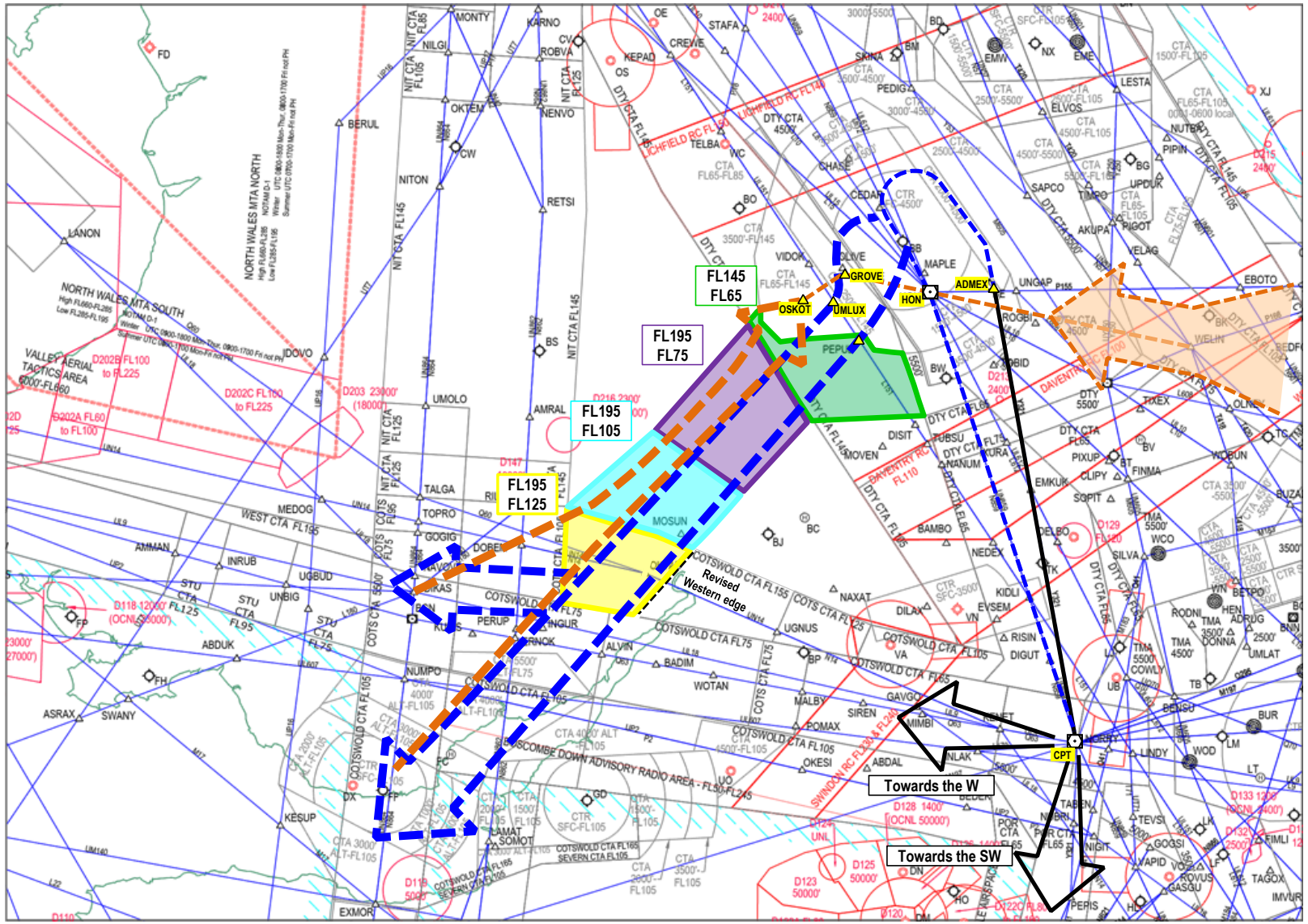


Figure 4 Airspace and Route Design Concept Option EGBB-2

5.2.1 This design concept option contains the same indicative routes as EGBB-2 above. All of the containment buffers and assumed separations are also the same, with the same 12nm CAS corridor width.

5.2.2 The northern green segment of CAS has been reduced in size, with the southern boundary moved further north. This reduces the amount of new CAS required (therefore reducing the potential impact on the GA community), however it reduces the flexibility for EGBB to tactically vector traffic.

5.2.3 Design Concept Option EGBB-2 defines the route structure and the lateral and vertical extent of CAS but does not become a describable option until airspace classifications and times of availability are assigned. These are numbered and described as follows:

- Classifications:
    - EGBB-2A: Class A airspace
    - EGBB-2B: Class C airspace
    - EGBB-2C: Class D airspace
    - EGBB-2D: Class E airspace

- Times of availability: Routes/airspace established…
    - EGBB-2-E: H24/365, with appropriate clawback arrangements or consideration of planned special events
    - EGBB-2-F: Evenings/overnights/mornings, 7 days a week – disestablished during the day, with appropriate clawback arrangements or consideration of planned special events
    - EGBB-2-G: Routes/airspace established evenings/overnights/mornings on weekdays, and H24 weekends, with appropriate clawback arrangements or consideration of planned special events

5.3 EGBB-3 Concept Option

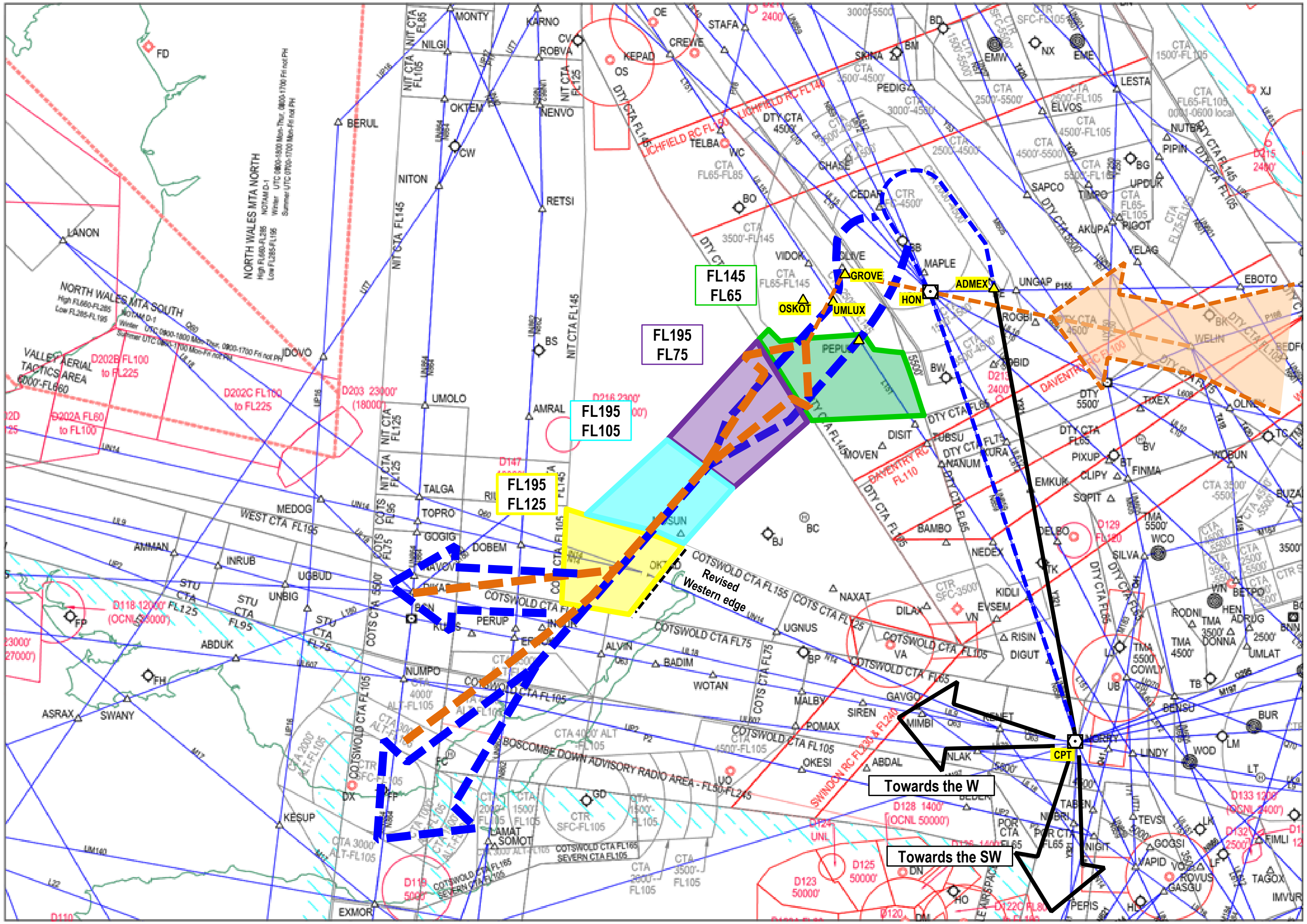


Figure 5 Airspace and Route Design Concept Option EGBB-3

5.3.1 This concept option was developed to illustrate a single, bi-directional ATS route.

5.3.2 The standard width of the CAS corridor would need to be 5nm either side of the route centreline, i.e. 10nm total width. This is the minimum allowable for tactical vectoring in a 5nm radar separation environment, presuming 2nm CAS containment.

5.3.3 Design Concept Option EGBB-3 defines the route structure and the lateral and vertical extent of CAS but does not become a describable option until airspace classifications and times of availability are assigned. These are numbered and described as follows:

- Classifications:
    - EGBB-3A: Class A airspace
    - EGBB-3B: Class C airspace
    - EGBB-3-C: Class D airspace
    - EGBB-3-D: Class E airspace

- Times of availability: Routes/airspace established…
    - EGBB-3-E: H24/365, with appropriate clawback arrangements or consideration of planned special events
    - EGBB-3-F: Evenings/overnights/mornings, 7 days a week – disestablished during the day, with appropriate clawback arrangements or consideration of planned special events
    - EGBB-3-G: Routes/airspace established evenings/overnights/mornings on weekdays, and H24 weekends, with appropriate clawback arrangements or consideration of planned special events

6. EGLL Concept Overview

The three concept options discussed in this section are focussed on a unidirectional tactical offload route(s) for EGLL inbounds, for when demand for the OCK hold is forecast to exceed available capacity. The objective of the EGLL offload concept is to provide more predictable options for the tactical balancing of flows, whilst reducing the overall operational complexity.

As mentioned above, if the OCK hold is currently at or near capacity, EGLL arrivals can be rerouted at late notice to the BNN hold; this can lead to a highly complex operation and can ultimately create an unsustainable increase in controller workload. This currently affects around 2,600 flights per annum. The proposed concept options aim to take Oceanic traffic inbound to EGLL from the typical S23 – TC SW - OCK flow, to a new S5 – TC MIDS – BNN flow. This would reduce the need for late tactical stack swaps, reducing ATC complexity and cockpit workload. This should result in far fewer late stack swaps under normal circumstances in the future.

We have engaged on indicative designs with relevant stakeholders (see Section 3), which are open to change. The design work has presented limited scope for multiple route design options, with the activation of the NWMTA affecting the availability of routes. The NWMTA dependency decrees that the offload routes cannot be used unless the NWMTA is inactive and therefore the timings must be aligned.

