Edinburgh Airport Airspace Change Programme 2022

Stage 2 Develop and Assess

Engagement

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Stage 2: Develop and Assess
ACP-2019-32

Engagement

Content

CAP1616 Stage 2 Stakeholder Engagement Report

Introduction

This report should be read alongside the Master Document, Design principles evaluation and Initial options Appraisal for Stage 2 of the Edinburgh Airport ACP 2019-32.

Why is our Airspace Changing?

Edinburgh Airport Limited is sponsoring an Airspace Change based on a Statement of Need submitted and approved by the CAA in the summer of 2019. The three main drivers behind the project are the need to modernise our airspace in line with the Airspace Modernisation Strategy (CAP1711), facilitate growth by increasing our capacity and the number of movements our single runway operation can facilitate, and finally to improve our mode of operation with a view to mitigating environmental factors as much as possible.

Airspace modernisation is required because the radio navigation beacons that aircraft currently use to navigate are coming to the end of their lifespan and there is a ready-made alternative in PBN (Precision Based Navigation) which uses satellite navigation to enable aircraft navigation. These flight paths will be designed to be flown more accurately and also allow for better fuel management and planning.

Our second driver is capacity and after the period of the pandemic our future capacity profile has changed. These capacity adjustments are described in the engagement material that follows but in summary we have moved from a major peak of departures in the early morning first wave, to some four peaks throughout the day. These peaks are at a lower aircraft movement level than our analysis projected before the pandemic. We are therefore working on a solution for these flight paths in our most up to date figures.

Our third and final driver is to consider environmental issues which include aircraft noise, quality of life, tranquility, health effects and CO2 emissions to name a few. These environmental considerations are detailed in our design principles and we need to show how we will apply these throughout the airspace change project. See the design principles in the next paragraph detailing Stage 1.

What we did at Stage 1 "Define"

Category	Number	Design principle
Safety (core)	DP1	The airspace design and its operation must be as safe or safer than it is today.
Safety (core)	DP2	Flight paths must be flyable and technically supported by air traffic control and airport technical management systems.
Operational (core)	DP3	Flight paths must be designed to allow modern aircraft to use performance-based navigation (PBN) in line with CAA's modernisation strategy
Operational (core)	DP4	Routes to/from Glasgow and Edinburgh airports must be procedurally deconflicted from the ground to a preferred level in coordination with NATS Prestwick.
Operational (core)	DP5	The predictability of flight tracks must be maximised for consistency of operations.

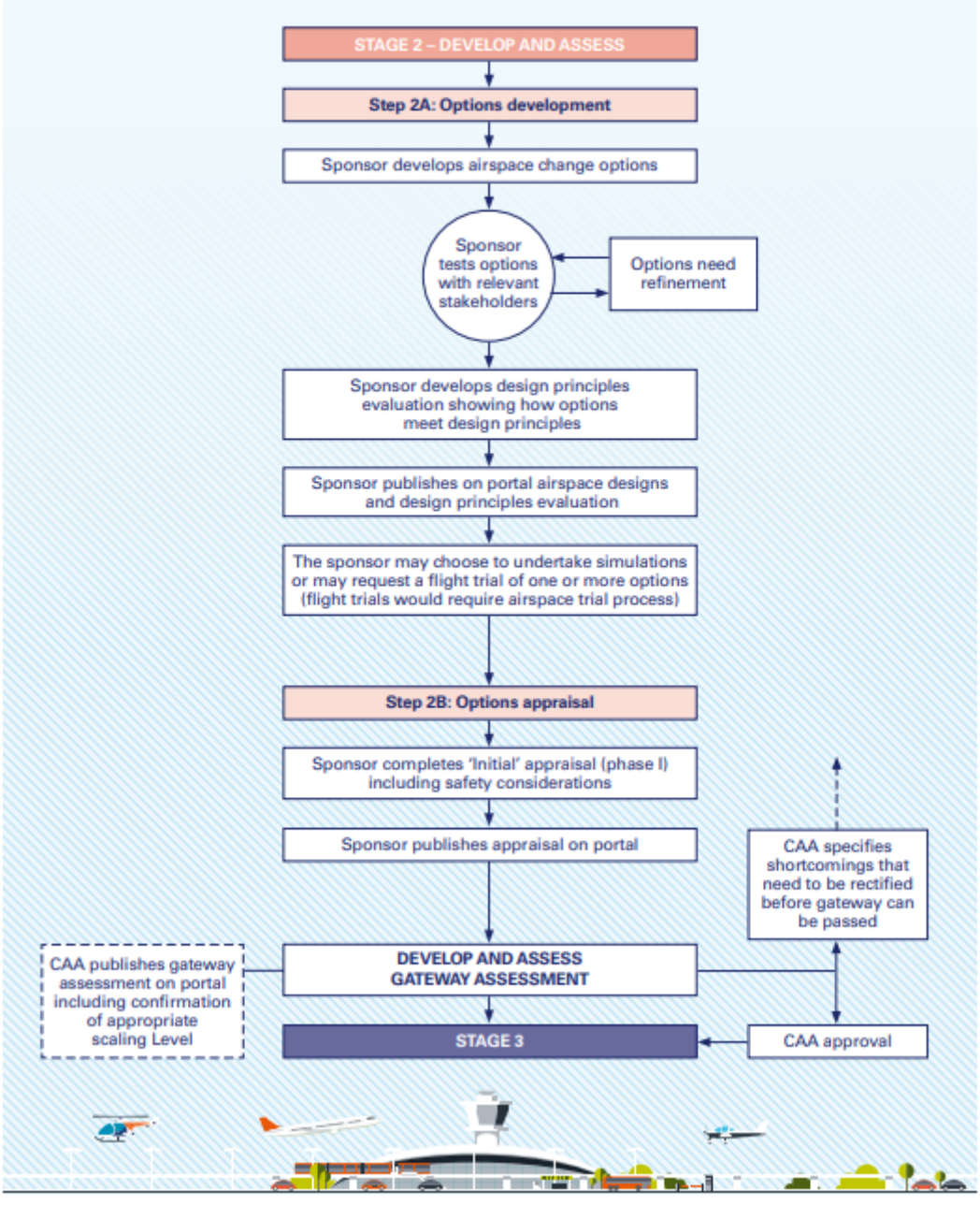
Operational (core)	DP6	Collaborate with other Scottish airports and NATS to ensure that the airspace design options are compatible with the wider programme of lower altitude and network airspace changes and accords with the CAA's published Airspace Modernisation Strategy (CAP 1711) and any current or future plans associated with it.
Health and wellbeing	DP7	Flight paths should be designed to minimise the total adverse effect on health and quality of life created by aircraft noise and emissions.
Health and wellbeing	DP8	For flightpaths at or above 4,000ft to below 7,000ft, the environmental priority should continue to be minimising the impact of aviation noise in a manner consistent with the government's overall policy on aviation noise, unless this would disproportionately increase CO_2 emissions.
Health and wellbeing	DP9	Flight paths should be designed to minimise population overflown below 4,000ft and, between 4,000ft and 7,000ft, taking into account any potential adverse impact, due to those overflown having protected characteristics, as defined by the Equalities Act 2010.
Health and wellbeing	DP10	Flight paths should be designed to minimise overflying sensitive locations and noise-sensitive receptors (for example, the zoo, retirement complexes, green spaces, historic heritage sites, and others).
Health and wellbeing	DP11	Flight paths should be designed to include track concentration and/or track dispersal options to provide noise respite.
Operational	DP12	Flight paths should be designed with routes that minimise track miles and fuel burn.
Operational	DP13	Flight paths should be designed to ensure efficient and effective route management.
Technical	DP14	Requirements of airspace users should be taken into account when designing flight paths.
Environment	DP15	Flight paths should be designed to minimise adverse local air quality impacts.
Economy	DP16	Airspace should be designed to maximise capacity in order to contribute economic benefits to Scotland, including tourism and trade.

Stage 1 "Define" was all about submitting the Statement of Need which is in effect a description of the requirements and aims of the airspace change programme and then the development of design principles through engagement with stakeholders and these are detailed above. The only change to these from our submission in March 2020 (Stage 1 gateway) and our approval in July 2021 was the rewording of design Principle 6 which now requires us to work with other Scottish Airports and NATS in accordance with the CAA's published airspace modernisation strategy. This is an approach that we continue to take and we are also about to work with Glasgow and NERL on a collaborative approach in refining our options. A final point to make is our ACP was paused after submission in March 2020 because of the Covid pandemic. We gained approval from the CAA to restart in May 2021 and subsequently updated our documentation with a resubmission in June 2021, passing through the Stage 1 gateway in July 2021.

Stage 2 Develop and Assess

Stage 2

Develop and assess



(CAP 1616 Page 45)

"At the beginning of Stage 2 of the ACP the change sponsor develops a comprehensive list of options that address the Statement of Need and align with the design principles from Stage One. The

purpose of engagement in Stage 2 is for key stakeholders who were already involved in Stage 1B to ensure that the design options do align with the design principles and that the change sponsor has understood and accounted for stakeholder concerns specifically related to the design options."

Stage 2A - Options Development

Our options development is described in the master document accompanying this submission. We looked at multiple SIDs, early turns after departure and a reduction in departure interval to enable the capacity value that we required We also needed to be aware of our SID exit points at TALLA, GOSAM and GRICE and working with NERL if we wanted these to be moved in order to accommodate any change in SID structure. Other points to consider were the holds at STIRA and TARTN for arriving traffic and also the case of population centres at Cramond and the City of Edinburgh if we were to minimise the number of people overflown and be aware of the effect of the environmental design principles. Our initial designs we described at a high level and the thinking behind them can be seen throughout the engagement presentation at Annex A. We discussed 3 or 4 SIDs and where they would be as well as having arrival options described in the initial engagement sessions. We needed to develop the swathes by applying the route from the runway to the SID exit point, and all options between. The best way to do this was to look at the distance flown and develop the swathes with regard to track miles flown. Other environmental design principles would be applied later in the process when we needed more specific analysis. We also looked at the constraints of the current controlled airspace and included any expansion required to accommodate further options. These included the straightening of the GRICE SID, the systemisation of Rwy24 arrivals from the North and also the development of a departure and rival route to the East (over the North Sea).

Stage 2 Stakeholder engagement: Engagement strategy

Stakeholder identification review

When we passed through the Stage 1 Define gateway the ACP project team held a stakeholder identification and stage 1 participation review. We asked ourselves if there were any people or organisations that should be included in further engagement that have not been so far and we were not aware of any. We asked ourselves if there was greater interest or involvement than we anticipated from certain people/groups and there was. We had to make changes to our original engagement plan to allow for greater involvement from Edinburgh Airport noise Advisory board (EANAB) in the Stage 1 process. This involves regular meetings with them and monthly updates on our progress. We also received extra communication from the Light Aircraft Association (LAA) and a number of communities expressing further concern regarding the airspace change programme. The issues raised were noted and assurance given that the design principles did cover the points that both general aviation and the concerned communities were raising, specifically the requirements of airspace users and whether schools could be considered as sensitive areas to be overflown. These specific issues would be discussed in Stage 2 engagement and Stage 3 consultation.

Based on our lessons learned during stakeholder involvement in stage 1 engagement, we reviewed the stakeholder lists to ensure that communities and stakeholders are provided with an appropriate opportunity to be involved. Our Stage 2 stakeholders were be based on those used at the beginning of stage 1 with some testing beforehand of our engagement material in order to check that what we are endeavouring to explain is understandable. We already have regular discussions with Air Navigation Services Limited (ANSL) our Air Traffic Control provider, EANAB., airline representatives and NERL (National Air Traffic services who provide en-route ATC at Prestwick Centre).

Objectives

The objectives of this Engagement Plan for CAP1616's Stage 2: Develop and Assess, were to:

- clearly evidence how Design Options are aligned with the design principles and evidence that stakeholder feedback, specifically relating to the Design Options, has been properly understood and considered, and a full explanation of the outcome of that consideration provided.
- preliminarily test these Design Options with the same stakeholders we engaged with in Stage 1, Step 1B.
- prepare for the Stage 2: Develop and Assess Gateway submission.

Options Development

From the design principles, we applied criteria to the development and assessment of the Design Options. These were based on the design principles and could be easily justified and evidenced:

- How will we explain how the design option relates to the design principle?
    - The first engagement session included the list of Design principles and how they were applied. The second engagement session included more information on the environmental design principles as well as a presentation on these which was made available in the virtual engagement portal.
- If RAG what is the rationale for RAG?
    - The rationale for RAG is contained in Appendix E of the CAP1616, this is the way the CAA want the outcomes presented. It is a simple traffic light option for presenting the conclusions of how each option performs against the criteria.
- What is the level of evidence needed, are the sources independent and reliable?

- For Stage 2 the evidence is qualitative as described in Appendix E of CAP1616 and comes from discussions amongst experts as well as stakeholders.