However, there is still some scope for different design concept options, i.e. where the routes can be placed and CAS requirements. This type of route does not currently exist in the region, so there is no similar item which could be used as a comparator. To avoid doubt, these proposed concepts are for a combination of ATS routes and a new Heathrow STAR to the existing BNN, which itself may include an en-route contingency hold.
Each of the three concept options described below can be split into additional sub-options based on the following criteria:

- Airspace classifications:
  - Class A
  - Class C
  - Class D
  - Class E

- Conditional route category:
  - CDR1 Always plannable during the times published in ENR3
  - CDR1/3 Always plannable during the times published in ENR3 and available tactically outside those hours, at ATC discretion
  - CDR3 Not flight plannable, only available tactically at ATC discretion

6.1 EGLL-1 Concept Option

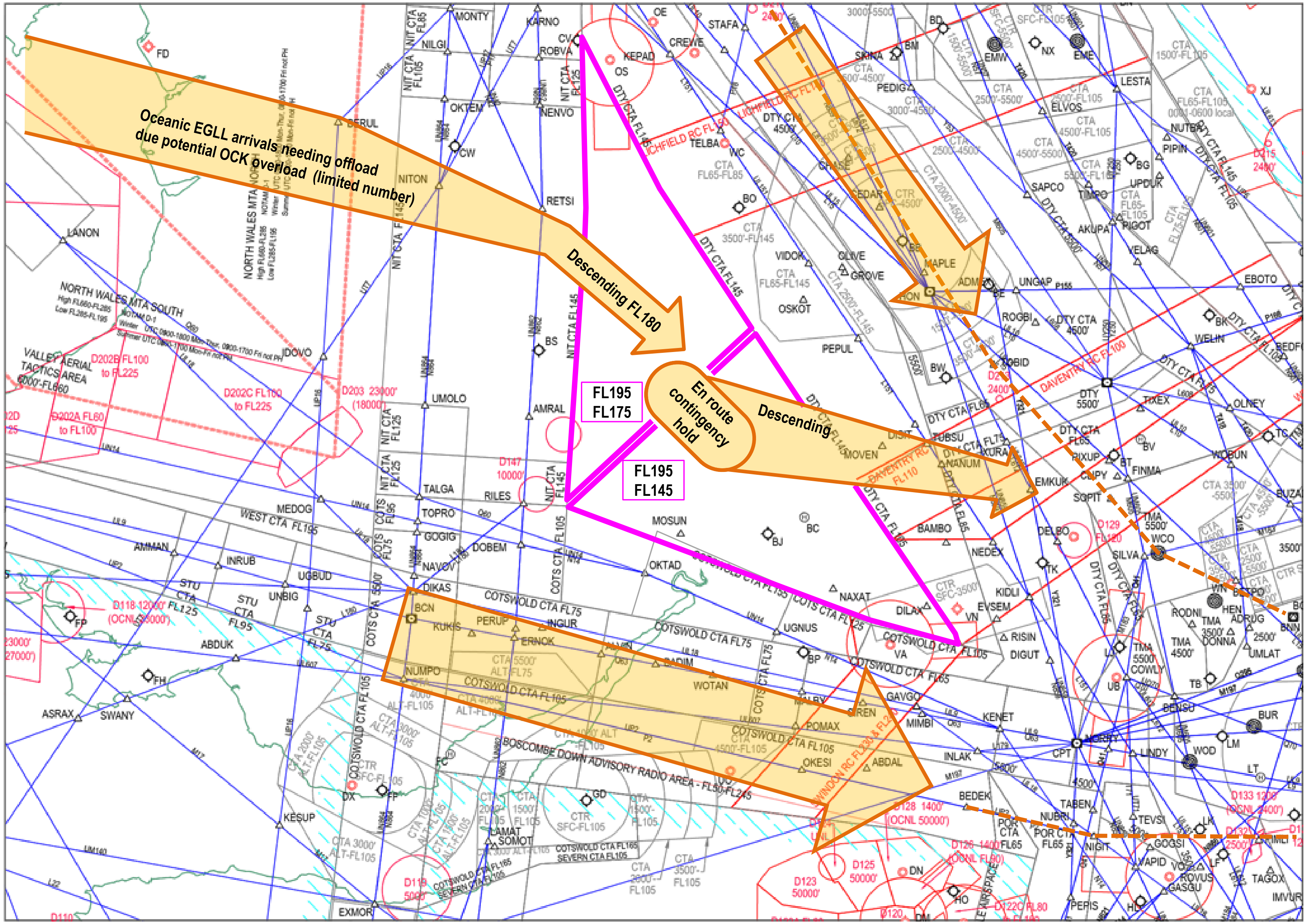


Figure 6 Airspace and Route Design Concept Option EGLL-1

6.1.1 This design concept contains a unidirectional tactical eastbound OCK offload route(s) for transatlantic EGLL arrivals. It proposes two separate volumes of CAS with different base levels.

6.1.2 This design concept would permit appropriate CAS containment for an en-route contingency hold which would align with the inbound route. This would be available for EGLL arrivals in non-standard situations, when arrivals are required to be held in the upper airspace sectors.

6.1.3 There would be no changes to Heathrow arrival flight paths below 7,000ft.

6.1.4 Design Concept Option EGLL-1 defines the route structure and the lateral and vertical extent of CAS but does not become a describable option until airspace classifications and conditional route categories are assigned. These are numbered and described as follows:

- Airspace classifications:
  - EGLL-1A: Class A
  - EGLL-1B: Class C
  - EGLL-1C: Class D
  - EGLL-1D: Class E

- Conditional route category:
  - EGLL-1E: CDR1 — Always plannable during the times published in ENR3
  - EGLL-1F: CDR1/3 — Always plannable during the times published in ENR3 and available tactically outside those hours, at ATC discretion
  - EGLL-1G: CDR3 — Not flight plannable, only available tactically at ATC discretion

6.2 EGLL-2 Concept Option *(as per EGLL-1 with no lateral CAS split)*

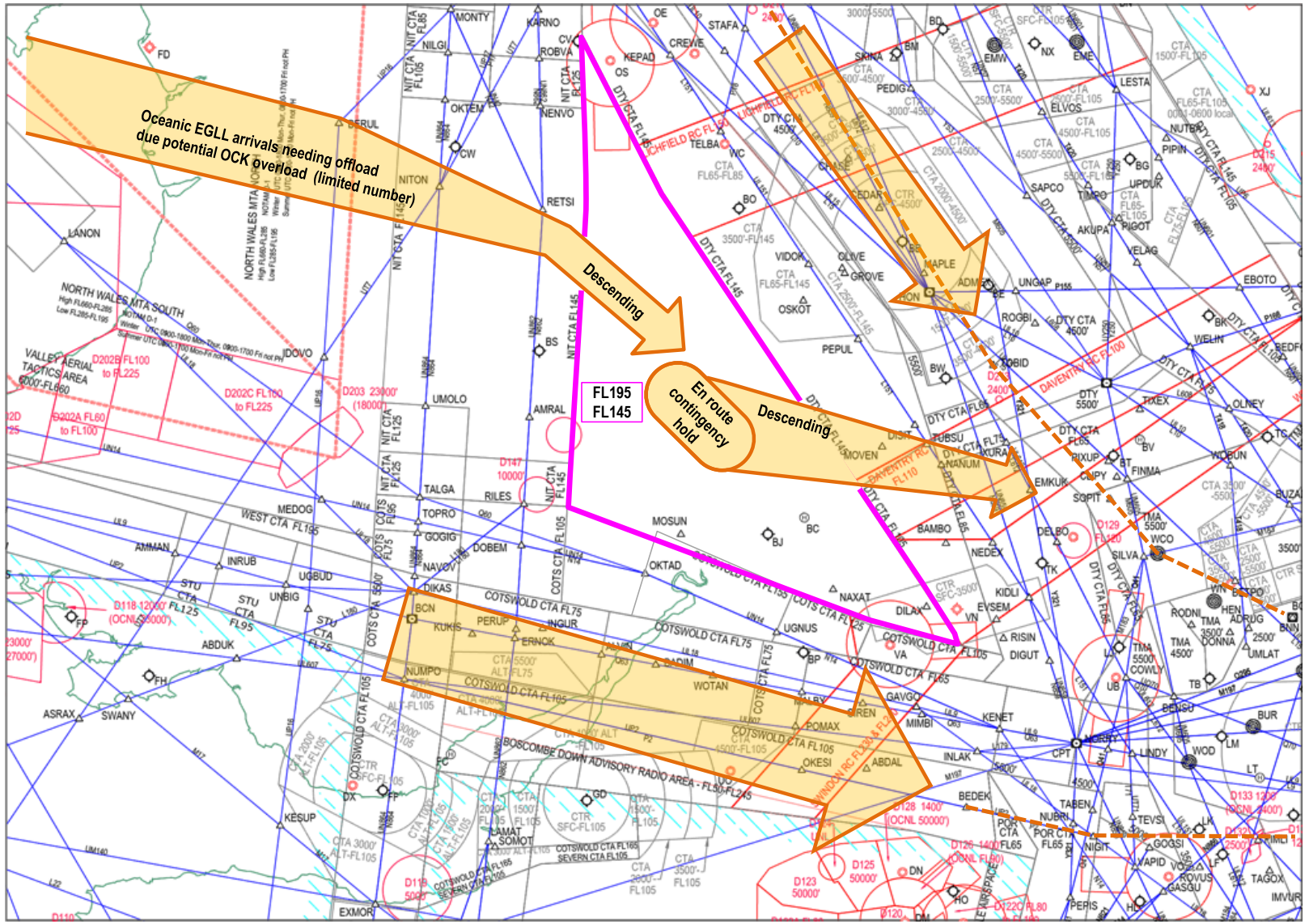


Figure 7 Airspace and Route Design Concept Option EGLL-2

6.2.1 This design concept contains the same uni-directional tactical eastbound OCK offload route(s) and the same contingency hold as EGLL-1. It proposes a single volume of CAS.

6.2.2 There would be no changes to Heathrow arrival flight paths below 7,000ft.

6.2.3 Design Concept Option EGLL-2 defines the route structure and the lateral and vertical extent of CAS but does not become a describable option until airspace classifications and conditional route categories are assigned. These are numbered and described as follows:

- Airspace classifications:
  - EGLL-2A: Class A
  - EGLL-2B: Class C
  - EGLL-2C: Class D
  - EGLL-2D: Class E

- Conditional route category:
  - EGLL-2E: CDR1 — Always plannable during the times published in ENR3
  - EGLL-2F: CDR1/3 — Always plannable during the times published in ENR3 and available tactically outside those hours, at ATC discretion
  - EGLL-2G: CDR3 — Not flight plannable, only available tactically at ATC discretion

6.3 EGLL-3 Concept Option

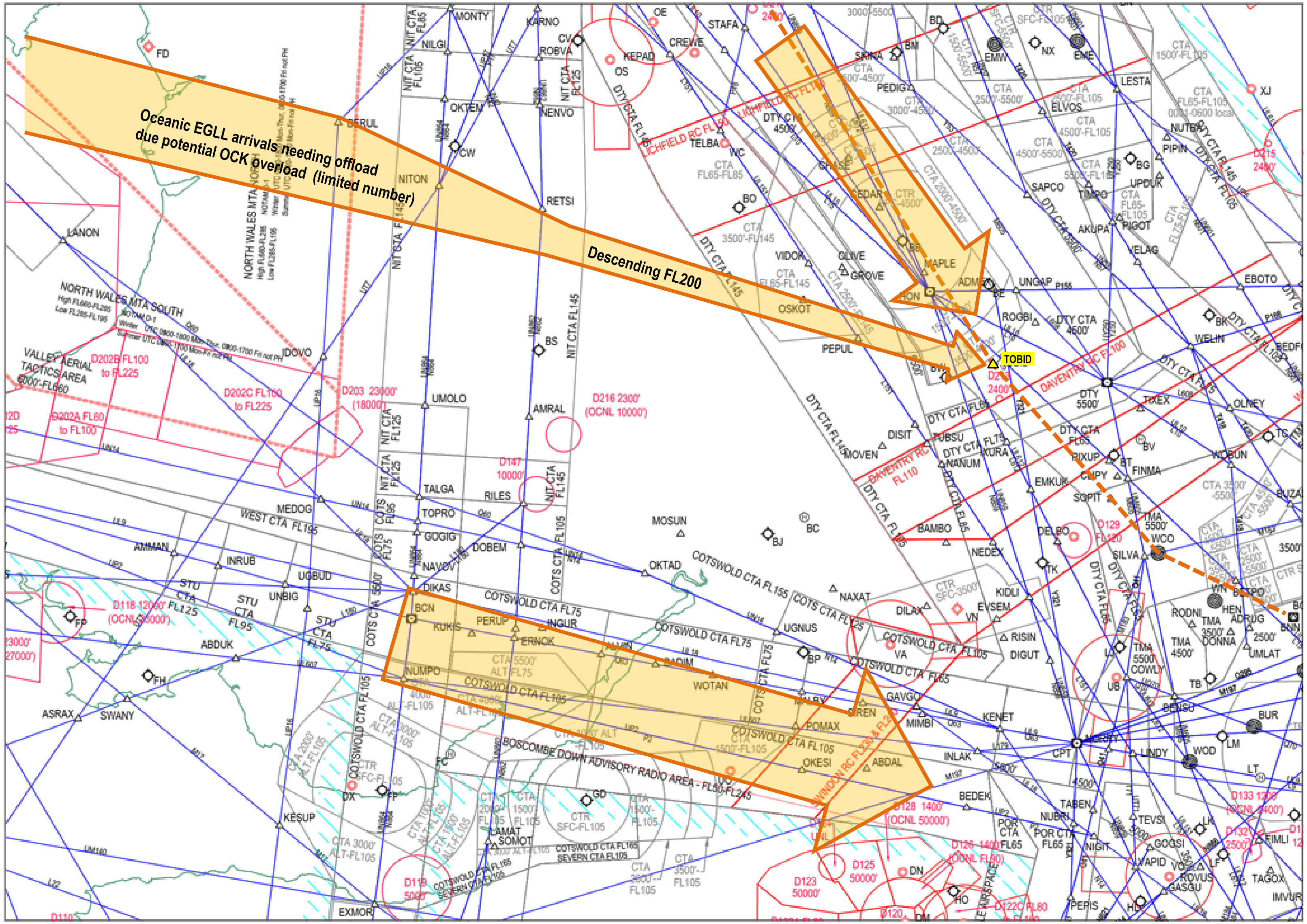


Figure 8 Airspace and Route Design Concept Option EGLL-3

6.3.1 This design concept was developed as part of NATS' engagement with the MoD. It contains similar uni-directional tactical eastbound OCK offload route(s) as EGLL-1 and EGLL2, but the offload routes would not descend below FL200 across the region.