- Did we include the 'local authority plans' and the status of the plans (draft/complete etc)
  - WSP provided this information in the virtual engagement portal.

We will determine what is classified as an 'option':

- What is minimum requirement in CAP1616 ?
  - Options are not defined in CAP1616 and will vary with each ACP. They could vary from being a volume of airspace, to a straight line on an approach to a runway. Our process involves "swathes" that include the possibility of flight paths when taking into account the ACP drivers and DPs. We will present swathes inclusive of all possible options and explain how these swathes will be used to determine possible flight paths through options appraisal. Our departure options contained a number of SIDs and how these interacted against each other as this would give us a capacity figure.
- Options were presented that were different from previous consultations as the CAP 1616 process is very different from the CAP 725 process.
  - Stakeholders have been involved in the formulation of design principles and were also involved in giving feedback on whether our design principles have been applied correctly to our long list of options. Lessons have been learned from previous consultations and their involvement in the CAP 1616 began at an earlier stage and will continue through to public consultation making the whole ACP project more transparent than CAP725.
- Is an option just one flight path or is it a combination of the full picture of flight path options (i.e. dependencies etc)
  - In the long list an option is a swathe within which a number of flight paths will exist. An iterative process of options appraisal will be followed to decide which options will be taken forward to public consultation. The options were fully explained in the engagement sessions and the explanation as to which options have been chosen is contained in the Design Principle evaluation document. The full options appraisal will take place at the beginning of Stage 3 in order to choose the best solution when referring back to the statement of need but also applying the design principles throughout the process. The aim is to achieve the best solution for the sponsor and stakeholders at the end of the process.

A comprehensive list of Design Options that addresses the Statement of Need and aligns with the Design Principles and criteria was presented in the second engagement sessions.

Creating a draft comprehensive long list of options

Our technical workstream have created options that reflect the most efficient and modern airspace design (draft comprehensive long list) that will get us to the theoretical maximum departure capacity for Edinburgh Airport based on schedule demand and the different aircraft types. These options contain what we think is the best technical solution to meet the efficiency and modernisation requirements of the SON.

Internal workshops were held with technical and environmental experts to determine the guidance to be overlaid onto the draft comprehensive long list which will include and is not limited to Air Navigation Guidance, as well as the criteria derived from the design principles.

The technical workstream overlayed the agreed criteria onto the draft long list and through evaluation using the determined criteria, produced a final long list of options. The technical workstream demonstrated how the comprehensive list of Design Options criteria has been applied and how they are aligned with the SON and design principles. The technical workstream then conducted a design principle evaluation to show how the designs have responded to the design principles.

Stakeholders were engaged with at an early stage to test how we have determined our final comprehensive long list. To ensure continuity of the programme and in line with CAP1616, we engaged with the same stakeholders in Stage1, Step 1B.

Approach to stakeholder engagement

To achieve wide engagement throughout this process, we will conducted a number of [engagement] activities:

- workshops with stakeholders involved in previous engagement in Stage 1, Step 1B (including 'must includes')
    - Now a virtual platform but with further engagement sessions once the virtual platform was no longer available.
- Interdependency meetings.
    - GLA and NERL already commenced

Stakeholder engagement sessions

To ensure that people involved in the process at Stage 2 are briefed throughout the process, we engaged with the same recall workshop participants (same organisation, not necessarily same people) where possible, to attend the online engagement sessions for Step 2A. The reasoning behind this was to use the understanding the stakeholders have about the process and design principles to good effect, in that we will probably need to refresh the detail to the point we have reached, but not explain the whole process from the beginning.

We :

- ran online engagement sessions hosted by the technical adviser (now Head of Airspace) who has been heavily involved in conducted the design optioneering work (supported by environmental and technical experts) to discuss the application of design principles to the design options.
- provide pre-reading stimulus (see virtual engagement contents) and terms of reference for engagement to ensure that participants fully understand the process within which they are participating, and the necessary outcomes of this engagement.
- The long list of options will consist of swathes that are constructed using the design principles to encapsulate all flight path possibilities. Only through options appraisal (against all 16 DP's) will these swathes be reduced in size to encapsulate the mini-swathes or flight paths that we take forward in the process.

We asked our key stakeholders:

- Do you understand the process we followed to determine our comprehensive long list of design options?
- Do you think this comprehensive long list of design options is reflective of the DPs criteria?
- If you think they do not meet the design principles, why not?

These questions will be asked at the online engagement sessions. The purpose of the virtual engagement platform was to allow stakeholders the time to look at all relevant material to give considered feedback in response to the material presented. (Annex E).

Feedback

We documented the feedback from the interdependency meetings and online engagement sessions to ensure all comments were captured in the engagement process. This feedback informed participating stakeholders about the insight we have used to develop the initial options appraisal.

We ran further internal workshops to evaluate overall feedback on the Design Options and we made amendments based on this feedback. We justified why Design Options remain valid, have changed or are no longer valid. This again is thoroughly documented and explained in the Design Principle evaluation and the Initial options Appraisal.

We will then close the feedback loop and provide feedback to participants on acknowledgement, gratitude, what was said, process and outcome; and what is next in the process. This will be through our Stage 2 submission and subsequent meetings.

Interdependency Meetings

Conduct interdependency meetings to identify any critical dependencies and establish plans to resolve any issues that arise from these dependencies with other airspace controlling authorities. These interdependency meetings are now ongoing and include:

- NERL (National air traffic services En-Route Limited)
- Glasgow Airport
- Airspace Change Organisation Group (ACOG)
- Air Navigation Services Limited (ANSL our Air Traffic Control provider)

Documentation

CAP1616 requires us to publish our comprehensive list of Design Options at Stage 2, Step 2A. To ensure that there is context around the comprehensive list and the design criteria evaluation. This comprehensive list of options will addresses the Statement of Need and aligns with the Design Principles from Stage 1. Further engagement will take place to explain the application of the design principles against the comprehensive list of options and the process of how the design principles will be used to evaluate these options before Stage 2B and the options appraisal.

Stage 2 Engagement

An initial options appraisal took place at Stage 2, Step 2B in accordance with the requirements of CAP1616.

Each of the options identified in Step 2A was assessed to highlight the positive and negative impacts, which also included the scenario of doing nothing. The appraisal was objective, repeatable and consistent against defined criteria. Information was made available in a virtual platform that included a presentation guiding stakeholders through the work required to produce understandable options. Explanations of the whole CAP1616 process was also included along with the requirements of Stage 2 and how the design principles have been applied to achieve our goal of viable options for flight paths. This virtual platform also contained charts, documentation and a section on FAQs. An advantage of this platform is that we could make it accessible to a tailored audience, collect data on the number of visits and give stakeholders the time to think about the aims of the engagement process. i.e. have we applied the design principles correctly to a long list of options?

Using feedback from the virtual process there were further online engagement sessions to offer more detail to key stakeholders, This enabled them to look at our design options and offer more feedback on our processes of applying our design principles to them. There are 16 design principles, a comprehensive list of options and then a long list of options to describe and using an iterative process, we ran engagement sessions covering the comprehensive list of options and then the long list of options. Running these separately gives an opportunity for understanding and feedback which may not be forthcoming in a long and complicated session. This was understandably be the case for key stakeholders from a non-aviation background and their understanding of the process and our ideas is most valuable as we look to refine and appraise our options.

The options appraisal commences with what is in effect a blank sheet of paper, however this is constrained by runway orientation and exit points (for departing traffic). Criteria are then applied such as the earliest point an aircraft could turn once airborne, the direction of turn and the aircraft type. Considerations are also given to obstacle clearance, the environment, sensitive sites (?) population centres and capacity issues (this list is not exhaustive), to decide whether options remain feasible or should be rejected. Using this methodology will present a number of feasible options to develop in further appraisals. This list of options will include a description of the change proposal, an indicator of the likely noise impacts and a high level assessment of other costs and benefits involved. Step 2B does not require further engagement but we will inform our stakeholders when our submission is available to view on the portal.

Following the CAP1616 process a full options appraisal will take place at Step 3A with a final appraisal at Step 4A.

Evidence compiled for the Stage 2 gateway assessment

- A list of stakeholders engaged in these Stage 2 engagement sessions
- An explanation of the engagement methods used, for example, the virtual platform, workshops and the engagement process.(including dates, times, attendees, venue), utilised to test the Design Options with all stakeholders.
- Evidence of the engagement activity showing a two-way conversation (including links/references to the raw correspondence i.e. issued/received and any engagement materials used and provided) is provided in the Annexes and transcripts
- Stakeholder Engagement Activity Log (dates, events, topics discussed, minutes and presentations)

- An explanation of the issues raised during the engagement process, i.e. evidence that sponsors explained to stakeholders why there would only be limited Design Options (where it is the case).

Virtual Workshop content

Explanatory videos:

- **CAP1616 and Stage 2 in particular**
- **The aims of the engagement and the feedback required including design principles and criteria**
- **Airspace modernisation and PBN**
- **Capacity constraints**

Presentations:

- **The story of Stage 2. SoN requirements through to the longlist (swathes) including the main drivers of the ACP**
- **How the longlist of swathes will be developed into preferred options.**
- **Methods of achieving departure separation**
- **Capacity and its achievement through SIDs**

Documentation and charts:

- **Maps used for assessments**
- **FAQs**
- **Links to AMS, CAP 1616, PBN and other relevant CAA published documentation.**
- **Link to the CAA ACP Portal**
- **Design principles and criteria**

A Summary of the engagement required CAP 1616 Appendix C

"Effective engagement is important to both parties. We are required to design options that meet the principles developed in Stage1B. We must seek feedback from key stakeholders to test our hypotheses. Bilateral meetings and smaller challenge groups are likely to be sufficient to ensure that stakeholder concerns have been properly understood and accounted for in designing options."

In Conclusion:

It was important to link engagement responses to options and explain how options have been influenced. The building blocks for options are detailed in the document submission and all of this documentation is consistent as we are moving through the process, describing design options and how they have been influenced by the design principles. The purpose of this Stage 2 engagement was to extract feedback on whether the design principles have been correctly applied to the longlist of options and also to give further information on the criteria and methodology used in the application of our design principles. We also provide a brief explanation of the next stage of the process and how we will move to a full options appraisal in the latter part of the engagement sessions.

Stage 2 : Phase one of engagement This was engagement was carried out using two presentations to stakeholders invited to engagement sessions as detailed in Annex's A and B of this document. Continual updates are also given on the progress of our Airspace change at meetings of our Flight Ops and Safety Committee (FLOPSC), our Noise board and associated subgroups and there have also been further engagement and update meetings with a group of Cramond residents, Transport Scotland, local politicians and members of the General Aviation Community. Most of this engagement has been necessarily in the format of Teams meetings however we were able to hold the final in a series of engagement meetings as a hybrid, with stakeholders able to turn up in person if they wished. This engagement is ongoing and will continue through the process up until our public consultation in Stage 3.

Our first presentation detailed our participation in the masterplan of the UK's airspace modernisation strategy the drivers for our airspace change, our design principles, a high-level look at our departure options and also the possibilities we have for our arrivals.

Phase one engagement stakeholder feedback

This was generally positive with more detail requested and indeed required on the environmental design principles hence the second engagement sessions. The Firth of Forth option was described and there was some issue with the fact that we want to operate this SID from both runways and also want arrivals from this direction to both runways. This was explained further in the second engagement session along with any possible requirements for additional controlled airspace.

Refining the design envelopes and creating route options

We looked at swathes and arrows. The second engagement included arrows that indicated turn directions but were obviously not flightpaths. This was for two reasons. Importantly we did not want our stakeholders to think that we had already decided on flightpaths so illustrated possible flightpaths with broken arrows. We also included the direction of turn and whether this would be an early or late turns. Earlier turns from departure tend to be made at a lower level and so have far greater adverse effects on local populations. Later and therefore higher turns would always be preferable form an environmental (aircraft noise) point of view. We also indicated in this presentation whether our capacity goals had been met as well as if any of these options presented airspace difficulties.

Phase two of engagement

Our second engagement sessions included all of our departure and arrival options. An update on capacity requirements and information about environmental assessment. This presentation mentioned possible requirements for additional controlled airspace and also gave more detail on how we would apply our environmental design principles to these options. Feedback was given throughout the presentation with the opportunity to ask questions and there was also feedback streams from emails and forms with the presentation distributed to all attending stakeholders. Finally to confirm that the presentation for phase 2 is at Annex B.

Generation of Route options and describing the route options

The engagement at this stage is for stakeholder feedback to be applied to our design options and there follows a summary of how we think we achieved this after our engagement sessions and feedback.