6.3.2 This design concept would not require any new CAS. There would be minimal impact on the MoD or GA.

6.3.3 There would be no changes to Heathrow arrival flight paths below 7,000ft.

6.3.4 Design Concept Option EGLL-3 defines the route structure but does not become a describable option until conditional route categories are assigned. These are numbered and described as follows:

- Conditional route category:
    - EGLL-3A: CDR 1 Always plannable during the times published in ENR3
    - EGLL-3B: CDR 1/3 Always plannable during the times published in ENR3 and available tactically outside those hours, at ATC discretion
    - EGLL-3-C: CDR 3 Not flight plannable, only available tactically at ATC discretion

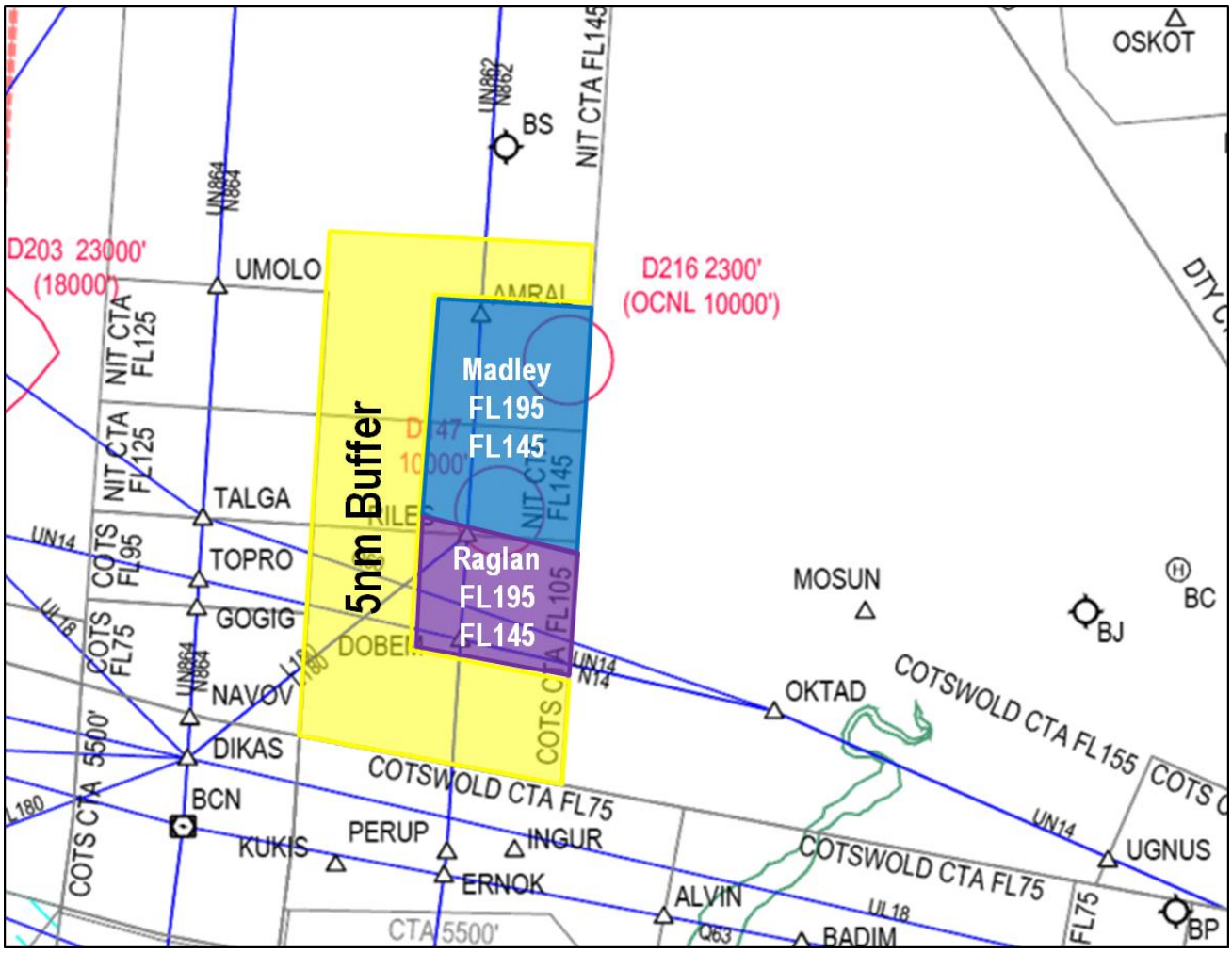
7. RILES Gliding Area

This section is not a design option *per se*, but it considers the RILES Gliding Area in the context of other design options.

The RILES Gliding Area consists of two boxes defined within the Class A CAS volumes NITON CTA9, NITON CTA12 and COTSWOLD CTA11; these are in the vicinity of the Brecon Beacons, BCN VOR and Shobdon aerodrome (EGBS).

The boxes are known as Madley (north, FL145 to FL195) and Raglan (south, FL105 to FL195). They are managed under the conditions of a Letter of Agreement (LoA) between NATS Swanwick, NATS Cardiff, the British Gliding Association and Swanwick Military Control (RAF(U) Swanwick).

When activated, the RILES Gliding Area permits gliding to take place within the lateral and vertical confines of the box, which is defined as Class A CAS.



NATS' direct engagement talks with the BGA reveal that, even though the area is not activated often (a few times per year), it remains a very important area due to the specific topography of the region and the consequential use gliders can make of its localised atmospheric effects under certain weather conditions.

NATS understands and acknowledges its importance to the BGA.

The BGA states that the same lateral and vertical dimensions should be useable as per the LoA, even with additional CAS in its eastern vicinity (see the EGBB and EGLL design concepts earlier in this document).

This statement is caveated by the BGA which reserves the right to consider negotiating alternate lateral and vertical dimensions at a later date post-implementation, as the potential future impacts are not yet knowable.

8. ATS Routes Overview

SAIP has a requirement to, where possible; enable fuel and CO_2 savings for airline operators as part of NATS' 10% reduction target for RP2. SAIP AD5 contributes to this objective by adding and amending some ATS routes within the western region; aiming to shorten flightplan track mileage for some flights.

Some of the proposed changes formalise today's common tactical behaviours, known as a tactical-direct. Some mimic trajectories expected to be seen in Free Route Airspace (another requirement of SAIP), and others remove unnecessary restrictions on existing routes.

The proposed routes affect traffic operating above FL195, introduce no expected impact on GA airspace users, and would not lead to a change in traffic patterns below 7,000ft. Potential interactions between civil and military would be coordinated and managed.

For the purpose of this document, some of the proposed ATS routes are described in individual segments, in order to better explain their proposed function. For example, proposed new ATS route P19 starts at POL and ends 156nm further south at ASRAX, but each segment of that proposed route is described individually.

The ATS route segments should be considered as operational H24, unless dependent on a danger area or military training area where an appropriate CDR category would be required. Actual times of availability and other flightplanning restrictions would depend on the operational impact of any additional complexity that these routes may introduce. Therefore presuming implementation, a restriction (e.g. by time, by departure or by destination) may need to be applied via RAD to protect existing sector capacity levels.

In each below chart, the proposed ATS route segments are shown in purple and their current equivalents are shown as dashed orange.

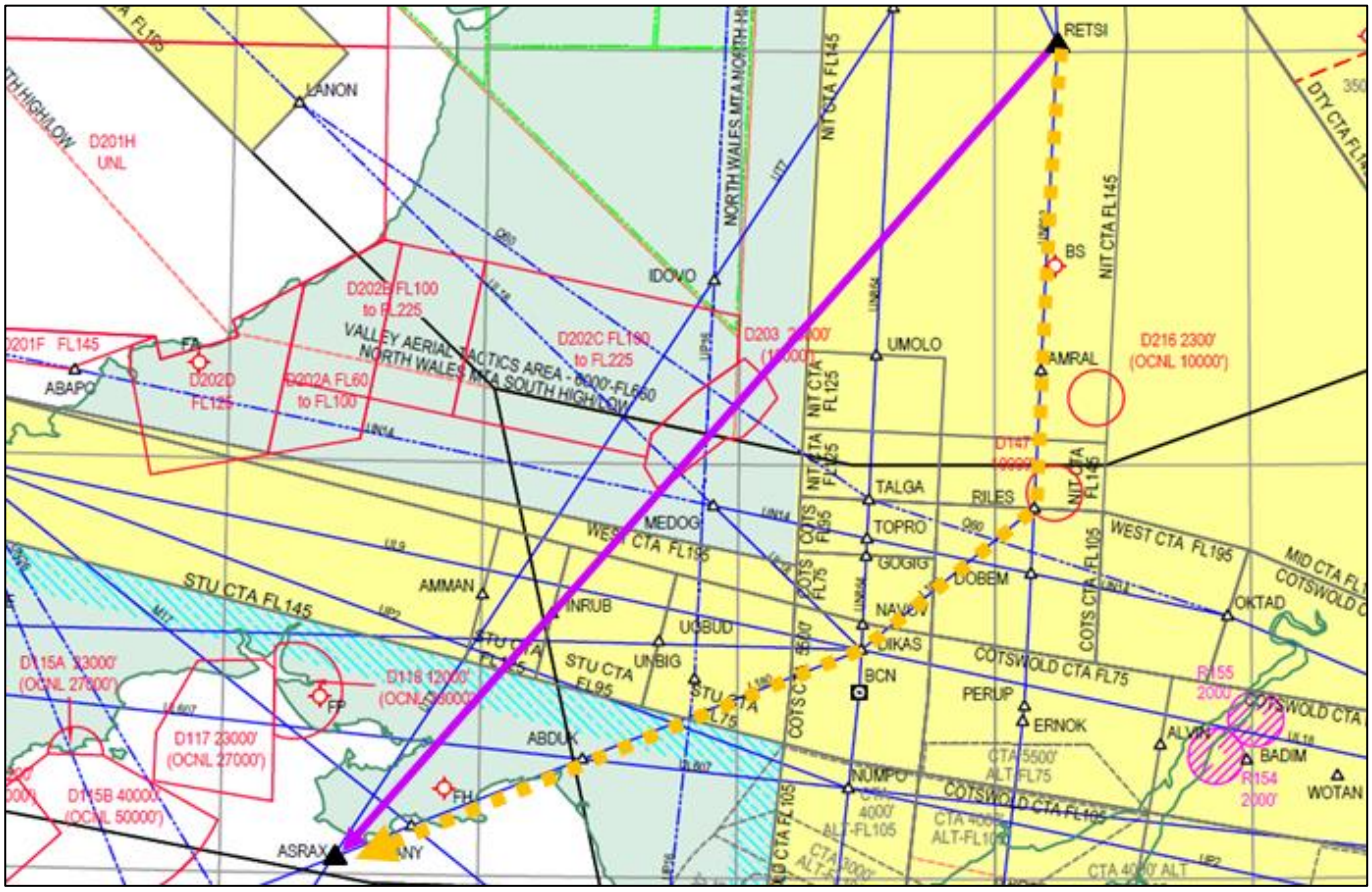
8.1 RETSI – ASRAX, P19

8.1.1 This segment of the proposed uni-directional southbound ATS route P19 would formalise the high-level tactical-direct that controllers currently issue for Manchester TMA traffic exiting the UK FIR via the Land's End area, en route to the Canaries or Caribbean destinations.