Phase 2 stakeholder feedback

Category	Number	Design principle
Safety (core)	FDP1	The airspace design and its operation must be as safe or safer than it is today.
All of our departure and arrival options will be designed to be safe. No options have made the Design Principle Evaluation that are considered unsafe as they would not make the short list. Systemisation increases resilience		
Safety (core)	FDP2	Flight paths must be flyable and technically supported by air traffic control and airport technical management systems.
Flight paths will be compatible with current systems, and this will be tested before implementation.		
Operational (core)	FDP3	Flight paths must be designed to allow modern aircraft to use performance-based navigation (PBN) in line with CAA's modernisation strategy
All options will be designed as PBN and therefore comply with the CAA's modernisation strategy		
Operational (core)	FDP4	Routes to/from Glasgow and Edinburgh airports must be procedurally deconflicted from the ground to a preferred level in coordination with NATS Prestwick.
We work continually with Glasgow and NATS Prestwick. We do not believe that our routes below 7000 feet conflict with Glasgow's but in the network above 7000 feet there may be changes and these are the subject of simulator sessions later this year. Our options allow for adjustments to SID exit points hence their representation by swathes.		
Operational (core)	FDP5	The predictability of flight tracks must be maximised for consistency of operations.
As our SIDs are PBN they will be predictable and indeed have accuracy.		
Operational (core)	FDP6	Collaborate with other Scottish airports and NATS to ensure that the airspace design options are compatible with the wider programme of lower altitude and network airspace changes and accords with the CAA's published Airspace Modernisation Strategy (CAP 1711) and any current or future plans associated with it.
We continue to work with Glasgow, and NATS as part of the Scottish cluster of airports who will implement their ACPs at the same time.		
Health and wellbeing	FDP7	Flight paths should be designed to minimise the total adverse effect on health and quality of life created by aircraft noise and emissions.
There will be more analysis in Stage 3 but we hope to achieve this by minimising populations overflow, traffic distribution and utilising areas of low or nil population in our designs. These areas include the Firth of Forth and the M8 corridor. The efforts we make to avoid Cramond, and the City of Edinburgh are part of this.		
Health and wellbeing	FDP8	For flightpaths at or above 4,000ft to below 7,000ft, the environmental priority should continue to be minimising the impact of aviation noise in a manner consistent with the government's overall policy on aviation noise, unless this would disproportionately increase CO_2 emissions.
This DP only applies between 4000feet and 7000feet. Our SIDs would consider noise effect up to 7000 feet and the only option for perhaps turning them below 7000 feet may present itself on the EAST SID or TALLA SID from Runway06.		
Health and wellbeing	FDP9	Flight paths should be designed to minimise population overflown below 4,000ft and, between 4,000ft and 7,000ft, taking into account

		any potential adverse impact, due to those overflown having protected characteristics, as defined by the Equalities Act 2010.
We take this as meaning up to 7000feet and again this is about minimising population overflown as we feel people with protected characteristics would be widely dispersed throughout the general population. We would be aware of any special schools or institutions where a number of people with protected characteristics may be concentrated in a particular area and need to bear this in mind.		
Health and wellbeing	FDP10	Flight paths should be designed to minimise overflying sensitive locations and noise-sensitive receptors (for example, the zoo, retirement complexes, green spaces, historic heritage sites, and others).
We have maps and will use local knowledge to avoid overflying sensitive locations. Once we have our flight paths in Stage 3 we will do a sense check with detailed maps and community representatives.		
Health and wellbeing	FDP11	Flight paths should be designed to include track concentration and/or track dispersal options to provide noise respite.
We intend to meet this design principle by possibly operating our quietest SIDs during the night and also respite by design. Using the M8 corridor and the Firth of Forth. Dispersal is achieved with the vectoring of arrivals and designing systemised arrivals with population centres in mind.		
Operational	FDP12	Flight paths should be designed with routes that minimise track miles and fuel burn.
Aircraft Noise is the environmental consideration below 7000 feet, however if there is an opportunity to reduce the effect of noise and track miles coincidentally, we shall take this. We anticipate en-route track mile reduction with the introduction of the EAST SID and also with a possible truncation of the GOSAM SID.		
Operational	FDP13	Flight paths should be designed to ensure efficient and effective route management.
We intend to introduce the most efficient flightpaths after noise considerations and PBN allows more accurate flight planning opportunities. We also need to continue to provide the opportunity for Continuous Climb Operations and Continuous Descent Operations allowing aircraft to operate in their most efficient mode.		
Technical	FDP14	Requirements of airspace users should be taken into account when designing flight paths.
We have identified areas where we would like to implement additional controlled airspace to design more efficient operations. These are to the north of the airport to facilitate a straightening of the GRICE SID, and also to facilitate systemisation of Rwy24 arrivals from STIRA. We would also need a stepped airway to the East to facilitate the EAST SID from Rwy06 and arrivals to Rwy24 from the East. We are well aware of the airfields to the north of the ScTMA and would need to build a robust case to justify any implementation of new controlled airspace to the north. We are also well aware of Kirknewton and intend to allow their operation to continue as it currently does. Once we have our flightpaths, we would look at any controlled airspace volume reduction that we could achieve.		
Environment	FDP15	Flight paths should be designed to minimise adverse local air quality impacts.
Local air quality is measured below 1000 feet. We would minimise this by a reduction of delays on the grounds and also keeping early turns below 1000feet to a minimum.		
Economy	FDP16	Airspace should be designed to maximise capacity in order to contribute economic benefits to Scotland, including tourism and trade.

We will achieve this by designing a capacity for our controlled airspace that would allow for the forecast increase in traffic to operate safely and when they required.

Conclusion

This summary of ideas against the design principles answers many of the questions put forward during engagement and of course there are many more questions and answers contained in the text.

Our short list of options includes the modernised baseline for departures and arrivals, and we have included options that meet our needs for modernisation and capacity, whilst at the same time bringing what we think are the maximum environmental benefits. We are looking to prove (through a safety assessment) that the departure interval being reduced from 2 minutes to 1.5 minutes will meet our capacity requirements and therefore we would not need to implement a SID with an early turn and the environmental issues that would bring. However, if we cannot prove that this reduction in departure interval is safe then we are taking forward departure options that include early turns to give us the required capacity.

Our arrival options contain vectoring and systemisation which is what our ANSP is requesting as a preferred option. We would design approach transition from the arrival holds to final approach and these would also be compliant with the 16 design principles.

More detail on out long list of options and how these have been reduced to our shortlist of options can be found in the Design Principle Evaluation document that accompanies this submission.

Further analysis especially environmentally can be found in the Initial Options Appraisal documentation that also accompanies this submission.

Next Steps – Stage 3 and Refining the route options

When Stage 3 commences, we will need to look at a data-based construction of the flightpaths for our SIDs and also determine where our approach transitions can be designed. We will follow the process detailed in Appendix B of the CAP1616 which clarifies the need to use the most up to date, credible and clearly referenced sources of data with modelling carried out in line with best practice.

A full options appraisal will be carried out on our options and our consultation material will be prepared before the consult gateway in July 2023. Also, for comparison our future flightpaths will be compared against the current baseline so that improvements can be clearly seen and explained to our consultees.

As we progress through Stage 3 we will have further meetings with our stakeholders and look to incorporate ideas into our design that give the maximum benefit and best solution.

Once we have our flightpaths for consultation, we intend to look at our volumes of controlled airspace and see if we can reduce these in accordance with Design Principle 14 where we take account of the needs of other airspace users. We intend for the airspace to remain Class D and would expect national regulation and guidance to be continued to be applied with no change in this classification. As sponsor we are designing flightpaths specifically for the airport's needs and the aircraft that operate here, however we are aware of the needs of other airspace users and will continue to assess our guidelines for drone operators and airspace crossers (for example).

Stakeholder Identification

Stakeholders were identified from previous workshops held during Stage 1 and as Stage 2 is a collaborative approach with the aid of the Airspace Change Organising Group (ACOG) we had regular engagement with NERL and Glasgow to provide the best solution possible. Attendees of our FLOPSC meeting were included as was Edinburgh Airport's Noise Advisory Board sub-group as well as ANSL our ANSP, local planning organisations, representatives from local airspace user groups. We also included NATMAC representatives and wanted to invite a wide spectrum of interested parties to be involved as we progress through the process and choose the best options that provide the best solution with regard to our statement of need.

The full list of stakeholders is included below.

FLOPSC

[redacted]	DLH
[redacted]	signature
[redacted]	easyJet
[redacted]	jet2
[redacted]	WFS
[redacted]	WFS
[redacted]	Stobart aviation
[redacted]	BAA
[redacted]	BAA
[redacted]	Loganair
[redacted]	easyJet
[redacted]	jet2
[redacted]	BAA
[redacted]	Qatar airways
[redacted]	Westatlantic
[redacted]	Ryanair.com
[redacted]	Emirates
[redacted]	BAA

EACC

[redacted]	EACC
[redacted]	EACC
[redacted]	EACC

NATMAC

GATCO	[redacted]	[redacted]
LAA	[redacted]	[redacted]
	[redacted]	
	[redacted]	
BGA	[redacted]	
Drones - BALPA	[redacted]	

NATMAC GASCO	[redacted]	
RPAS	[redacted]	[redacted]
Systemwise	[redacted]	[redacted]
HIAL	[redacted]	[redacted]
HIAL	[redacted]	[redacted]
GATCO	[redacted]	[redacted]
F9	[redacted]	[redacted]
SRUC	[redacted]	[redacted]
Prestwick Airport	[redacted]	[redacted]
Kirknewton	[redacted]	[redacted]

FOCUS GROUP

Focus group	[redacted]	EANAB
	[redacted]	EANAB
	[redacted]	EANAB
	[redacted]	EANAB
	[redacted]	EANAB
	[redacted]	EANAB
	[redacted]	EANAB
	[redacted]	EANAB
	[redacted]	Fife council
	[redacted]	Burntisland community council
	[redacted]	Scottish handgliding and paragliding
	[redacted]	RNIB
	[redacted]	BUTA
	[redacted]	EP Scotland
	[redacted]	Airspace4all
	[redacted]	PPCA
	[redacted]	Gliding
	[redacted]	Cramond and Barnton Community Council

ATC

ANSL Edinburgh's ANSP	
Sandy Legget	[redacted]
Tony Kirkbright	[redacted]
Vicky Hughes	[redacted]
NERL	
MORRIS, Laura J	[redacted]
GOOCH, Nicholas I	[redacted]
COTTER, Nicholas M	[redacted]
RUTLIDGE, Ryan H	[redacted]

DARE, Christopher J	[redacted]
ELTON, Philip G	[redacted]
GLASGOW and Aberdeen	
Fiona Smith	[redacted]
Kel Kirkland	[redacted]
John Henderson	[redacted]
Kim Hamilton	[redacted]
Chris Myers	[redacted]
	[redacted]

Additional

[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]

Engagement Record Stage 2 This engagement record is for Edinburgh specific engagement and feedback only. The Options development document includes further detail on engagement and internal workshops.

Date	Stakeholder	Duration	Purpose
5 May 2021	EANAB	2 hours	Stage 1 and 2 ACP update
2 June 2021	EANAB	2 hours	Stage 1 and 2 update
16 June 2021	EDI / NERL	1 hour	Structure briefing
12 July 2021	FLOPSC	2 Hours	ACP update
4 August 2021	EANAB	2 hours	ACP update
12 August 2021	EANAB Aviation SG	1.5 hours	ACP Update
6 September 2021	EDI/GLA	2 hours	GA briefing coordination
9 September 2021	EDI/GLA	2.5 hours	GA briefing
13 September 2021	FLOPSC	2 hours	ACP Update
29 September 2021	EANAB Aviation SG	1 hour	ACP update
06 October 2021	EANAB	2 hours	ACP catch up
21 October 2021	EANAB Aviation SG	1.5 hours	ACP update
5 November 2021	EDI/GLA/ACOG	3 hours	Show and tell options
8 November 2021	FLOPSC	2 hours	ACP update
1 December 2021	EANAB	2 hours	ACP catch up
16 December 2021	EANAB SG	1.5 hours	ACP Update
5 January 2022	EANAB	2 hours	ACP catch up
6 January 2022	Airlines	0.5 hours	Requirements
10 January 2022	FLOPSC - NERL	2 hours	ACP catch up
14 January 2022	CAA	1 hour	ACP update
17 January 2022	NERL	0.5 hours	BGA engagement prep
21 January 2022	ACOG	0.5 hours	Catch up
8 February 2022	NERL – BGA	1.5 hours	Engagement
14 February 2022	EANAB SG	1.5 hours	ACP Catch up
23 February 2022	Stakeholders	2 hours	Engagement
1 March 2022	Stakeholders	2 hours	Engagement
2 March 2022	Cramond	1 hour	Briefing
14 March 2022	FLOPSC	2 hours	ACP Update
15 March 2022	ScTMA group + ACOG	1.5 hours	Coordination group
16 March 2022	NERL	1 hour	Time bound SIDs
21 March 2022	EANAB SG	1.5 hours	ACP catch up
29 April 2022	EANAB SG	1.5 hours	ACP catch up
20 May 2022	EANAB SG	1.5 hours	ACP catch up
24 May 2022	Stakeholders	2 hours	Engagement
30 May 2022	Stakeholders	2 hours	Engagement
9 June 2022	Stakeholders	2 hours	Engagement
14 June 2022	Politicians	1 hour	ACP Update
16 June 2022	Transport Scotland	1 hour	ACP update
24 June 2022	Cramond	1 hour	Possible solution
6 July 2022	EANAB	2 hours	Monthly update
8 July 2022	EANAB SG	2 hours	ACP catch up
11 July 2022	FLOPSC	2 hours	ACP update

Engagement Session 1

(2 online sessions with the same presentation. See Annex A)

Engagement Session 1 took place on the 23rd February 2022 and also a second session with the same presentation on the 1st March 2022.

Transcript from the session on the 23rd February 2022.

Confirmation that the slides were showing.

Welcome and thanks for coming and hopefully this is informative and there will be plenty of time for questions. Please take notes and this is the first session of two. This will inform you of where we currently are in the process and where we are going with it. This presentation is not the whole thing and is outlining our options development and testing them with you.

We are in the CAP 1616 process and have passed through Stage One which incorporated our Statement of need and where our design principles have been approved and we are now in Stage 2A of the process and options development.

The first slide is about the masterplan iteration 2 and we are working with Glasgow and Prestwick Centre who work all of our network traffic. This is something we need to adhere to. Complying with Stage 2 means that we can submit our Stage 2 submission at our particular gateway. This document means we are moving together so when we come to implement our airspace change, we do this together which makes sense for the network. The masterplan identifies interdependencies which we may or may not have with Glasgow. We need to work together to come up with solutions.

In CAP1616 we need to develop one or more options that address our Statement of need and identify all possible route options. This presentation is about these design principles. Have we identified all of these options and have our design principles been applied correctly which is where we gather feedback from our participants on this call. I'll talk about our design principles later on. Not all of them and there will be a second presentation in late April. This presentation will be given again on March 1st.

The drivers for our airspace change are modernisation, precision-based navigation, meaning aircraft can fly between different points instead of using beacons on the ground. Aircraft are already equipped for this, and we are designing flightpaths for them to use. A benefit is that the beacons on the ground will not need to be replaced and these new flight paths could increase capacity which is another driver for our ACP. What we are trying to do is reduce delays on the ground, reduce delays in the network and increase runway throughput so that we operate more efficiently. We will also try to reduce our environmental impact by overflying less people and reducing the noise impact. There are one or two obvious changes we can make to achieve this.

Currently our flight paths are based on beacons, for example at Glasgow and Turnberry, and these are coming to the end of their operational life, so we need a replacement. We will introduce RNAV routes (area navigation) and use Satellite navigation which you may be familiar with in your car. We will use these routes to systemise the airspace which reduce ATCO workload, it concentrates aircraft on routes to make flightpaths more predictable. We are also preparing to reduce future delays including at first wave, which involves increasing runway capacity. What we could do is reduce the time interval between departing aircraft. Currently all aircraft depart 2 minutes apart which gives a maximum declared rate of 30 (actually 28) departures per hour but what we would like to do is

increase this to 40. This will give less delay on the ground and increase capacity. We also want to minimise environmental impacts so reduce the number of people overflown, when and how often they are overflown and in the end the question is where do we draw the route? This is where emotion comes into this, but nothing is decided. This is a high-level introduction as to where we are going with our options. We need to balance modernisation, with capacity and reducing environmental impact.

We have 16 design principles, and I shall try to describe each one.

The first six on the slide are our core design principles.

We must be safe or safer than today.

Flight paths must be flyable and fit in with the current system, and there is no reason why they shouldn't.

They will be designed as PBN flightpaths and fit in with the AMS.

We will work with Glasgow and NATS Prestwick to deconflict any of the design options. We work with NATS at Prestwick and attend numerous workshops to comply with this.

Precision based SIDs and possibly arrival routes will allow predictability and consistency of operation.

Collaboration with other Scottish Airports and NATS is taking place to allow for compatibility with the wider network. This DP 6 is the only one to have changed since we submitted at the beginning of the pandemic, and this was on the instruction of the CAA.

Our other design principles are not core but still very important.

We should minimise the total adverse effect on health and quality of life.

Flight paths should be designed to minimise the impact of aviation noise in such a manner consistent with the government's overall policy on aviation noise.

Flight paths should be designed to minimise population overflown below 4000ft and between 4000 and 7000 ft taking into account any potential impact due to those overflown having protected characteristics as defined by the equalities act. Protected characteristics are included in anti-discriminatory law and includes age, disability, sexual orientation to name 3 on the list. We shall do our best with this. An example may be the overflight of a special school.

Our flight paths will be designed to minimise overflying sensitive locations which include schools, special schools, retirement homes, care homes etc.

Respite and dispersal is an interesting principle and more will come in the second presentation.

Flight paths should minimise fuel burn so shortening the route is the obvious thing to do here is possible.

Efficient and effective route management should be taken into account which means the planned operation of a flight in the most efficient way. No delays and an efficient route structure.

Requirements of airspace users should be taken into account, which includes the GA community, such as light aircraft, gliders and microlights etc. More later in this presentation.

Also minimising air quality impacts applies to aircraft below 1000 feet and we would need to monitor this if the flight path changes. We could reduce delays on the ground which would improve air quality in that aircraft would not be held on the ground.

Finally, there is a design principle about increasing capacity and benefitting Scotland through tourism. One of our drivers is increased capacity.

We will now look at our current system and talk about departure options.

At the moment our system looked like the slide system/destinations. Actually, this is from pre-Covid times, and we will continually look to gather more current and prospective information as the recovery and forecasts change which they probably will do. I will update this situation in the next presentation as we gather more information.

Our current system has 3 SIDs. GOSAM to the west, GRICE to the North and TALLA to the south. By usage we have a south-west orientated runway and in 2018, 69% of our traffic used Rwy24 and 31% used Rwy06.

Each runway has a departure to the three exit points GOSAM, GRICE and TLA. The boundary of our Controlled Air Space (CAS) is the blue dotted line. Our arrival holds are at STIRA and TARTN with most arrivals via TARTN as most of our arrivals come from the south. We also have RAF Kirknewton in close proximity, Fire airport, Portmoak Gliding centre, Cumbernauld and Dundee to consider.

This is our route system as it looks overlayed on the map you can see GOSAM from both runways and about half of our traffic uses this SID. GRICE and TALLA both route towards population centres and I am sure that we can improve this situation.

This route structure allows for aircraft to depart with 2-minute intervals no matter what SID they are departing on.

This slide looks at some actual tracks and as you can see there is some dispersal with aircraft flying SIDs with different performance issues. This slide is to visualise the TUTUR trial and the route that it took. In the end this SID was not implemented but it's mentioned here as we may include this in our options, but we may not take it forward. Some further information is GOSAM is a jet only route with TALLA having a mix of traffic and only about 7% of traffic using GRICE which tends to be aircraft routing to other Scottish destinations. These figures will be updated as and when we can.

Optioneering of Routes

We have tried to include every option in this and would like your feedback.

The minimum we can do is look at the current situation and overlay them with an RNAV route which means the SID stays in exactly the same route but aircraft use RNAV to fly them more accurately.

Our next options are to use 3 exit points but improve the routes to take account of environmental options and our next option is to establish four exit points with one utilising an exit to the east.

At the moment we have 3 exit points from Rwy 24. We also have 3 from Rwy 06 but we take the GOSAM SID to the south so we would have to appraise this and see what the benefits may be.

This slide shows departure options with four exit points and the possibility of a departure to the east. Again, we have GRICE, GOSAM and TALLA with an option to the EAST from Rwy 24. If this was to be established, we would need to decide which turn (left or right) would be more appropriate for the EAST departure. Likewise, from Rwy06 the options include the EAST SID but this time we have a

decision to make about GOSAM routing to the South or North of the airfield. We work hard with NERL to try to get the EAST option we think that the EAST SID and further route over the North Sea is one of the most fuel saving in the UK.

Further options considered but ranked low because of trach miles would be a right turn from RWY24 to TALLA or a left turn from RWY06 to TALLA. These options would increase track miles, and so emissions and fuel consumption, they would consume airspace and perhaps be of no operational benefit.

Likewise, the left turn from Rwy24 to GRICE and the Right turn from Rwy06 to GRICE also increase track miles, and so emissions and fuel consumption, they would consume airspace and perhaps be of no operational benefit.

We also considered options for 3 exit points from Rwy 06 and 4 from Rwy 24 and likewise 3 exit points from Rwy 24 and 4 from Rwy06 but these have been discounted as capacity would not be in balance and the system would be overcomplicated. This would introduce the possibility of human factors errors and is not standard practice.

So, we move on to swathes for our departures. You can see Kirknewton, the TARTN hold and the boundary of CAS. Our SIDs would route somewhere in the relevant swathes. These swathes would include the relevant SID so the blue Swathe would contain the GOSAM SID, Green for TALLA, red for GRICE and Pink for EAST. The SIDs would be contained in these swathes as to route outside would introduce excessive track miles. We would keep our options inside these swathes and present further detail in the next session. Schematically this is simple, but this is where we believe our departure options lie. We have 3 or 4 SIDS and what we want to do is improve what we have at the moment. This would fit into the network above us, and any major change would probably involve a disproportionate amount of effort to achieve a similar result.

These maps are what we use to give us the best options. The airfield is as shown and the current SIDs are depicted on the map. What we could do with TALLA for instance is route further south along the Firth of Forth (FoF) and move away from the Fife coast. Likewise, we could improve the situation for GRICE traffic. These contours are where the aircraft would be for 2000ft, 4000ft and 7000 ft. These will be used to help us draw the mines and we will come back with more refined options.

This next slide is for Rwy 24 and the current SIDs are depicted. What we can see is that the routes go directly over Livingston to the west, and we may be able to improve this by routing aircraft along the M8 corridor where the population overflown would be much less. We are zooming in here, looking at population areas and seeing what improvements can be made. Our baseline overflies Livingston, but you can see options that would avoid the more populated areas.

For TALLA there are a lot on left turns. Some would overfly Kirknewton and only do this when they were not active. As you can see there are many options, and we may break this down into mini swathes to see which the best options are to take forward and this is our current thinking.

And this final one is for Rwy24 to GRICE. As you can see there are some less populated areas to fly over but this is subject to analysis and we need to look at all options, reducing swathes to mini swathes and eventually flight paths in Stage 3. We will continue to engage and want to take you with us at every stage of the process. This is our approach to what we are doing with departures and now for some actual tracks.

Aircraft departing Rwy06 for TALLA route up towards Kinghorn before turning, and also for GOSAM you can see the width of the turn (dispersal) which is quite marked, and we can try to do something

about this. Likewise for GRICE. What we are looking at, along with NERL is truncating the GOSAM SID so that aircraft can join the network earlier instead of planning the SID a long way towards GOSAM.

On Rwy 24 you can see the dispersal to the west, and you can see here the 10% spread to GRICE and the other denser tracks to the other SID exit points. Aircraft will be climbed on the SID and then turned once they are above 7000 feet.

I have one more slide to show before questions and a break.

This slide relates to design principle 14 and the responses we had from the GA community. You can see our CAS at the moment. On the right-hand side, you can see what the GA community would like and they say that existing CAS is structured around a closed runway, it is excessive compared to other airports and also areas to the North and South are underused. What we need to do is look at the dimensions of this when we have our flightpaths and see what we can do once our design is finalised. All our options have been included and we are going forward with 4 SIDs. What we are trying to do is get from the Runway to the exit point with the least track miles taking into account environmental issues such as noise. We also need to think about capacity. This is high level briefing about our departure options and how they align to our statement of need. We will go onto our arrival options after a break.

Any questions please ask.

[redacted] (airspace4all) Options for Rwy06 for wrap around. Have you considered at Brussels there is the city, and you can't fly over this. Take-off thrust to climb thrust has an effect on departure. Aircraft climb more steeply. Changing a climb profile can affect the environmental considerations.

Minimising people overflown is one of our design principles. We are trying to fly north of the city and along the coast in order to reduce the number of people overflown.

[redacted] LAA

Looking at the contours they seem to be variable where do you look at the aircraft performance and climb is maximised will affect less people on the ground. You said when discussing the same amount or different numbers of SIDs your comment was people make mistakes.

What I meant was standard practice is to have a SID from each end and an innovation a step too far. I meant the possibility for human factors issues. If we are flying on autopilot rather than manual maybe a Freudian slip. This is not standard practice, with feedback from airlines they would like a SID from both ends. The fuel saving is needed en-route.