8.1.2 This route segment is expected to be used by EGCN, EGNM and EGGP departures.

8.1.3 This route segment would only be available outside the notified hours of the NWMTA, necessitating a CDR category TBC. Flights using this route element would need to be FL245+ by RETSI.

8.1.4 The current equivalent flightplan route is RETSI – RILES – DIKAS – ASRAX.



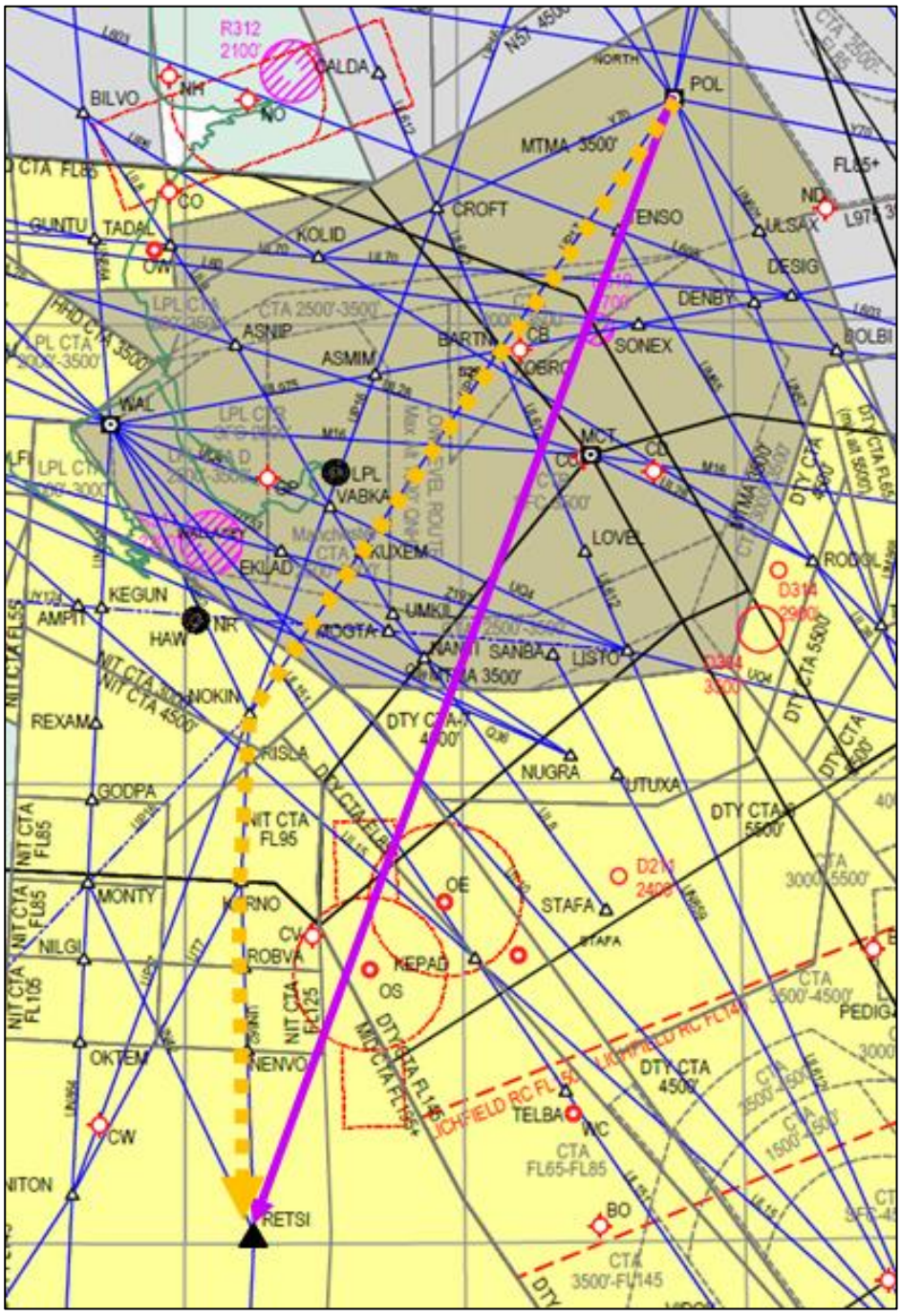
8.2 POL – RETSI, P19

8.2.1 This segment of the proposed uni-directional southbound ATS route P19 would allow a direct route for Prestwick controllers to use for some southbound Sector 5 traffic.

8.2.2 This route segment is expected to be used by EGCN and EGNT departures.

8.2.3 This route segment would operate H24.

8.2.4 The current equivalent flightplan route is POL – NOKIN – KARNO – RETSI.



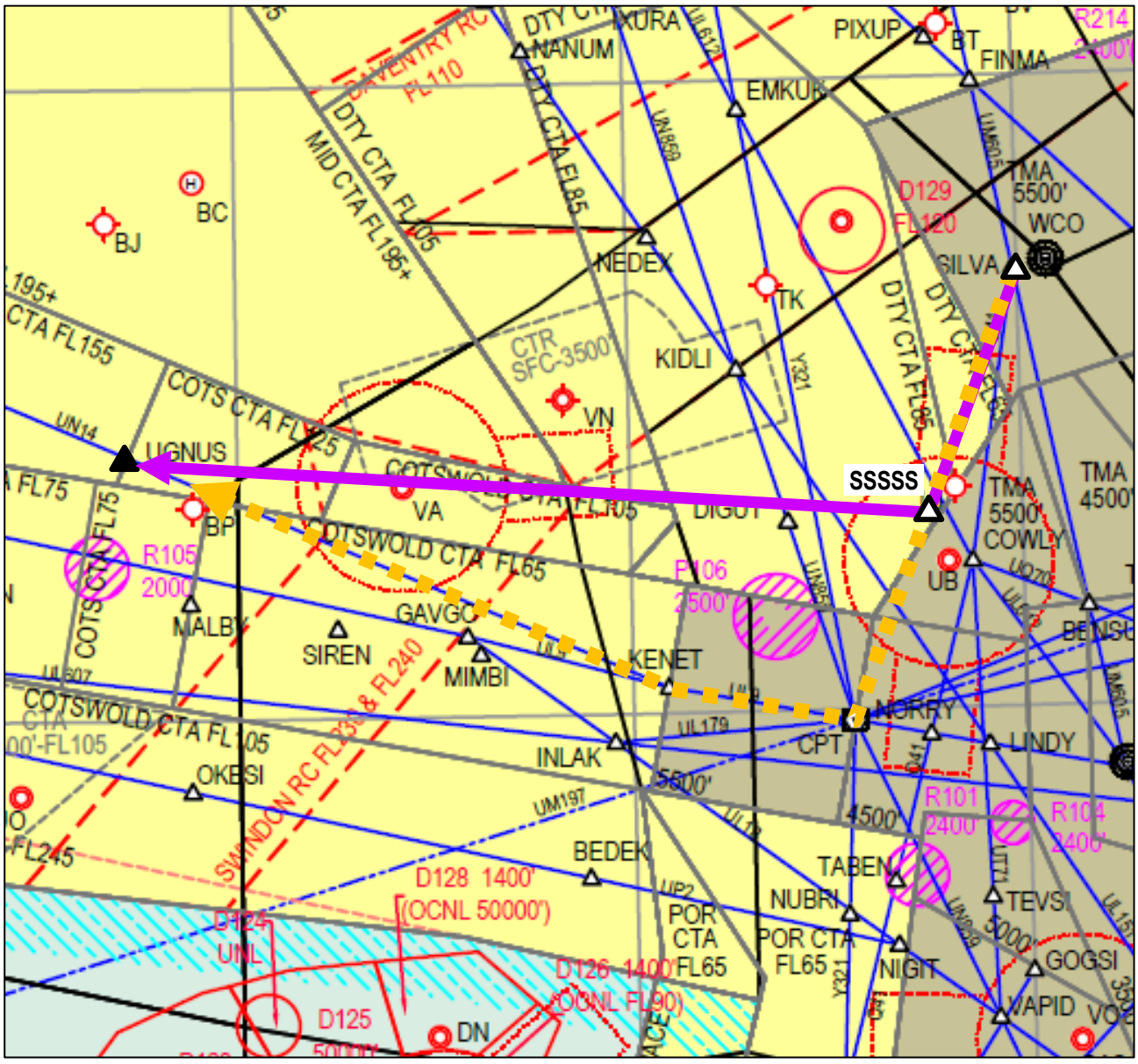
8.3 SILVA – SSSSS – UGNUS, ATS route designator TBC

8.3.1 This segment of the proposed uni-directional westbound ATS route (TBC) would allow some flights to turn west earlier.

8.3.2 This route segment is expected to be used by EGSS departures.

8.3.3 This route segment would operate H24. Traffic must be FL195+ by the western edge of the DTY CTA.

8.3.4 The current equivalent flightplan route is SILVA – CPT – KENET - UGNUS.



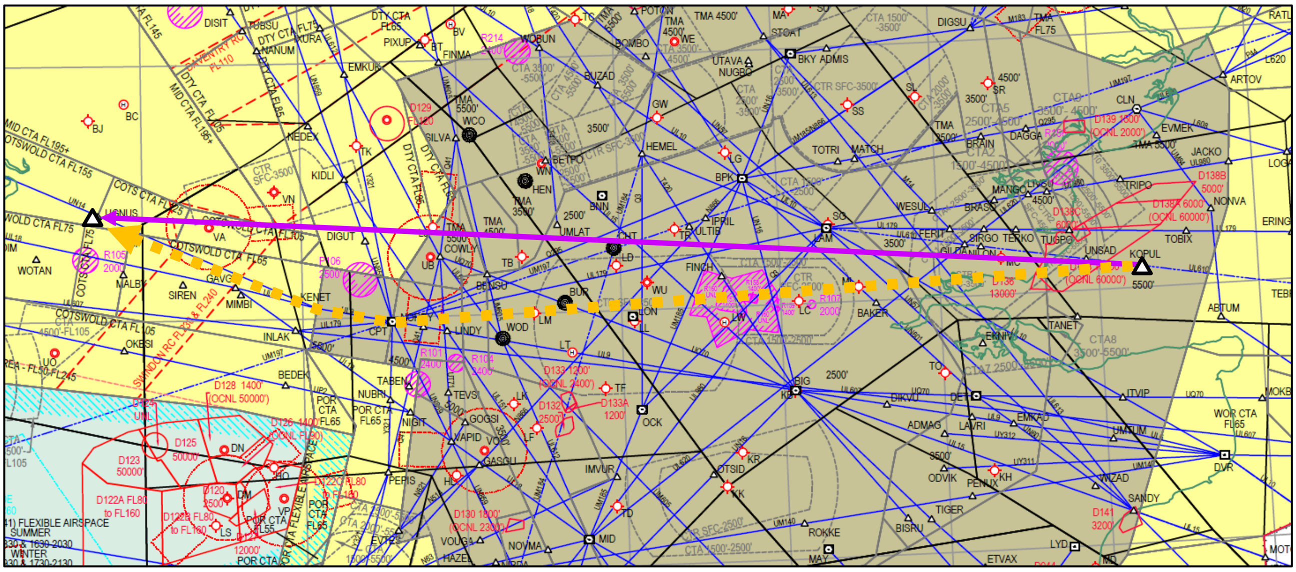
8.4 KOPUL – UGNUS, Q60

8.4.1 This segment of the proposed ATS route Q60 was requested via the FEP (Flight Efficiency Partnership) meeting as a more direct westbound route.

8.4.2 This route segment is expected to be used by LTMA overflights

8.4.3 This route element would operate H24.

8.4.4 The current equivalent flightplan route is KOPUL – CPT – KENET – UGNUS.



8.5 LANON – UGNUS – GAVGO and LANON – MORAG, Q60

8.5.1 These segments of the proposed ATS route Q60 formalise a common pair of tactical-directs – the former is bi-directional, the later is uni-directional and both are westbound.

8.5.2 The UGNUS – LANON segment is expected to be used by UK overflights, and by EIDW arrivals.

8.5.3 The UGNUS – LANON route segment would only be available outside the notified hours of the NWMTA/TRA(G), necessitating a CDR category TBC.

8.5.4 The UGNUS – LANON route segment's current equivalent flightplan route is UGNUS – OKTAD – TALGA – LANON.

8.5.5 The LANON – MORAG route segment is expected to be used by UK / Eire overflights.

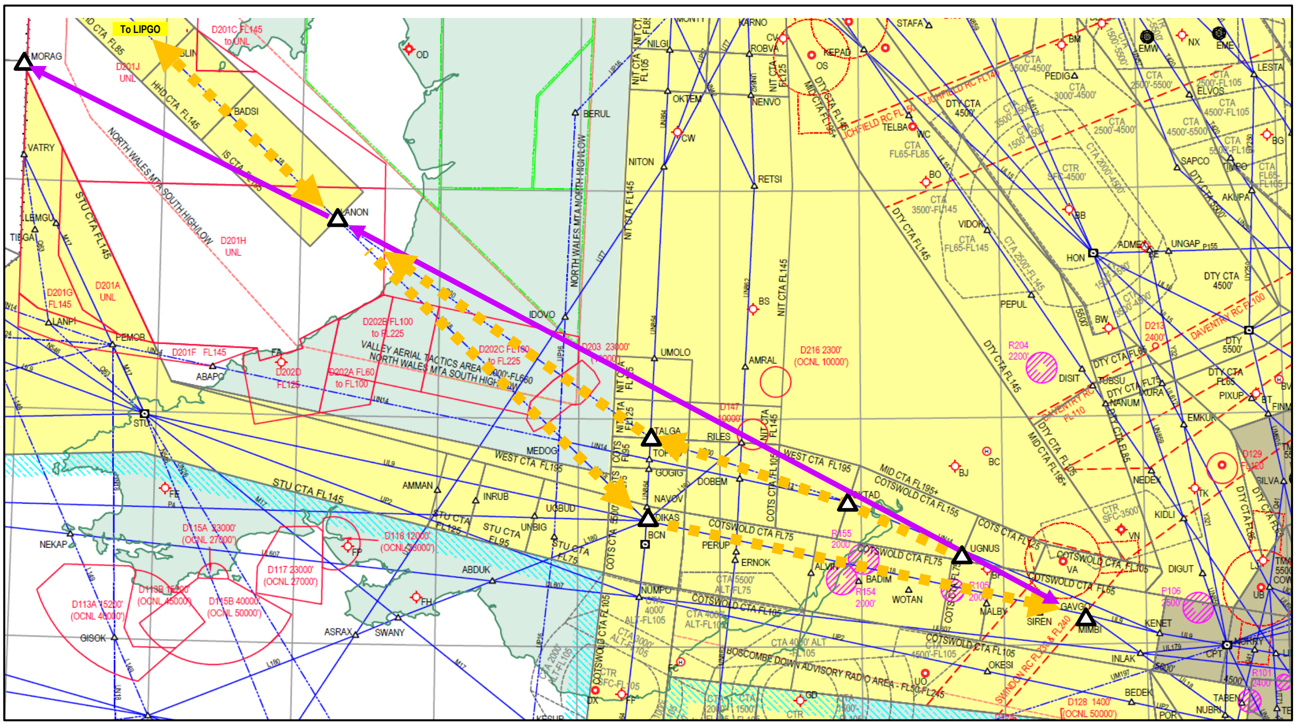
8.5.6 The LANON – MORAG route segment would only be available outside the notified hours of the NWMTA/TRA(G), necessitating a CDR category TBC.

8.5.7 The LANON – MORAG route segment's current equivalent flightplan route is LANON – LIPGO.

8.5.8 The LANON – UGNUS – GAVGO segment is expected to be used by UK overflights, and by EIDW departures.

8.5.9 The LANON – UGNUS – GAVGO route segment would only be available outside the notified hours of the NWMTA/TRA(G), necessitating a CDR category TBC.

8.5.10 The LANON – UGNUS – GAVGO route segment's current equivalent flightplan route is LANON – DIKAS - GAVGO.



8.6 LIPGO – MARCH – HON, Y125 and MORAG – MARCH – HON, P155 extension

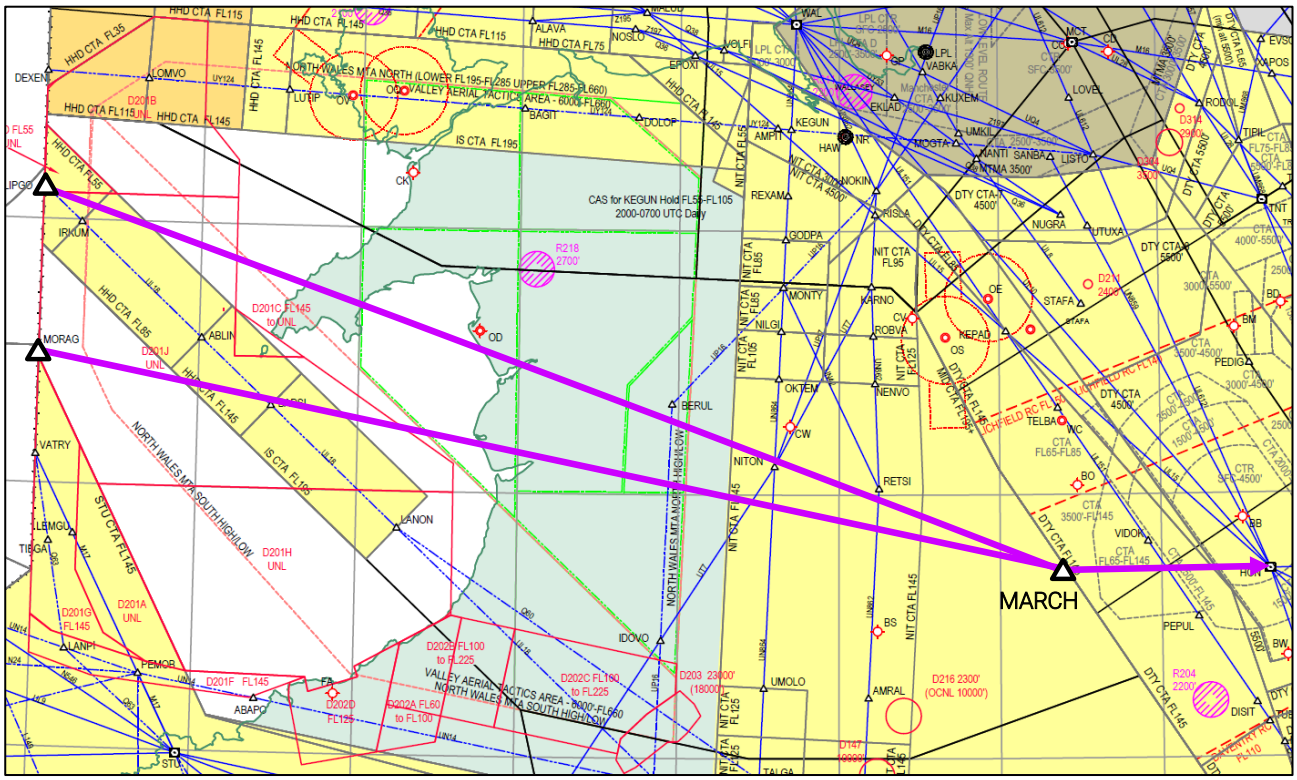
8.6.1 These two proposed uni-directional eastbound ATS routes would have two different purposes:

8.6.1.1 Both routes may be used by overflights to leave the UK via REDFA or SOMVA, removing that flow from the Lakes Sectors and Central Sectors.

8.6.1.2 Both routes may be used by some EGLL arrivals identified by ATC as needing to be stack-swapped OCK to BNN (see design concepts EGLL-1 and EGLL-2 earlier in this document).

8.6.2 Both routes would only be available outside the notified hours of the NWMTA/TRA(G), necessitating a CDR category TBC.

8.6.3 There is no current equivalent flightplan route for these flows, however ATS route P155 currently ends at HON, therefore MORAG – MARCH – HON would be its extension.
Traffic may need to be RAD-restricted in order to manage demand.



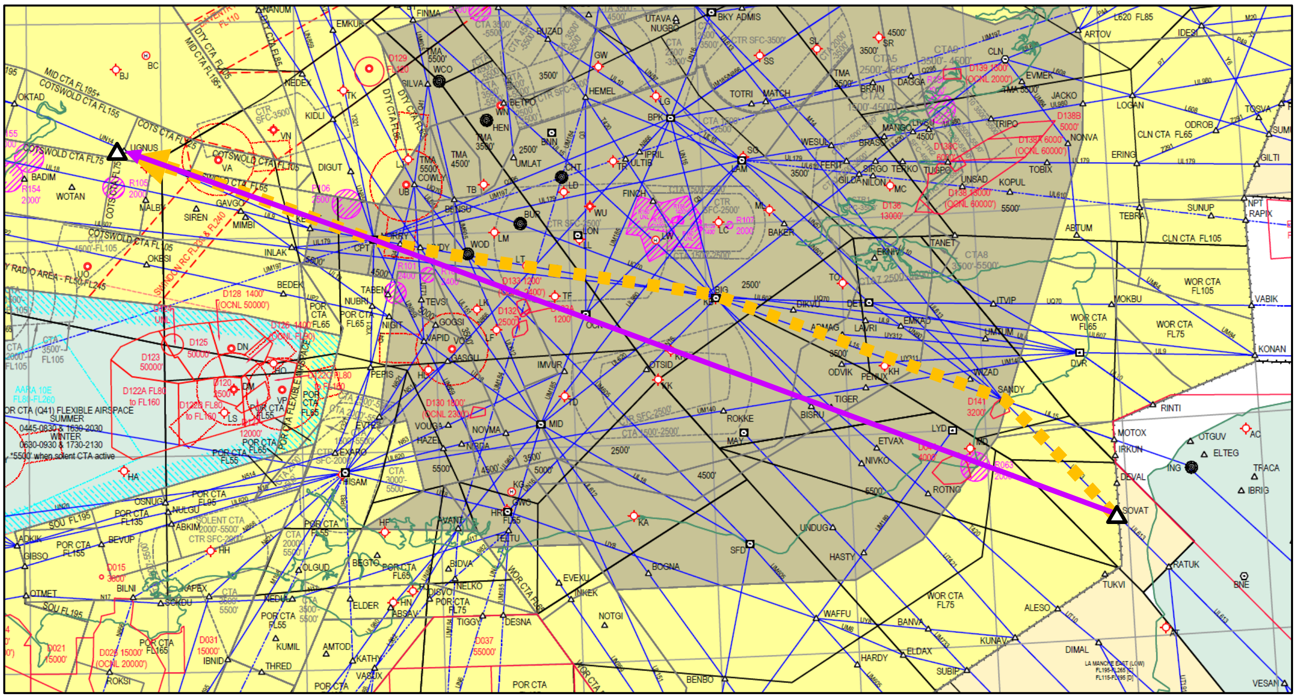
8.7 SOVAT – CPT – UGNUS, Q73

8.7.1 This proposed ATS route would formalise a currently used tactical-direct.

8.7.2 This route is expected to be used by some UK overflights entering the UK FIR at SOVAT, leaving the UK FIR via oceanic entry points or destinations in Eire.