Kirknewton is not a busy place, but it may be difficult to coordinate overflying if require when they are not active. This is only an option and may not be taken forward.

[redacted] (EANAB)

Support of Ian's point that we are keen on the Forth option and we would like this to be a single direction option. Innovation may be worth looking at. The argument against this is that the fuel saving is during the en-route part of the flight over the North Sea as opposed to locally below 7000ft.

[redacted] CUMBERNAULD AIRPORT

How do changes in the network affect track below 7000ft?

If the exit points move, then we need to keep our options open rather that route to a fixed point that may move. This is why when we submit there will be many options that include every possibility, so swathes would cover this possibility and not lines on a map. If we don't have specifics by the end of our Stage 2 process, we would take a swathe forward. Putting a line on a map could be embarrassing if we needed to come back to the option.

NERL are trying to make this efficient as well and this is a collaborative approach.

[redacted] (EANAB)

At what point will we see the noise sensitive areas?

The evidence base for this will be looked at in Stage 2 and 3 when the process.

[redacted] (WSP)

The maps have been developed to include noise sensitive areas and if there are others then we are happy to take these into account.

In the next engagement session, we would come back to look at these environmental design principles. The next session is more about the environment and air quality as opposed to the high-level discussion at the moment. This would be in the process during our Full Options analysis.

[redacted] (EANAB)

Suggest that the CAS should be extended to the sea for maximum FoF usage, and we need CAS here

I am currently speaking about 4 SIDs and then I'll talk about arrivals. For the EAST SID we do need CAS and we are engaging about this already. I am trying to put across high level options currently and will add more detail in the next session.

Arrivals

Welcome back and this session is about arrivals. On a busy day in summer on Rwy 06 departs via TALLA and GOSAM with arrivals concentrated to the southwest. For runway 24 a lot of arrivals route from the south and are relatively dispersed. You can see how the traffic patterns vary and also the slid illustrates quite nicely the different percentages track use.

A video was played of live traffic to illustrate how aircraft are sequenced to Rwy 24 and how the traffic is vectored on Rwy24 towards Edinburgh when busy and then downwind left hand. Traffic is vectored in and fairly dispersed when arriving from the south. Arrivals are given vectors and stepped descents to allow aircraft to arrive. They look about 7 miles apart but can be reduced to a 3-mile separation. All of the departures are given 2 minutes separation. At some airports subsequent aircraft can be released with less than two minutes separation as long as the airborne aircraft has turned away from the route the subsequent aircraft wishes to take. We are sure we can improve on this at Edinburgh.

This video is all from Controllers giving headings and levels and you can see when busy aircraft are put in the hold with aircraft also running downwind. The Controller tries to get the arrivals in as soon as possible. Without systemisation there may be at least 6 or 7 transmissions to each aircraft to enable the aircraft to arrive safely. Aircraft are vectored in at least 6 miles apart to allow for departures but without any departures the arrivals can be sequenced closer together to save track miles. All of the aircraft come from Prestwick centre inbound and there is a lot of dispersal with traffic routing in from generally the south and west. The Controller needs to decide when to use the

hold as a sequencing tool. Different arrival options may allow for more systemisation which gives more predictability and efficiency.

There are four arrival options.

These are holds and vectoring.

Some vectoring and some systemisation.

Full systemisation and point merge. Point merge has been offered from Prestwick Centre but we may not take them up in this.

This slide shows how aircraft join the hold from en-route, they are then sequenced giving headings and levels to fly on to a base leg and then final. Speed control may also be used as a sequencing tool. What you don't want to do is take them off final unless in exceptional circumstances as they want to make a stable approach to land without going round. The slide shows actual tracks on Rwy06 and how they are vectored.

The following slide shows aircraft approaching for Rwy 24. Inbounds via STIRA are vectored over the firth of forth and then in from the north. There is quite a big dispersal of tracks from TARTN, and you can see about 90% of arrivals are routing this way.

This slide shows our concepts of arrivals and as well as Edinburgh and our airspace change NERL are also in the midst of an airspace change and we need to fit these together. NERL have given us holds to use with the possibility of point merge. What we could do is implement an approach transition which is basically a flight path to fly along so the aircraft is not given vectors but flies an approved flight path on a chart and follows this path to landing. This reduces the workload of the controller and also of the pilot. The Controller will clear the aircraft to fly the transition and final approach which drastically reduces the number of transmissions and allows the flightpath to become more predictable.

The four approach options were repeated.

Finally, capacity

One of our drivers for our ACP is capacity. Currently even though our 3 SIDs look separated they are treated as one route with a 2-minute departure interval giving a departure capacity of 28 per hour. If we can reduce this interval to let's say a minute and a half, we could increase this number to 35 or perhaps 40 per hour, reduce delays on the ground, and improve air quality. What could happen is we could allow a departure to GOSAM from Rwy06 and as soon as this aircraft turns, we could have a TALLA departure thus reducing the interval between departing aircraft and increasing capacity. Currently though we have 2-minute interval.

So how could the design or split of these SIDs increase capacity. The slide looks at reducing the minimum safe interval between SIDs and also how the split point of SIDs could contribute to capacity because the subsequent departure could be released for take-off. 4 SIDs could give us even more capacity.

If an aircraft departs with 2 minutes separation what is the distance between the first and second aircraft. We are looking at measuring the distance between aircraft, making sure it is safe and then approving a shorter time between departing aircraft. If we can do this, we can increase capacity without introducing more SIDs and indeed early turns after departure.

The next slide is a reminder that a balance needs to be struck between modernisation, capacity and minimising the environmental impact. Against the systems that we have. This is a quick recap.

The next steps are to look at feedback and use this against our design principles. We have an ADSB aerial on the fire Station training tower looking at departure intervals and gathering information to prove the safety case.

We are looking at increasing our capacity and in order to do this we need to work with Prestwick Centre to see if they can work this higher volume of traffic in their airspace. We are also looking at our SID exit points and whether they will move to improve the network, for instance the GOSAM SID may be truncated and the TARTN hold may move a little to the west. This will need some collaborative work including simulator time. Can we get our systemisation better?

As far as our ACP is, safe intervals on departure, where can we split our SIDs, what are our route options, and which is the best one.

We are looking at capacity, optioneering, environmental design principles and then we carry out a qualitative appraisal of our options in phase 2B. There will be further engagement in late March, we shall also consider the rest of the design principles and answer feedback. There is also a virtual engagement platform that will be up and running at the end of March. We are using this as a test for our public consultation next year with a view to transparency.

That concludes my presentation and I'll take any questions.

This initial engagement is to tell you about our options and the process for narrowing them down.

[redacted] (EANAB)

Communities on the ground were not mentioned in the arrival's aspect of the presentation and some of the arrivals go more to the east and miss the population of Midlothian. Some aircraft are vectored over Inch Keith, and some go further down the Forth. Departure splits would only work if aircraft were using different SIDs.

There is only a certain distance aircraft can go within the boundary of controlled airspace with a limit to the east. We could make improvements with systemisation from the hold, but this would concentrate some aircraft. We are talking about more systemisation and the options will be expanded on in the next sessions. The constraints about vectoring and delay are up to the controller at the time and trying to get them 6 miles apart on final needs techniques such as using the hold and lengthening the downwind leg. This needs to be done within the boundary of CAS.

If we can approve the departure split for 1.5 minutes this will improve capacity. 2 minutes is inefficient at the moment and can happen on the same route.

[redacted] (LAA)

Systemisation is the key but not at the airport level to start with. This needs to be sorted at the en-route level. This is the key to sorting the best solution. We are looking at improving the network between Edinburgh and Glasgow. NERL are looking at increasing capacity on the spine of the country which Edinburgh support. Point merge is also full systemisation as is an arrival management system. This involves buy in from all airlines and we look to improve things as far as carbon making.

[redacted] (airspace4all) Collaborative decision manager. This has been put together by Euro control and is available free. Point merge gives a delay or catch up for any discrepancy en-route. CDM would be a great advantage for the Scottish airports. Systemisation is optimisation.
[redacted]

How did we get on? NERL have said they should be able to cope, and they may need to move some sector boundaries.

Attendees:

Name	**Company/Representing**
[redacted]	Attending on behalf of Cumbernauld Airport
[redacted]	MOD
[redacted]	Traxinternational
[redacted]	BUTA
[redacted]	HIAL
[redacted]	NATS
[redacted]	HIAL
[redacted]	LAA
[redacted]	systemwise
[redacted]	airspace4all
[redacted]	AGS airports
[redacted]	EANAB
[redacted]	EANAB
[redacted]	Scottish handgliding and paragliding
[redacted]	EANAB
[redacted]	EANAB

Engagement Session 1 –

Transcript from the Session on the 1st March

EDI ACP Stage 2 briefing 01032022

Transcript

Confirmation that the slides were showing.

Welcome to all for our ACP briefing at Stage 2 A. We are now doing some initial testing with you our key stakeholders of some option outlines. Today I'll run through our programme. We'll have a quick recap of where we are in the process. I'll talk a little bit about the masterplan and our statement of need and where we are with our airspace change drivers as a recap really. We'll have a look at our design principles and some of our options at a high level. We'll pause for questions on our departures, have a break talk about arrivals, something about capacity have a quick recap and more time for questions.

The programme of CAP1616 Stage 1 define we submitted a Statement of Need; our stakeholders came up with some design principles and we passed through the Stage 1 gateway with these in July last year. We are now at stage 2 A the option development stage where we engage without key stakeholders, yourselves, and you can let us know about the options we are coming up with. We will have a second stage of engagement where we will look at our swathes in more detail on maps and how our design principles are affecting those swathes.

So as we move forward we work with NERL who control the network above us from Prestwick centre and Glasgow as well. We are part of a UK wide masterplan and part of the Scottish TMA cluster. This has advantages and disadvantages, and one of the advantages is that we now work with ACOG, the Airspace Change Organising Group. We will submit our Stage 2 in July and work with Prestwick centre to get the best improvements to the network and if there is any crossover with Glasgow, we will work with them. This is all part of CAP1711 and the Airspace modernisation Strategy. We are all looking to reduce delays, improve environmental performance, better manage noise and possibly facilitate defence and security objectives.

Masterplan iteration 2 has been published and we need to identify our interdependencies with Glasgow.

In Stage 2 A we need to develop our options that align with our defined design principles, identify all possible route options. This could involve looking at hundreds of lines on a map, but we intend to make this understandable. We need to gather feedback on these design options from yourselves and whether we have identified them all, and then we will come back to discuss these options in more detail.

Our drivers for airspace change are to modernise the airspace. Currently our flight paths are based on beacons, for example at Glasgow and Turnberry, and these are coming to the end of their operational life, so we need a replacement. We will introduce RNAV routes (area navigation) and use Satellite navigation to bring the airspace up to date. This gives us more flexibility and we can possibly make the flight paths more environmentally friendly. We are also trying increase our capacity by systemising our airspace and increasing capacity in the air and also reducing delays on the ground.

If we can get aircraft departing with shorter intervals between them there will be less delays on the ground which keeps ATC and the airlines happy. This leads me on to the environmental impact an aircraft delayed on the ground, makes more noise, burns more fuel and decreases air quality. If we can reduce delays the benefits of the environment will come. Systemising airspace is another way to optimise this as well, so we are trying to get more aircraft into the same volume of airspace.

The three drivers.

The beacons that are currently used are about to be switched off, so we need to modernise. Ground beacons will be phased out, and RNAV routes will be introduced. RNAV routes mean more systemisation, less instructions from Controller to pilot, less workload, more concentration and more predictability. The routes would be already there for the aircraft to fly on and so they will require less vectoring. When the routes are implemented, they need to be deconflicted from others to make the system safe. Because we are using satellites, we would accommodate RNAV aircraft only. This is something we can cope with. We are looking at decreasing the departure interval so less time between aircraft departing at the moment aircraft depart 2 minutes apart so approximately 30 per hour, and we are looking to decrease this to a minute and a half so 40 departures per hour.

We were looking at separate routes for slow and fast aircraft, but this would complicate the system. We are looking at the split point of departure route which will increase capacity. At the moment there is no split point, and the aircraft are effectively on the same route.

The environment is also a driver, so we are looking at implementing flight paths that overfly the minimum amount of people with the least track miles to reduce emissions.

We need your feedback on your ideas and there will be more detail in the next round on swathes and how they are used.

This slide reminds me of a guitar amplifier and is about the mix of modernisation, capacity and environmental impact, against the airspace system above us, the local ATC system and our routes.

A reminder of our design principles that were constructed by stakeholders and approved in July last year. One of them has changed but more on that later.

The first six on the slide are our core design principles.

We must be safe or safer than today.

Flight paths must be flyable and fit in with the current system, and there is no reason why they shouldn't. We have a flight planning system that works well at the moment. This will stay the same with the addition of RNAV.

FDP 3 They will be designed as PBN flightpaths and fit in with the AMS.