8.7.3 This route would operate H24. Flights using this route would be FL360+ at CPT.

8.7.4 The current equivalent flightplan route is SOVAT – SANDY – BIG – CPT – UGNUS.



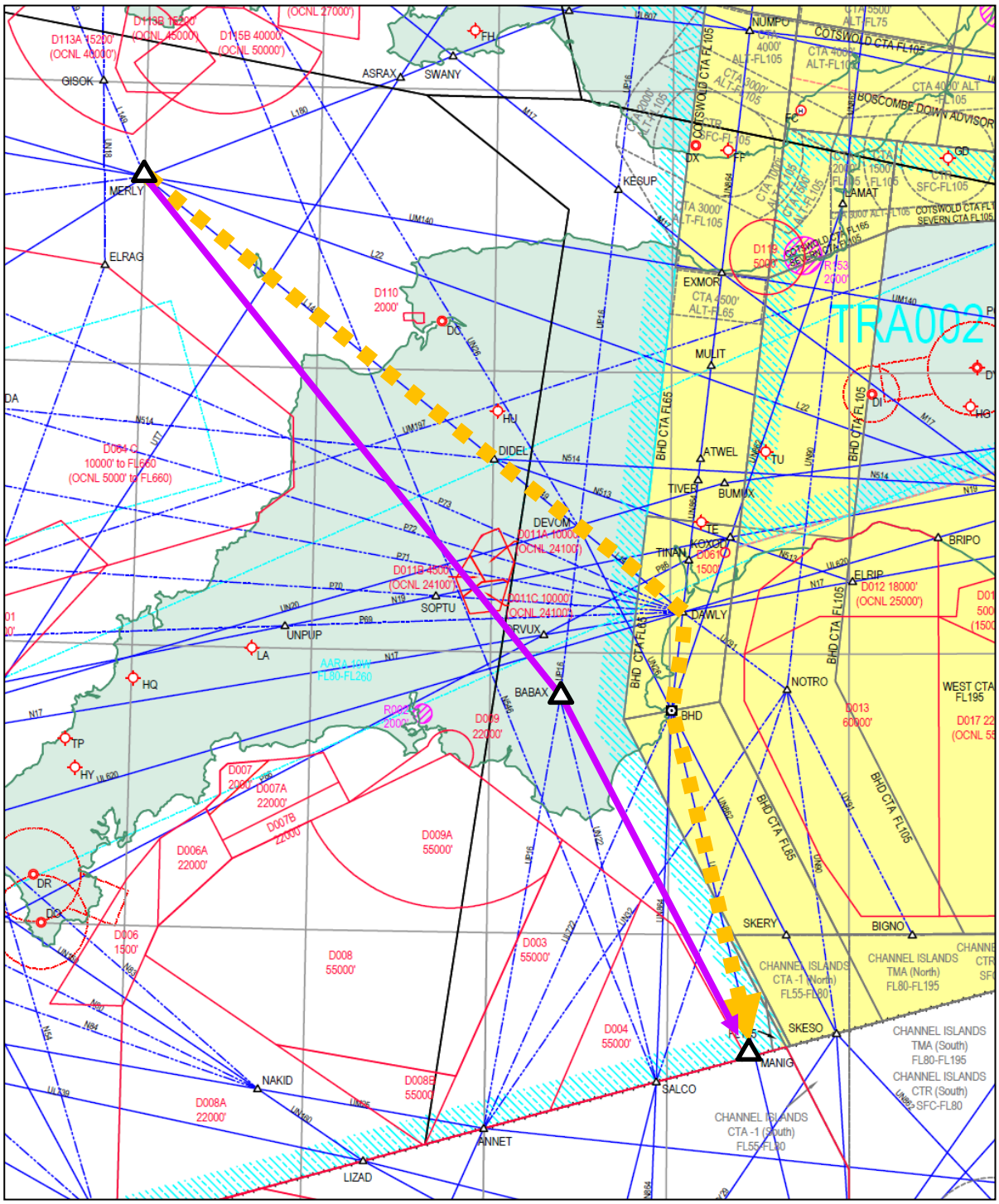
8.8 MERLY – BABAX – MANIG, ATS route designator TBC

8.8.1 This proposed uni-directional southbound ATS route would provide an alternative route choice for some flights crossing Devon and leaving the UK to the south.

8.8.2 This route is expected to be used by some EIDW and EGA* southbound departures.

8.8.3 This route would only be available outside the notified hours of EGD 004 Plymouth, necessitating a CDR category TBC.

8.8.4 The current equivalent flightplan route is MERLY – DEVOM – DAWLY – BHD – MANIG.



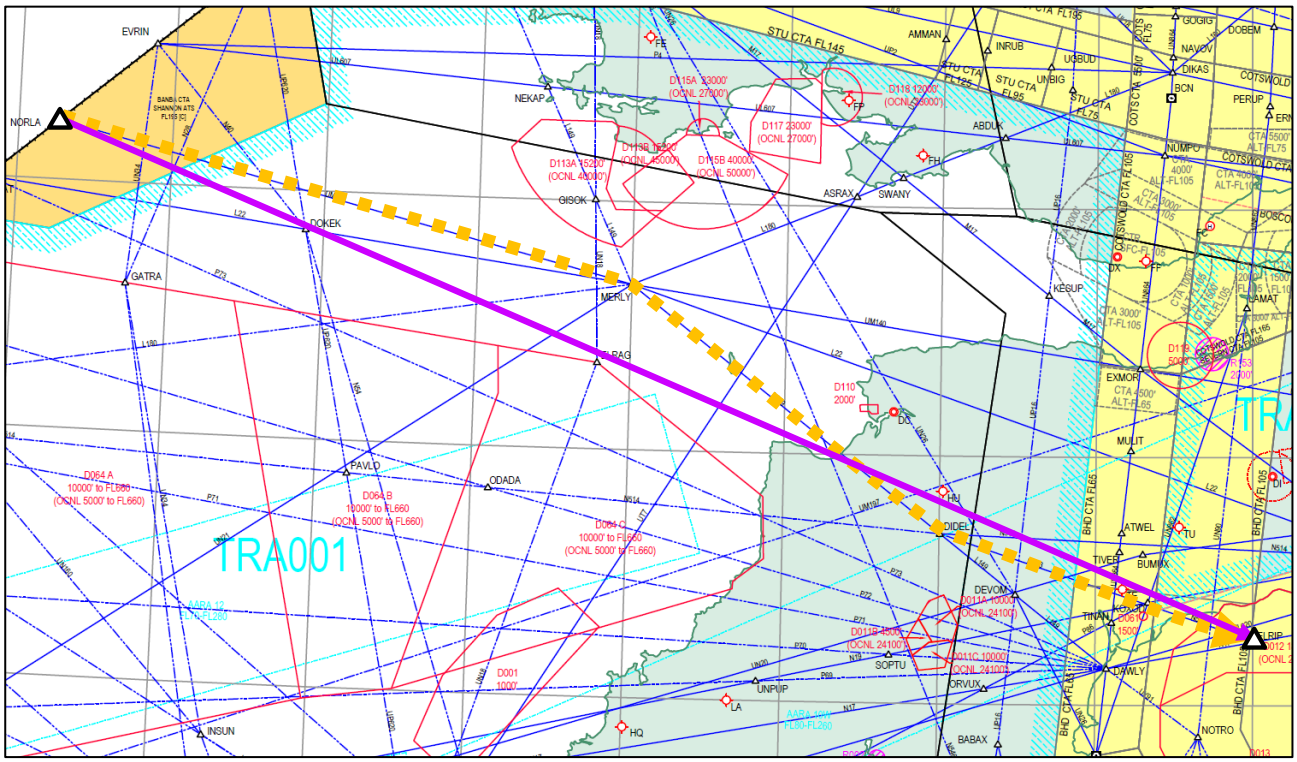
8.9 NORLA – ELRIP, ATS route designator TBC

8.9.1 This proposed uni-directional eastbound ATS route would provide an alternative route choice for some oceanic flights.

8.9.2 This route is expected to be used by some oceanic flights arriving via the OTMET 1G STAR for Gatwick.

8.9.3 This route would only be available outside the notified hours of EGD 064C South West Managed Danger Area, necessitating a CDR category TBC.

8.9.4 The current equivalent flightplan route is NORLA – MERLY – DIDEL – ELRIP.



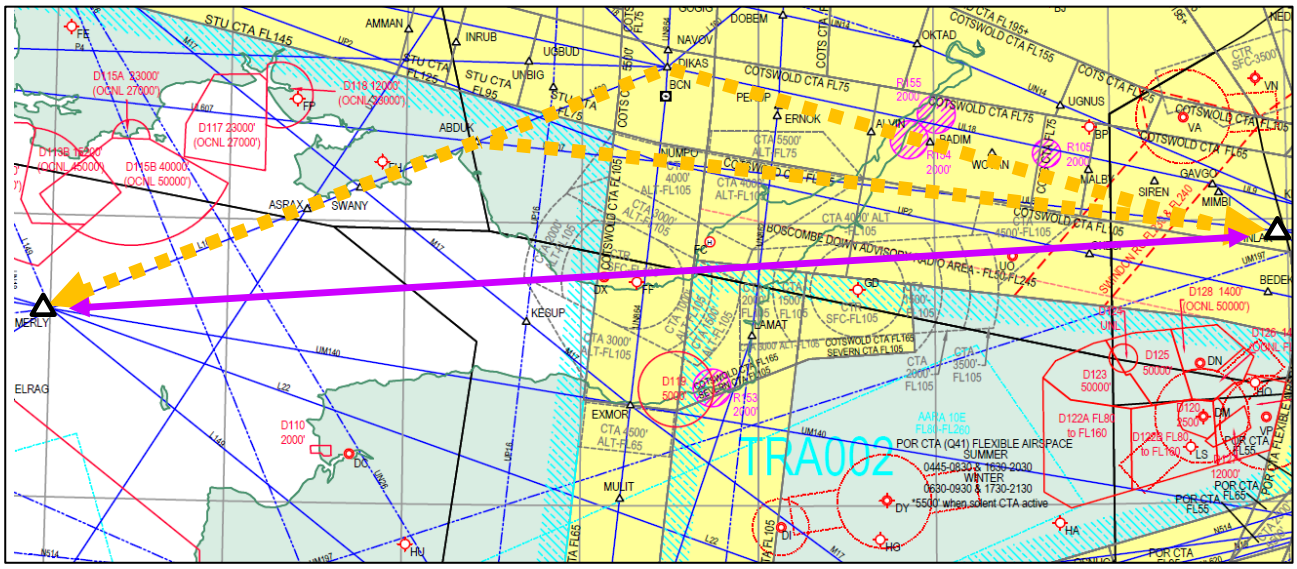
8.10 MERLY – INLAK, ATS route designator TBC

8.10.1 This proposed bi-directional eastbound ATS route would mimic a predicted Free Route trajectory.

8.10.2 This route is expected to be used by flights overflying the UK FIR, such as German departures to the Caribbean.

8.10.3 This route would operate H24.

8.10.4 The current equivalent flightplan routes are (eastbound) MERLY – ABDUK – INLAK and (westbound) INLAK – DIKAS – MERLY.



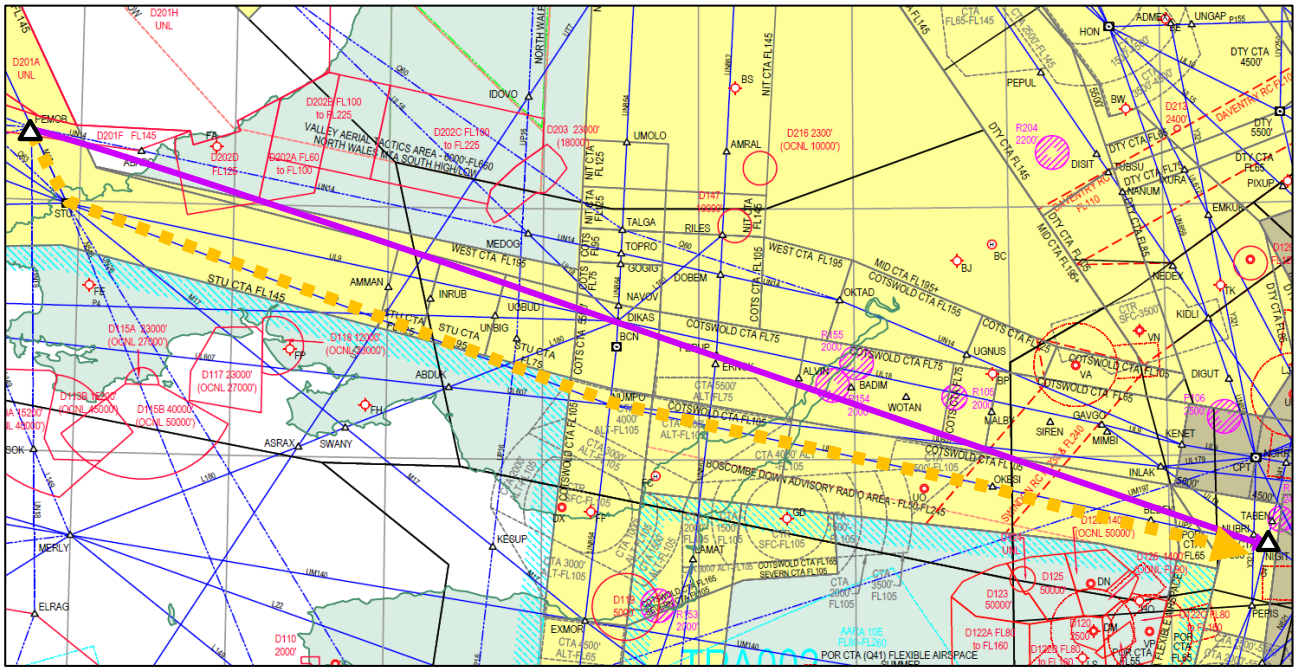
8.11 PEMOB – NIGIT, N24 extension

8.11.1 This segment of the proposed uni-directional eastbound ATS route N24 would formalise a commonly issued tactical-direct and would also mimic a predicted Free Route trajectory.