We will work with Glasgow and NATS Prestwick to deconflict any of the design options. We work with NATS at Prestwick and attend numerous workshops to comply with this. They are running visualisation sims at the moment, and we will shortly be able to visit in person.

Precision based SIDs and possibly arrival routes will allow predictability and consistency of operation.

Collaboration with other Scottish Airports and NATS is taking place to allow for compatibility with the wider network. This DP 6 is the only one to have changed since we submitted at the beginning of the pandemic, and this was on the instruction of the CAA. As part of the governments AMS, we have

some public money to help with Stage 2 along with Glasgow. This is much more complicated in the southeast of England. We currently have a good working relationship with NATS and Glasgow.

Our other design principles are not core but still very important. These again were brought forward by stakeholders in Stage 1.

We should minimise the total adverse effect on health and quality of life. Created by aircraft noise or emissions.

Flight paths should be designed to minimise the impact of aviation noise in such a manner consistent with the government's overall policy on aviation noise unless this would disproportionately increase CO2 emissions. This works if the flightpath overflies no one if the aircraft reaches 4000 feet.

Flight paths should be designed to minimise population overflown below 4000ft and between 4000 and 7000 ft taking into account any potential impact due to those overflown having protected characteristics as defined by the equalities act. Protected characteristics are included in anti-discriminatory law and includes age, disability, sexual orientation to name 3 on the list. We shall do our best with this. An example may be the overflight of a special school in the vicinity of the airport. Our flight paths will be designed to minimise overflying sensitive locations which include schools, special schools, retirement homes, care homes etc. and we'll do our best to avoid these. We will have a list of sensitive locations and will try to work the best solution.

Flight paths should be designed to include track concentration and/or dispersal and we have a challenge here but also some ides such as flying along the M8 corridor or the Firth of Forth.

Flight paths should minimise fuel burn so shortening the route is the obvious thing to do here is possible. Can they have an early turn to save fuel?

Efficient and effective route management should be taken into account which means the planned operation of a flight in the most efficient way. No delays and an efficient route structure. Working with ATC and planning the shortest route and also with the airlines.

Requirements of airspace users should be taken into account, which includes the GA community, such as light aircraft, gliders and microlights etc. so we consider the gliding community, Kirknewton and Fife airport etc. More engagement here is required.

Also minimising air quality impacts applies to aircraft below 1000 feet and we would need to monitor this if the flight path changes. We could reduce delays on the ground which would improve air quality in that aircraft would not be held on the ground.

Finally, there is a design principle about increasing capacity and benefitting Scotland through tourism. If airlines can fly in and out efficiently, fly another route or add a rotation then this would benefit tourism.

I will now talk about our departure options, and this will be followed by an opportunity for questions and a break. 24:00

We will now look at our current system and talk about departure options.

We have (in 2018) 5-10% of traffic routing to the north, 40-50% to the East and 40-50% to the south and west.

Those are the 3 directions of our departures and as such we have this system. GRICE to the north, TALLA to the South and GOSAM to the west and as such, do we want to change this?

So, the system and the runway usage is between 69 and 71% to the southwest and 31 and 29% to the northeast as an approximation. This is our route system with 3 exit points from each runway.

Our airspace is as shown 45% of our traffic goes to GOSAM, 45% to TALLA and approximately 10% to GRICE. The blue dotted line is the Scottish TMA (Terminal Manoeuvring Area) which is the airspace we are looking to develop. The red line to the west is the boundary with Glasgow. There are 3 departure points, also RAF Kirknewton, the gliding centre at Portmoak and Fife airport. If we need to expand CAS then we need to justify it. If we were to increase our CAS to the north, it would affect both Portmoak and Fife. We work with the 3 exit points as part of our baseline calculations. This is our baseline so we look at this and see if we can improve it. We will also look at Glasgow and their routes to see if there is an interdependency or trade off, but this looks unlikely. However, we may improve the network above us which would affect traffic at 7000ft and below.

This is our schematic system on the left and what it actually looks like on the right on the map. You can see the turns to the exit points from the end of each runway. Can this be improved and a turn for TALLA from Rwy06 could be moved away from the Fife coast, and also could we fly along the M8 corridor.

This next slide looks at aircraft tracks and you can see with our old navigation system these tracks do disperse to the north and once steady towards a beacon there is a narrow track. What we can do is concentrate the tracks with RNAV to make the route more concentrated. There is also displayed the TUTUR trial which was looked at but may well be an option but is in there for transparency.

We are also looking at aircraft types on routes as illustrated here. This is the way aircraft plan and the way they wish to go. You can see that if you have a turboprop you route via TALLA or GRICE and there is little choice. Our ambition is improvement.

Optioneering and where would we send our departures.

We would have a do-nothing option with three exit points and modernisation. An option with 3 exit points but routes designed with environmental issues in mind (so less people overflown using maps of population to design them) and finally an option with 4 exit points. We work with NERL to try to get an exit point to the east which would be an improvement on the current system A fourth route over the Forth estuary. This route is desirable in the cause of fuel saving.

This slide looks at options with three exit points. Rwy 24 as it is today but Rwy 06 could have the GOSAM SID turning either right or left to the exit point. We have to look at all options. We ned to look at this as this may be more beneficial environmentally.

This next slide looks at all the options with the EAST SID included. This is just an option and one we may be able to implement. From Rwy 24 there is an option to turn the East SID either left or right. Likewise, for Rwy 06 there is the opportunity to turn the GOSAM SID to the left or right and again this is just an option.

We are considering other routes such as a right turn to TALLA from runway 24. This gets above arriving traffic but is not good for track miles. Other options on the slide are the left or right turn to GRICE the long way round. Why would this option be chosen if there is little traffic using it. We need to look at options and whether they are of increased benefit. These longer routes use more fuel, consume airspace and have little benefit.

Combinations considered but dropped are 3 exit points from one runway and 4 from another. The issues here are that capacity is not balanced, this goes against standard practice and there is the

possibility of introducing errors through human factors. These possible errors could be mitigated against but why complicate the system. There are also issues with fuel planning in the case of runway changes and also why save fuel in one direction and not the other.

We are now moving towards the end of departures and on to swathes. From the basic schematics on the left of the slide we have moved to swathes on the right-hand side of the slide. There are a few things to think about with the swathes such as how Kirknewton is affected, and we may need to expand our CAS to the east in order to facilitate this extra SID.

This next slide shows Edinburgh the coast and our CAS boundaries. The contours show where aircraft could be at 2000ft, 4000ft and 7000ft. Everything is in the mix and the red lines show where 2nm and 3nm are from our CAS boundary. That was Rwy 06, and we have similar contours from Rwy24. These are design tools that we use in order to plot flight paths in the next stage.

We can also see the effect on population of the M8 corridor and also how there is a population at Cramond on the runway centreline. It shows that if we can turn aircraft left, they can move away from Cramond.

I have a few draft swathes from Rwy24 before questions. The swathe illustrates where an aircraft could fly to get to GOSAM. If the aircraft routes outside the swathe, then the track miles would be too excessive. We use common sense with the design principles and could the M8 corridor be a solution. We can draw as many lines as we like but we want 2 or 3 possibilities.

A draft swathe to TALLA is illustrated and some of these flight paths go straight over Kirknewton and something which we need to provide more information on.

We also have a draft swathe to GRICE so the aircraft could route over Winchburgh with an early right turn, turn later on after Broxburn or indeed further west. The M8 corridor could be used, and we must take into account where residential areas are being built.

This final departure slide shows actual tracks. As you can see for Rwy06 very little traffic routes near Edinburgh. Most traffic turns over the south Fife coast and also near Kinghorn. Once to the west passing 7000ft they can route into the network You can see the effects of dispersal above 7000ft. On Rwy 24 you can see the Firth of Forth is clear. Each SID has dispersal further away from the airfield and this project is all about improvement. If we did nothing the aircraft would still overfly these routes. However, I am sure we can make improvements. Once we have decided where our flightpaths are going, we will speak with our GA community and look at our CAS dimensions. Once we have our flightpaths we will see if we can improve the situation for GA traffic routing under, around or through our CAS. This is something we need to do in the process. That's the end of the first part of this briefing and in the second half we will be talking about arrivals and capacity.

There is now the opportunity for questions before a break.

Colin,

Actual track departures looks as if the runway is in the Forth estuary. This was clarified and also clarification on a decreased departure interval that would increase capacity. The wording on the slide needs correcting.

Robin,

Planning consultant for Winchburgh. You showed a slide for Rwy24 to GRICE. I've been involved for a while, and Winchburgh is going through strategic expansion to a population of 11000 and Broxburn

is going through a smaller expansion. This was a problem previously and was not taken into account. Is minimising population overflown a significant factor?

The answer is that we would look at our available maps and look at projected residential areas 10 years hence and this ACP has to be fit for purpose for 10years taking into account these future plans. We would try to get the best route taking into account future populations. This is important that the growth areas are factored in.

Its good to hear that we will be looking at future plans.

Karen,

The source of the population maps and future expansion. These slides are compiled by our consultants and our environmental consultant has updated all of our maps. The slides are schematic, but we will use the most updated maps and use these going forwards. There are numerous maps for instance of sensitive areas.

WSP The mas have been updated in the last 2 months and they show population density.

A scan has been done of all of the developments in the planning portals and these show on the maps as well.

Robin, Any projected build would be made available for WSP.

Time for a break and we'll be back in 10 minutes. Thank you.

We'll carry on and I have a video to show of actual tracks from 2018. It shows how our arrivals are dispersed and how our departures are concentrated. This video is in the virtual engagement room. It shows how the arrivals come from a wide variety of routes and are vectored in by Edinburgh ATC and also how there are a lot fewer tracks to and from the north. You can also see how with there being less airspace for Rwy06 the hold is used more extensively.

The video is played and a speeded-up version of typical traffic is played. The Controllers are trying to vector the arrivals to about 8 miles final you can see departures are all 2 minutes apart. As the situation becomes busier you can see that the hold is used for separation purposes. If a number of arrivals turn up at the same time, then you can see how the hold is used and how aircraft are sequenced in from the north. Systemisation should optimise the airspace and minimise delays and is something we are looking to introduce. We may also look at other methods of efficiency such as collaborative decision making which is not to do with the ACP but something for the future. These videos are available in the virtual engagement platform.

This is just to show that to show that the Controller probably needs to issue 6 instructions for headings and levels in order to recover the aircraft to the airport whereas systemisation would reduce the workload for both controller and pilot.

I will also point out that some areas are barely flown over during a normal traffic day.

I'm now going to talk about our options for arrivals. We have 4 options for departures and indeed 4 options for arrivals. This slide looks at aircraft in a hold, then they are vectored to final approach in a stable flight configuration. This is the current way that ATC works as aircraft arrive from en-route and then may enter the hold. They are vectored to final and the fly an approach to land.

You can see here that aircraft arriving on Rwy06 may be held at TARTN, where you have the hold, vectoring and then final approach. This is the same for Rwy 24 although the hold is used less as there is more airspace to the east of the airport.

Our arrival concepts have the hold, vectoring and final approach. With some systemisation we would have a T-bar for an RNAV approach. We could also have an approach transition which is full systemisation to finals where the controller can give the aircraft clearance to fly the approach and the aircraft would then fly along a predetermined and approved flightpath to land which would reduce the workload for both controller and pilot alike. This approach transition would concentrate traffic wherever it was designed for.

We have also been offered point merge as a systemised way of sequencing arrivals and more information is available in the virtual platform.

Our four options are vectoring to final (do nothing), introducing and RNAV approach, more systemisation with an approach transition, and finally point merge. These will be described in further detail in the next presentation. The purpose of this presentation is just to outline all of the options.

Finally, I will move on to capacity.

What we are trying to do is increase capacity. There is a speed table on the slide and most aircraft have to wait two minutes before departure and the route they are taking does not affect this, so all routes are considered as a single route. The splits on the SIDs are not currently used and so most aircraft depart 2 minutes apart. Could we increase capacity by bringing this split closer to the runway or could we reduce the departure interval and make the aircraft depart perhaps one and a half minutes apart. We are currently looking at live data to achieve this reduction in a departure interval so increasing capacity. If we achieve this, then we will also need to move forward with Prestwick centre to see if we can achieve this. Of course, if we increase our capacity then we will need to make sure they can accept the increase in traffic.

This slide shows how using actual separation can increase capacity by reducing the time interval between departures. This will reduce delays on the ground and help to improve air quality while reducing carbon emissions.

I have spoken about our departure options and arrival options, our ideas for increasing capacity and our drivers for this airspace change whilst looking at our design principles. In the next sessions we will cover all of our design principles against our options as we progress through stage 2 including population overflown and sensitive areas etc.

The project is all about weighing up all of our factors for the best solution.

Next steps.