8.11.2 This route segment is expected to be used by some UK overflights.

8.11.3 This route segment would operate H24.

8.11.4 The current equivalent flightplan route is PEMOB – STU – NUMPO – OKESI – NIGIT.



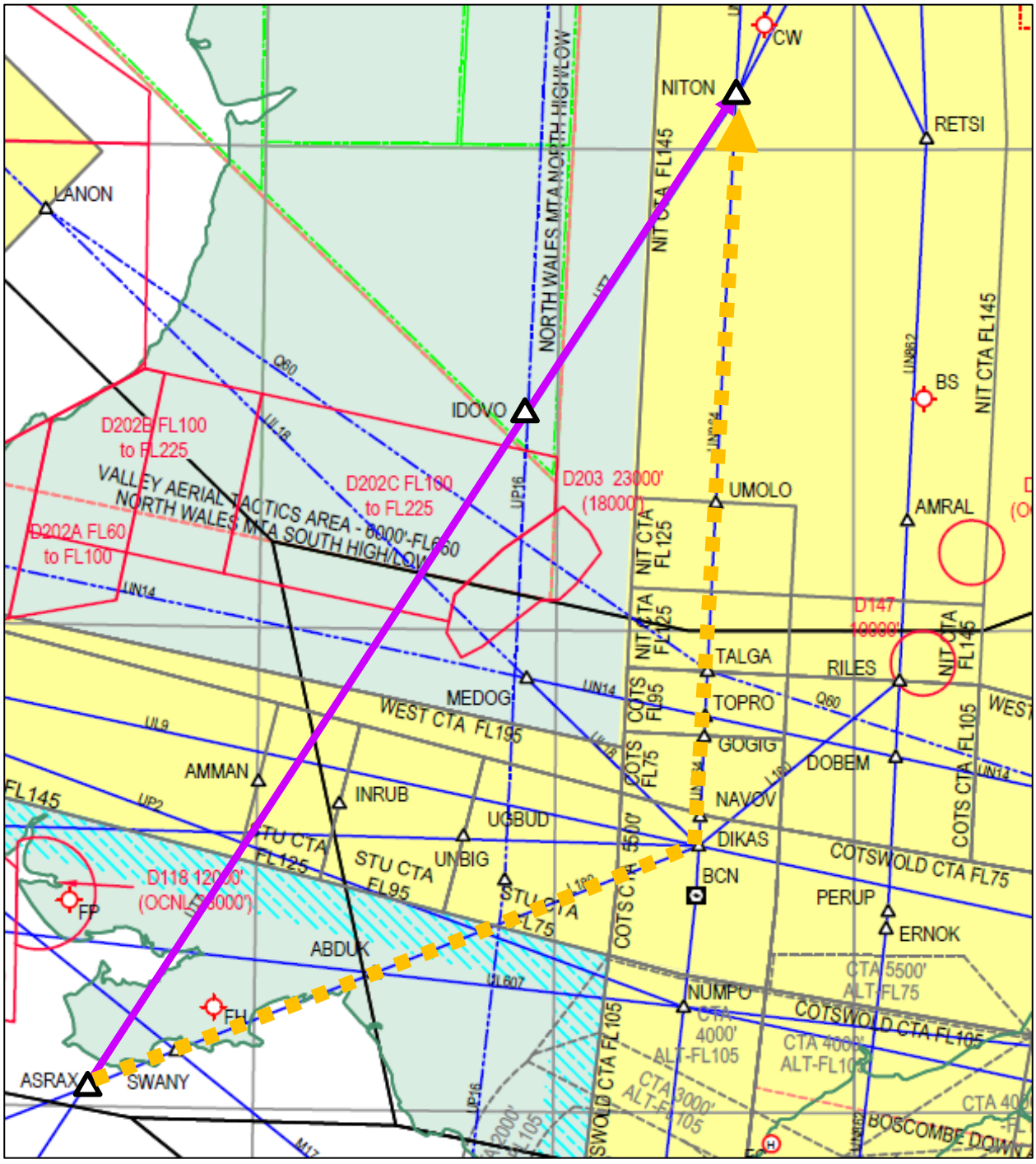
8.12 ASRAX – IDOVO – NITON, UT7 (to become T7)

8.12.1 This existing uni-directional northbound ATS route UT7 would be lowered, removing restrictions for some flights.

8.12.2 This route is expected to be used by EGCC, EGNM and EGCN arrivals from Iberia and the Canaries. Currently UT7 is not available to such traffic because it is defined as FL245+. Its base FL would change to FL195.

8.12.3 This route would only be available outside the notified hours of the NWMTA/TRA(G), necessitating a CDR category TBC.

8.12.4 The current equivalent flightplan route is ASRAX – DIKAS – NITON.



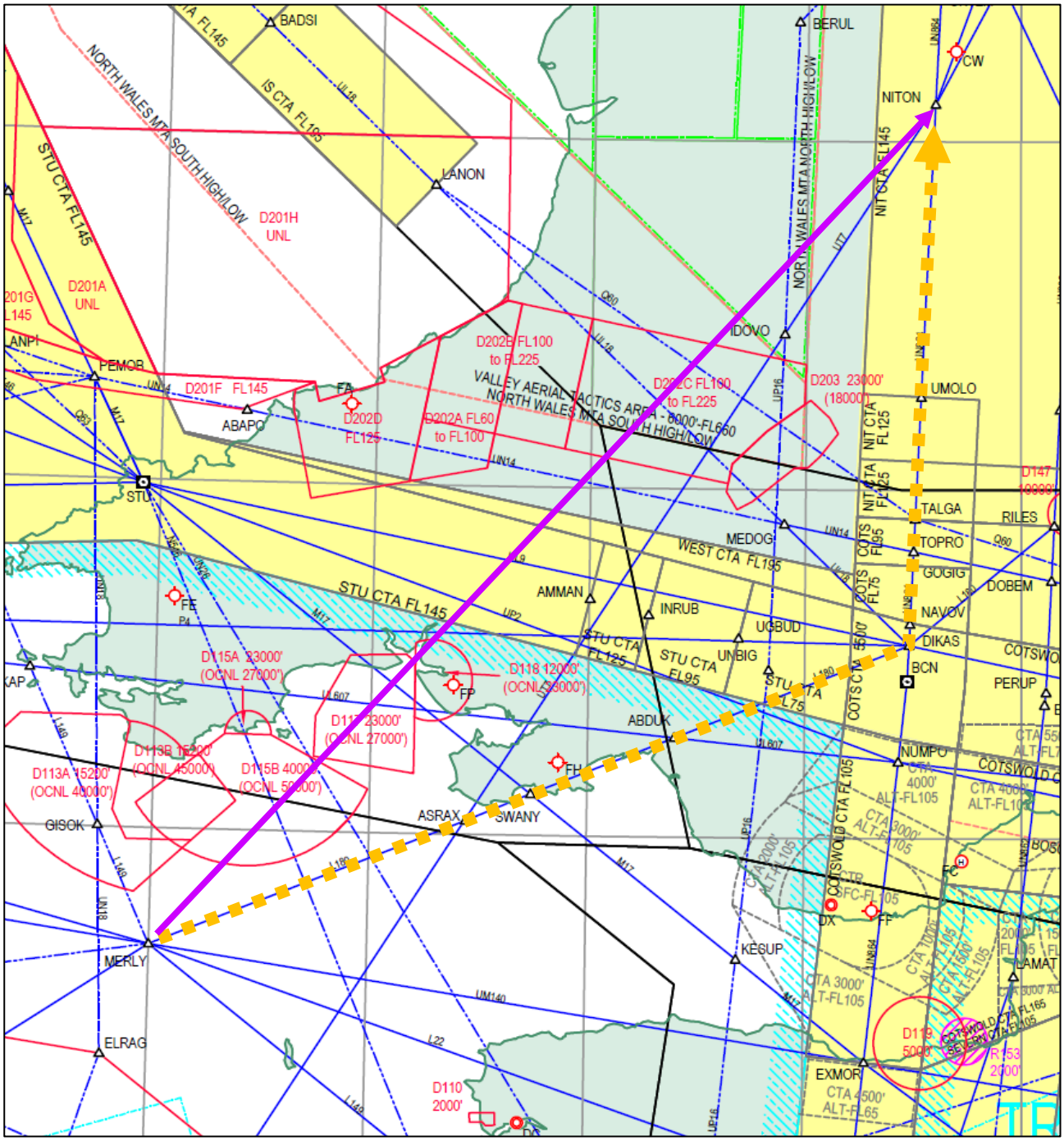
8.13 MERLY – NITON, UN21 extension (to become N21)

8.13.1 This uni-directional northbound ATS route extension of UN21, would be used as an alternative option to T7 (see section 8.12 above).

8.13.2 This route is expected to be used by EGCC, EGNM and EGCN arrivals from Iberia and the Canaries.

8.13.3 This route would only be available outside the notified hours of the NWMTA/TRA(G), necessitating a CDR category TBC.

8.13.4 The current equivalent flightplan route is MERLY – ASRAX – DIKAS – NITON.



9. TRA 002 Design Concept

Temporary Reserved Areas (TRAs) are volumes of Class C CAS, FL195-FL245, dedicated for military use on weekday daytimes. TRA 002 is one of several around the country. One of its corners is relevant to the SAIP AD5 area of interest. That corner is rarely used by the MoD because of its geometry, and is otherwise generally surrounded by civil-use CAS – see illustrations below.

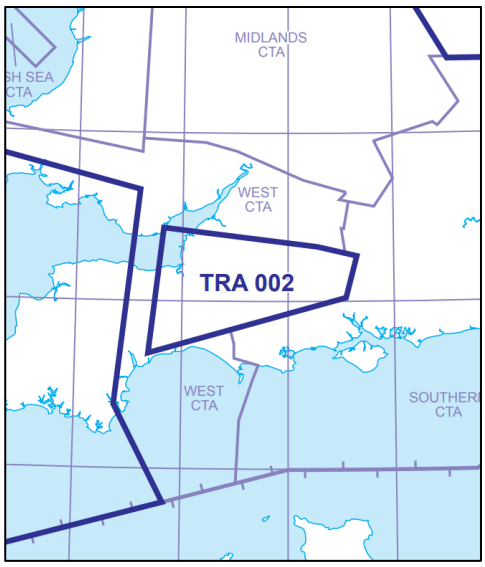


Figure 9 TRA 002 general location

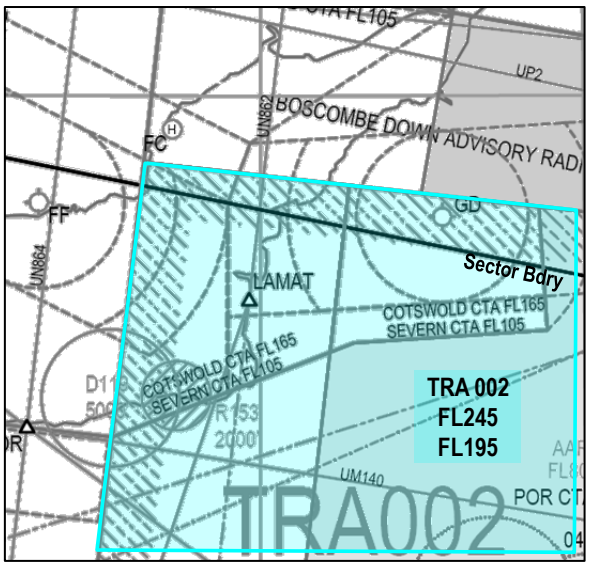


Figure 10 TRA 002's NW corner, LAMAT vicinity

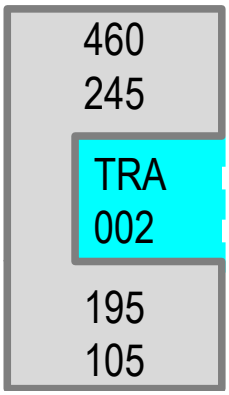


Figure 11 (right)
Side elevation illustration of LAMAT corner

Under SAIP AD5, we propose to introduce new routes linking EGBB with the wider route network, in particular to the south and southwest (see EGBB design concepts earlier in this document).
To avoid TRA 002 in the NW corner (vicinity of LAMAT), the newly-routed EGBB departures would need to either stay below FL195, or exceed FL245 by the time they reach the Bristol area.
In discussion with the MoD, it has become possible to reconsider that NW corner arrangement. The design reason is that Birmingham departures could climb more continuously in the region, either SW-bound across the corner, or S-bound improving the likelihood of exceeding FL245 before crossing TRA 002's revised boundary (see below).