We are looking at safe intervals for departure and will investigate the role of split point locations. We will create initial route options and look at our own options in conjunction with NERL. Also, we will need to refresh capacity requirements, look at environmental impact and use our design principles in our design principle evaluation.

Stage 2B is our initial options appraisal in a qualitative way and so does not involve quantitative analysis.

We are also working with NERL with regard to systemisation, traffic flows and capacity. Our SID exit points may change in particular GOSAM may be brought closer to the airport. We will also work with NERL with regard to our arrival options and work towards improving our airspace as much as we can.

The may purpose is that we do improve our airspace and the virtual engagement platform is being tested in anticipation of our public consultation. There is this presentation, a presentation on environmental issues and also the video we saw amongst other things. There is also a survey to gather feedback. On the slide there is also the airspace email, and you can use my email to give feedback and indeed you will find my phone number on my signature block.

Please get in touch with any questions and send your feedback.

You will be given a log in and please use this platform to your advantage. This will run until the end of March and now time for questions.

[redacted] EANAB

With regard to the platform, it sounds like a trial period and is not open until the public. It is only for key stakeholders with a log in.

You keep referring to delays for take-off and trying to reduce these delays. If we reduce the 2 minutes to 1.5 minutes, we can create extra capacity and enable aircraft when they reach the hold to go straight away. An inbound aircraft could delay an aircraft for departure but if we build the structure correctly, we can still reduce the wait at the holding point. We could also reduce delays with groundworks, but this is expensive. Improvement is the motive. We are trying to allow airlines to operate when they wish.

[redacted], traxinternational

This is all about noise. Can you publish noise contour maps with regard to this consultation?

This will come in Stage 3 when we have our options. This sounds unfortunate and we are interested in the different effects in the 3 and 4 route options, these decisions will be taken in absence of information. The noise assessment is based on population overflown. In the past the decision was taken on traffic management as to runway orientation. Just to say we will look at elevation this is very sensitive so we would appreciate a 20-degree turn. A constant radius approach has been disregarded. There are particular issues with schools, rest homes and kindergartens. If we can avoid this area with a turn, then we shall do this. When the decision is made there are 3 or 4 options.

We understand the issues at Cramond and is very prescriptive of what we do when and how we go to the CAA to see what we are doing. We have to demonstrate that we are following CAP1616 and the design principles and looking at this as part of the process. This stage outlines our approach rather than looking at the detail of routes as this should be a qualitative approach. We are well aware of Cramond and the issues that they have. We need to make sure that we move through the process.

The danger is that you will not follow the process if you do not follow the noise contours for the designs. The full appraisal happens at the start of Stage 3 and this is when the figures have been applied. Nothing is decided until after public consultation. We can't talk about solutions until we have been through the process. Clarity can be provided on the noise analysis. The virtual room has a link to the CAP1616 process.

Any more questions

[redacted] chairman of the strut of the LAA.

We have continuous requirement for zone transit and the maps show an absence of aircraft in certain areas. As we approach your zone from the north, we have a clearance not above 2000feet.

Is 3000 ft a better level to let us through. Transiting at 2000ft could well be because of go-arounds. One of our design principles is to look at the requirements of airspace users. This sounds like an operational issue for ANSL. I have to say the zone transit service is excellent. It does strike me that staying at a lower level is somewhat strange.

Any more questions?

Thanks for being on the call. We look forward to further participation and please look at the virtual engagement platform Thank you and see you next time.

Attendees:

Name	**Company/Representing**
[redacted]	traxinternational
[redacted]	ppca
[redacted]	ep-scotland
[redacted]	Burntisland community council
[redacted]	EACC
[redacted]	Glasgow Prestwick
[redacted]	Glasgow Prestwick
[redacted]	NATS
[redacted]	HIAL
[redacted]	Ryanair
[redacted]	Consultation Institute
[redacted]	Consultation Institute
[redacted]	anderson strathern
[redacted]	LAA
[redacted]	systemwise
[redacted]	airspace4all
[redacted]	JET2
[redacted]	HOW
[redacted]	EANAB
[redacted]	ME
[redacted]	MOD

Engagement Session 2 (2 online sessions and 1 hybrid session)

Transcript from the 24th May 2022

Edinburgh Airport ACP Stage 2 Engagement Session-20220524_100502-Meeting Recording - transcript of meeting

Attendees are detailed at the end of the session

Meeting started 09:05 24th May 2022

Simon Rhodes (SR) –

Right so I hope you can see a title page that says Airspace Change Programme, is that right June?

June McClung – Yes, I can see that.

SR –

Excellent. Thanks very much its working, so I'd just like to talk about Options Development and Ideas on Design Principles

I've done a rough introduction – I won't go round the room for people to introduce themselves, I know most of you already, so this slideshow is going to be about a recap of where we were and what we've been doing. A quick look at Capacity, because that's changed a little bit from pre-Covid. We're going to look at our Departure options, after which we'll have a short break, look at our Arrivals options and look at some Environmental Design Principles

(Programme Approach CAP1616 Slide) So this is where we are in the programme at the minute, Stage 2 Develop and Assess, step 2a Options Development, so we're working on 2a, and we've just started working on step 2b options appraisal as well, so we're moving forward with our engagement documentation feedback all that kind of thing, and a few things we need to to do to progress the airspace change

In Stage 2 Options Development in the procedure or the process CAP1616 which we follow we need to develop one or more options that address our Statement of Need and align with our defined design principles and identify all possible route options, we've tried to do that, and I think you'll see that in the slides we are about to show. We've been gathering feedback on our design options, from stakeholders after the first round of engagement and then it's, we applying our design principles correctly, and we are describing all options we have with capacity and airspace issues, and we are looking at possible additional controlled airspace that we would need to implement our ideas and design options however that's not a given it's something that we might not get. And also, we are looking at areas to avoid, and sensitive receptors.

One of the main things in this engagement towards the end is that we are thinking about community concerns and Noise, Air Quality and track miles which is also to do with carbon reduction, possible respite and also sensitive receptors. I speak to our community representatives possibly every couple of weeks and they give me lots of good local information about that, and for 2B which is basically a

qualitative assessment of our options we do look at some maps and software but basically what we are going to do is describe and write things before we go into further analysis, which happens at stage 3 later on this year.

A reminder our Drivers for our Airspace Change is Precision Based Navigation (PBN) we want to modernise our airspace – move away from being reliant on Beacons to navigate, and more on SATNAV. We've looked at Airspace Capacity because the airport thankfully is growing again, and we need to increase our runway through put of movements, and we think we can do that with some clever designs for our SIDs, the Airspace needs to last 10 years from implementation so we are looking at trying to increase our capacity over those 10 years and meet that we meet the needs for future growth so that one thing that doesn't hinder future growth is our Airspace Capacity. And we are also looking at the Environment and minimising our environmental impact, which we can do in 2 or 3 ways we can reduce the number of people overflown, how and when they are overflown, and we can also reduce track mileage, which is where everybody wins because we can reduce CO2 emissions and have fuel savings as well. And also, we are going to look at Air Quality, which is one of our Design Principles, that will come later on in the Airspace Change Programme though.

So just a reminder of our Design Principles

Most of these we have covered already in the first presentation so just a quick reminder that,

The Airspace needs to be safe or safer than it is today, it must be flyable,

technically supported by ATC, and airport management systems,

Flightpaths must be designed to allow modern aircraft to use PBN, so our flight paths will be using PBN if nothing else when we've designed them

We must speak to Glasgow and that's at Prestwick deconflict all of our new flightpaths make sure that they don't interfere with Glasgow's, or if they do that, we've coordinated them so we both know what we are doing, which is something that's been happening over the past few months, certainly our flight paths will be based on charts and predictable so Airlines will be able to flight plan with them and make their operations consistent

The 6th one on this page is again that we collaborate with other Scottish airports and NATS to ensure that the design is compatible with the wider programme so at the moment we are part of a CAA Masterplan where us Glasgow NERL at Prestwick are moving together for implementation as soon as we can get it, but its looking like tis going to be early 2025, and we move as a- programme, and there are other programmes throughout the country so there's one around the Manchester area one around Cardiff and a very large one around the South of England but we are moving first so we should implement first I think.

A little more on what I want to concentrate on today, we have some other design principles, again these were from Stage 1 and where various workshops took place, and these are the design principles that have been approved and passed through the Stage 1 gateway with the CAA,

We are designing flight paths to minimise the total adverse effect on health and quality of life, looking at noise up to 4000ft and indeed7000ft that is an Environmental priority. Up to 7000ft

We are trying to minimise population overflown in Design Principle 9 there, and account for any potential adverse impacts, a bit more on that later,

We are designing our flight paths to minimise overflying sensitive locations and noise sensitive receptors, there are a couple of red herrings inhere I would say, the Zoo which is in Edinburgh City Centre which we wouldn't overfly anyway, and various other sites like heritage sites in city centre , but we have certain maps which can identify those and also relying on local knowledge so people tell us where special schools etc like that are that we may wish not to overfly.

Another HEALTH AND Wellbeing one is that we should include flight concentration which is what we are doing with our SID's and track dispersal options which you could argue we do at the minute with our arrivals, and we are going to try to provide some respite which is difficult to achieve but I'm sure we can do something with that and a bit more on that later

Our flight paths should be designed to minimise track miles and fuel burn, fairly obvious we make them short and as efficient as possible which brings me onto the next one where

We'd like aircraft to carry out continuous climb and continuous decent operations, which means they are being flown in the most effective manner. And we achieve that today generally, continuous climb operations are up at 100% so long may that continue.

We need to look at the requirements of other airspace users, and they should be taken into account when we are designing these flight paths, and they should be designed to minimise local Air Quality (AQ) impacts, that will come in when we look at the entire programme as a whole, and we have designed where the flight paths are going to go, a little more on that later.

And finally, in a boon to Scottish tourism we should maximise our capacity so that's something we've looked at as well.

A recap of the Current system, we've got 3 SIDs with 3 exit points, GRICE, GOSAM AND TALLA and we have 2 minute separation on all routes, which gives us a departure capacity of 28 movements per hour, we think, and this is what it looks like schematically, so in the top right hand box if you look at the diagonal left to right slow aircraft behind slow needs 2 minutes, fast behind fast needs 2, and we find we have a capacity of about 28 departures an hour , but that is because each of these , it looks like we have 3 routes but we count them as one route , we have to wait for the first aircraft to go, wait 2 minutes let the second one go and that gives us a capacity of around 28/hour. We are trying to improve on that.

So hot of the press – at the beginning of the air space change in 2019 it was identified that there was an hour between around 6 and 7 in the morning where we had multiple departures, and if Covid had not happened by the summer of 2023 there would have been a lot of holding on the ground because a lot of aircraft would have wanted to go between half 6 and 8 in the morning. A lot of those aircraft were business flights down to London or to various points in the UK and near continental Europe with Flybe and British Airways KLM so there was a definite rush hour, at the start of the day in 2019, and that was going to grow and hit the capacity of 28/hr. As you can see 28 is on the red line there at the top, and on these maps, they look complicated, but each line represents a different day of the

week and there's a time band along the bottom there. And so, you can see at 6:15/7 o'clock there's a peak for departures in 2019. And in 2027 we think there's a peak as well, but it doesn't hit 28 movements in 5 years' time which is interesting, that's departures and you can see that the capacity is always below 28. Let's move onto the next slide,

This is Arrivals and you can see it's a little more spread out during the day, so the peaks aren't as great in 2019 however in 2027 you can see peaks at about 15:15 Sunday afternoon and a couple of hours after that in the afternoon, so what we are looking at is a couple of peaks throughout the day as opposed to a large peak at the start of the day

And when we add those together for both departures and arrivals you can see capacity at 42 movements an hour isn't hit in 2019 but we do hit it in 2027, that's departures and arrivals so we still need to do something with our Capacity. I'll move on and hopefully show you how we are going to solve that

A quick reminder here of what goes on at the minute, you can see that on the left hand side , Runway 06, Blue is for the departures, we get some good dispersal once they've moved away from the airfield, and the arrivals also give us some nice dispersal in the yellow colour, and you can see there mapping across the south of Edinburgh Airport on R06 , R24 a little bit' more concentrated, but that's something we'll keep going with because that gives us dispersal for both inbounds and outbounds. With a caveat that with our SIDs and design for noise we will be looking at aircraft climbing up to hopefully 7000ft before turning.

And Just a couple of points to make here, that restrictors with what we are trying to design, so if you look at this (new slide) this is our controlled airspace with the runway in the middle the short black line, this is where we are trying to keep our procedures inside, so the dotted line to the west near Cumbernauld airport is our zone boundary to the west and there's a buffer zone between us and Glasgow and were trying to design certainly our departures to not cross the buffer zone or if they do they'll be above 7000ft. We think we can achieve that which means below 7000ft our procedures are relatively independent of Glasgow's (ACP) but above 7000ft we need to speak to NERL and Prestwick centre and see how they do interact with Glasgow's, we have been doing that throughout the last few months and will continue to do so, and there are SIMs planned to look at our designs and how they interact with Glasgow's and NERLs possibly before Christmas.