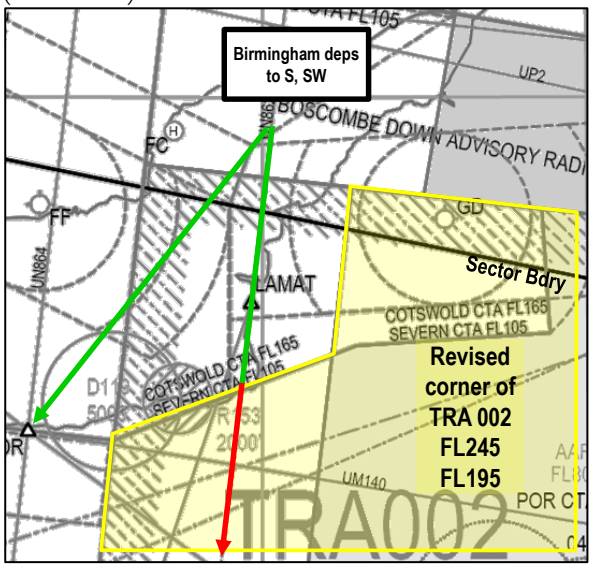


Figure 12 Proposed TRA 002 arrangement

Kindly, the MoD (via DAATM) has formally agreed that this may become part of SAIP AD5's development work, with permission granted for NATS to progress this on behalf of the MoD.

10. Combined design option concepts

Until now, this document describes a longlist of components which could be combined to make up the wider SAIP AD5 structure.

During this options development phase, civilian and military ATC experts held discussion workshops with airlines and the GA community as per Section 3 on Page 3. At these workshops (and subsequently via direct phone calls and emails), some reasonable combinations of EGBB and EGLL CAS volume options were developed and discussed. Development simulations were held using draft versions of the routes and CAS described in EGBB-1 and EGLL-1, in order to ensure their viability.

During the engagement and discussions, the MoD and GA representatives were clear on the importance of airspace sharing, and the simplicity of its activation/deactivation. They were also clear that the application of CAS classifications should be cognisant of potential impacts; where logically the lower the CAS the more likely there would be an impact.

It would be disproportionate to attempt to describe every possible permutation of EGBB and EGLL airspace classifications and conditional times of activation.

We consider the following descriptions of options as reasonable for consideration, due to them being already explored by NATS, MoD, airlines, GA and Birmingham Radar in ongoing engagement discussions.

In both combined concept options the green area nearer EGBB would be arranged as per Paragraph 5.1.4 on Page 11, with the lower levels managed by Birmingham Radar under FUA and the higher levels H24 managed by TC MID. In the green region we would expect Class D to be the most appropriate at the lowest levels. Elsewhere in the region we would expect Class C to be the most appropriate at the higher levels, again FUA except for one particularly high-level volume H24 Class A. The yellow area could be vertically split at FL155 Class A H24 to match the adjacent Cotswold CTA5, with a lower yellow volume FL125-FL155 Class C FUA.

- Combined Concept 1 – larger Class D CAS volume near EGBB:
    - Combi-1A: Evenings/overnights/mornings, 7 days a week – disestablished during the day, with appropriate clawback arrangements or consideration of planned special events
    - Combi-1B: Evenings/overnights/mornings weekdays and H24 weekends – disestablished during weekday daytimes

- Combined Concept 2 – smaller Class D CAS volume near EGBB:
    - Combi-2A: Evenings/overnights/mornings, 7 days a week – disestablished during the day, with appropriate clawback arrangements or consideration of planned special events
    - Combi-2B: Evenings/overnights/mornings weekdays and H24 weekends – disestablished during weekday daytimes

In all four combinations, the time restrictions apply to the proposed EGBB and EGLL routes & FUA CAS. The higher-level ATS routes and TRA 002 are presumed to be available at the times described in their respective sections of this document.

The charts below illustrate the concept options (routes removed for chart clarity).

10.1 Combined Concept 1 (illustrating proposed options Combi-1A and Combi-1B)

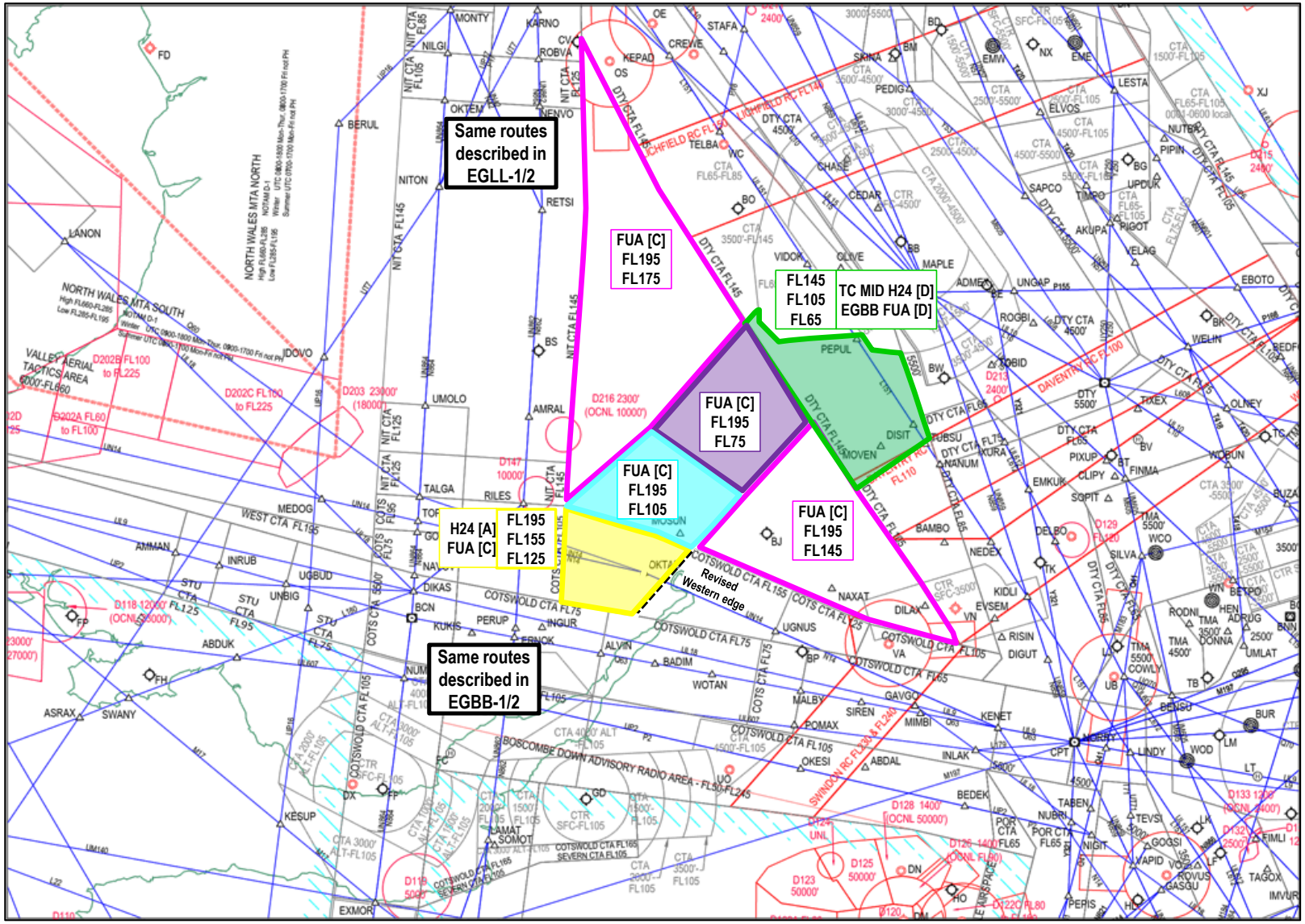


Figure 13 Combined Concept 1 - routes not shown

10.2 Combined Concept 2 (illustrating proposed options Combi-2A and Combi-2B, a narrower green CAS volume near EGBB)

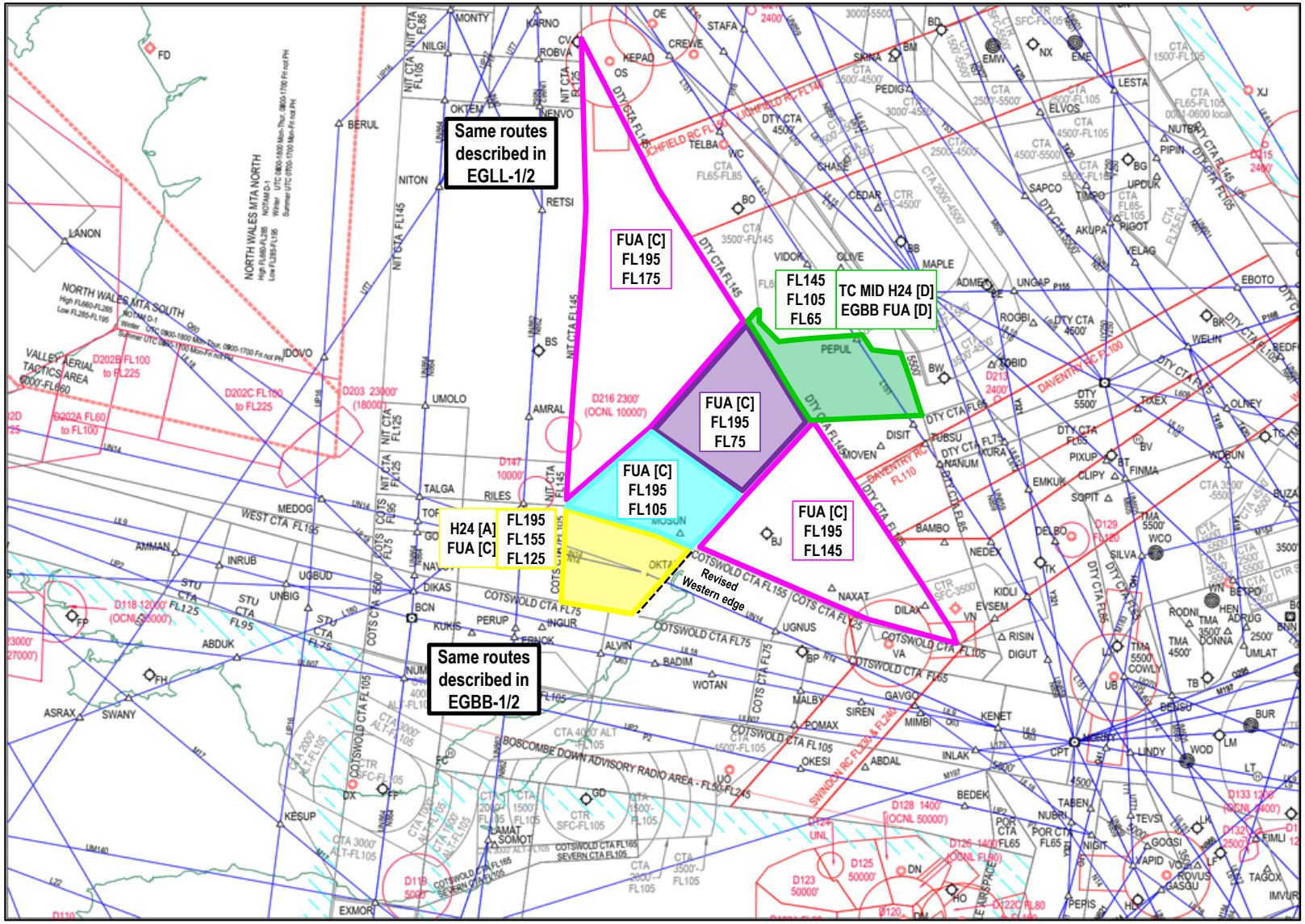


Figure 14 Combined Concept 2 - routes not shown

11. Conclusion and Next Steps

11.1 We engaged with appropriate airline, MoD, GA and airport stakeholders, resulting in comprehensive discussions on the possibilities for the region.

11.2 There are a formidable number of potential component permutations of route structures, lateral/vertical airspace boundaries, classifications of airspace and times of availability. It would be disproportionate to attempt to fully describe every possible component permutation.

11.3 In this document we have described a proportional and reasonable number of options, including system combinations which were explored in some detail with our stakeholders.

11.4 The next document, Step 2A(ii), will evaluate the design options listed in this document, reducing the longlist to a shortlist for appraisal.

End of document