Looking at this we are restricted by the controlled airspace around us with a 2-mile buffer zone which is what the shaded blue area is. Also if we are going to have a design principle of minimising over flying of areas of dense population then the city centre of Edinburgh is out which is why there's a large red cross on it and also we have an airspace issue at RAF Kirknewton, which is just been illustrated there by the sign, so it's something else that we should miss, What we are looking at is can we have a SID that overflies there when they're not active and a slightly different route when they are active, there's some safety issues around that that we need to solve, but I know it happens at other airfields but we might not be able to make it happen here because this glider site so pretty close to the end of the runway and also up to 3900ft which is relatively high but it's one that we are thinking of as one of our options

We will look at Runway 06 (R06) now – Departures - with 3 exit points and GOSAM routing by the north, this is what happens at the moment this is runway 06 in the middle, with 3 height contours within controlled airspace, representing 2,4, and 7000ft, the orange wone is 2000ft the light green 4000, and dark green 7, and the SIDs we have a left turn to GOSAM and one routing up to GRICE and one round to TALLA. That's what we have at the moment.

We've had a lot of debate about these representations and slides, and we think that rather than put a swathe on, rather than put lines and figures, and flight paths and all of that kind what we are trying to do is keep it kind of simple so that I can explain it and move onto the next one pretty quickly otherwise we will b here most of the day, so this is runway 06 with 3 departures – the ones that we have at the moment GOSAM, GRICE & TALLA and they are all considered as one route – they are all departing and turning once they are away from the airfield which means there isn't really a split. So, at the moment they would have to have 2 minutes departure separation, between each one which gives a capacity of 28. Over the last few months, we've had and arial out on the airfield that's been collecting live data, an ADSB arial, and it's been looking at the separations of our departures, and we have created a safety case where we think that we can reduce that time to 1.5 minutes or 90 seconds. We could probably reduce it further but having spoken to ATC one and a half minutes is mentally easy as opposed to 1-minute 20seconds or one minute 40 seconds, so let's go with 1 minute and 30 seconds.

If we deploy 1 minute 30 seconds between departures if you look to the right our capacity goes up to 35/hr instead of 28, so we can do that with the procedures we have now. You see here the 5NM that under capacity at the moment the standard separation between us and NATS at Prestwick is 5NM if in future we need more capacity we could reduce that to 3NM separation perhaps with safety issues and hoops to jump through, but it is a possibility. With aircraft 3 NM apart, you get in the same volume of airspace your capacity increases and goes up from 35/hr to 40

So, at the moment just with the SIDs we have at the moment reducing the departure interval we can prove safely that we can have 35/hour as opposed to the 28.

And if you look over here, we have one smiley face for departure capacity and one for airspace issues because using this there are no real airspace issues.

Now if we slightly change our SIDs and have a GOSAM of R06 that turns left as soon as possible with the GRICE and the TALLA still being one route that means that half of our aircraft use GOSAM so that means that they turn early and you can again reduce the departure interval, which means that the capacity increases and goes up to 40 or 48 with 3NM separation. You can see that the numbers are climbing here, and we are achieving something, but if we kept with the single SID i.e., GOSAM didn't have the early turn, and continued on with GRICE you can see its now at 34/hour

Our Departure Capacity increases and no new Airspace issues or no new ones anyways, as we are nowhere near Kirknewton, we are not going by the airspace boundary, and we are avoiding Edinburgh.

And here's some more options where GOSAM and GRICE turn early, and TALLA after Cramond continues straight on. If we, do it this way you can see with the 5NM separation we have 42 Capacity and with 3NM we have 49 so capacity is achievable just with the 3 SIDs we have at the moment

However, we of course would like a 4th SID but we'll just talk about the 3 SIDs with the routing to the South, where the 3 SIDS still go straight ahead as one route, we go back to 35/hr Capacity , but instead of GOSAM turning Left its going right, gone around Edinburgh City centre while climbing and turning right here and there might be airspace issues not with Kirknewton as we should be high enough but with inbounds from the South, so what we are doing there is cutting across lots of inbounds, we could run it through the simulator and see if its higher than those, but not a great idea really, something that in our long list of options a left turn is better but we still analyse this as an option. So, what we are doing today is showing you all of the options and we'd like your feedback on that, and this is what we think. We'd get 35/hr Capacity again with good Capacity but there's an airspace issue there with confliction against inbounds from the south.

With the slight change with this one we turn GRICE immediately with the other 2 going straight ahead, but you can see that the Capacity only increases by 1, so is it really worth increasing the capacity on one movement if GRICE takes an early right turn, that's something we will have to analyse, and we still have the issues with routing around the south of Edinburgh and conflicting with inbounds.

We now go to 4 exit points of R06, with GOSAM routing to the North. We can achieve increased capacity with 3 SIDs, that we have at the moment, and we have proved that we can do that with the arial out on the airfield and reducing our departure interval. We'd like the 4th SID out to the East because the fuel savings on that are very large let's say, something that's still to be worked out for us, but throughout the whole of the UK and the implementation of this modernisation and modernising the airspace this is the route that saves the most fuel throughout the whole of the UK so if we can get a route out to the East that'd be great.

At the moment as you see everything departs of R06 going straight ahead with provisions for Cramond, and you can see the Capacity is still 36, but the fuel savings are great and also it's something that our communities want they've fed back that they want more aircraft using he Firth of Forth as opposed to flying over the Fife coast. So, the more we can get going that way the better. And as you can see Capacity has increased somewhat not a lot, only one smiley face and the airspace issues if we can get the controlled airspace out to the East again, we are not conflicting with inbounds or near Kirknewton.

Now if we get a split here if you read the writing on the right hand side ' a 45 degree split' between GOSAM and the other 3 SIDs, you can see the Capacity goes up to 42/hr with 3NM separation up to 48, compared to that single SID of 36/hr, so if we get just one split from GOSAM and the other 3 we've increased our Capacity by 6 /hr and as you can see we are pleased by that – 2 smiley faces. I'm showing you lots of options here, at the end of this you'll get the presentation and you'll be able to comment on it all and we really value your feedback. But you can see that looking at and analysing SIDs we are on track to increasing capacity which is one of our drivers, modernisation being the other one, and the other one being the Environmental issues which we will come onto.

And again, if you take the 45-degree split between GOSAM and then GRICE and you assume TALLA and EAST are going straight ahead, you increase the capacity to 45/hr as opposed to the 28 at the

moment, so again you're achieving it and that's really good for our capacity and again no airspace issues. So that looks like a good option at the moment.

Again, we look at all options so - Runway 06 with 4 exit points – GOSAM via the South –

4 SIDs go straight ahead, but GOSAM routes to the South, similarly we get a 36/hr departure capacity but again we have issues with GOSAM cutting across inbounds, should be high enough but again the preferred option airspace wise would be a turn to the left.

R06 again – This time with GRICE an early left turn and the other 3 SIDs straight ahead, we've increased the Capacity by a couple up to 38/hr as opposed to the 36, 45 degrees split but its not a great deal is it and again GOSAM cuts across inbounds so an airspace issue there.

Now then slightly controversial but with GRICE at the minute if you look a the way the SID moves – turns left and has to miss the corner here, safely by 2NM and then routes up which is more track miles, and we just thought what we would do is look at the option of trying to cut the corner which means we'd need more controlled airspace just here which is an issue for Fife airport and other light aircraft that operate in this area. But we've put it forward just as an option, we want your feedback on it, but I think I know what some people are going to say, but it's something that we need to talk about, and either take forward to the next stage or dismiss. So there are options that are there but it is only an option and not certain at this stage, but if we don't put it in as an option we may be criticised later by the CAA for not putting in all options, so it may well be in our long list and then look at it and say because we need controlled airspace up there and the feedback we've had and just the amount of aircraft that actually use GRICE it may not be feasible.

We now move onto Runway 24 (R24) having spoken about R06,

I'll go through some options for R24, and then we'll take a break. There's an awful lot more of these so what I've done is taken a few away they will be in the full presentation that I'll send, but I could sit here and talk about these departures in a meaningful way for quite a long time, but I think it would be an idea for people to go away to have a look in their own time and then give us the feedback, which is what we need.

This is runway 24 – with the runway here and also the coastline – again the 2000ft contour, we've got Kirknewton which is much more of a factor on R24, departures and then we have a 4000ft and a 7000ft contour and again Controlled Airspace routing round to the North and the East

At the moment we have 3 SIDs all going straight ahead to GRICE, GOSAM & TALLA. And again, they're treated as the same route, with 2-minute departure intervals, which gives us a capacity of about 28/hr but because we've had the arial up looking at live data we think we can reduce this to 1

minute and 30 seconds, which is where we get the 35/hr capacity for using this runway and possibly an increase of this up to 40/hr if we ever got the 3NM approved. But you can see just using the same SIDs, with the shorter departure interval we increase our capacity, which is one of our airspace drivers.

We could take an early turn with TALLA, some aircraft, have some aircraft route that way, straight ahead with GOSAM and the usual late turn for GRICE, that again increases Capacity to around 41/hr, but the issue is we have Kirknewton in the way and we could only ever use that when Kirknewton wasn't active, and we've had feedback from them saying when we aren't there please come across the top, when we are there you'll have to route round so would we design another SID that routes around it, of course we would, because that's the sensible options, but the question is do we want this SID that cuts the corner as well as, and that's a debate that we would have to have internally with Air Traffic here, but again we are looking at all options and this is an option.

R24 – 3 Exit points TALLA via North –

Now Runway 24 but this time routing TALLA to the North, so we've got 3 departure routes going straight ahead, like we do now, but instead of TALLA turning left it turns right. The reason for this is it climbs, gets above all of the inbounds with plenty of space, so that's good from and airspace point of view but it's bad as there's a lot more track miles and it starts affecting communities to the North, so good from one point of view in that the airspace is a bit more straight forward, but bad from the other point of view in that it affects communities to the North.

And then R24 with an early turn for TALLA and GRICE, this gives us a Capacity of 41/hr again, but the question is can we turn right early because we have Winchburgh and various other communities of to the Northeast of us which makes it difficult for us to justify and routing to GRICE & TALLA to the north again we get the same Airspace issues north and south with further track miles. In our long list it's a possibility that we've thought about, but we need to appraise it, get your feedback, but if we can increase capacity with what we have at the minute why would we send the TALLA track to the north.

R24 4 exit points 'East' via North – We'll now look at R24 with 4 exit points.

Everything goes straight ahead as if it was on one route. And then we need to get to TALLA at some stage, GOSAM, GRICE and the EAST, but we're turning these away from the airfield, sorry at a distance from the airfield, not immediate right or left turns. Those distances will be where the least populations live.

We have3 a left turn for TALLA, right turn for GRICE and a right turn that kind of follows GRICE and then right of to the EAST, and the capacity there again is 36/hr, because they're all kind of the same route and we can reduce that departure interval.

We thought about the early left turn for TALLA again, but you've got Kirknewton in the way but instead of 35, 36 capacity you have 41/hr. Again, it's something we'll look at I think, but there needs to be a very stringent safety case for routing that way with Kirknewton out there.

Now we look at splitting the SIDs a little bit. You have GRICE, GOSAM and TALLA going straight ahead, and EAST has an early right turn. So what that means is our Capacity increases to 41/hr just with the EAST SID going right early from the airfield then it increases our capacity which is a good thing from the Airports point of view but as I've said it goes nearer to Winchburgh and various others to the north so there's some analysis we need to do and again we will look for feedback on all of this so from a capacity view point its good but from design principles re population overflown it's not so good

And then a fairly complicated one we 've got GOSAM and GRICE both going straight ahead with a late right turn for GRICE, but we have EAST and TALLA turning right early and hopefully routing over the unpopulated or least populated areas of Fife and turning right or carrying on. Is there a benefit to this, well the capacity is 42, but what we are doing is perhaps flying over areas we don't need to fly them so again this was in our long list of options, for a reason, its good from an airspace point of view but possibly bad from populations overflown, and track miles.

R24 4 exit points 'EAST' via South – Now we'll look at 4 exit points, when we turn left, going to the EAST, its an option that we needed to look at,

We've got GRICE with an early right turn, GOSAM straight ahead TALLA straight ahead and EAST straight ahead, as if they're the same SID but turning left as and when we can, and subject to population on the ground. The EAST SID has to come back around Kirknewton really and there's a big star here about Airspace issues with inbounds for 24 coming from the south. So, you think you'd prefer the EAST SID to actually go to the North and avoid all the inbounds unless it could get a lot higher than the inbounds in the track miles and flying this way and south and left again it could probably achieve that, but it needs some more analysis.

And again, just to show you, if it was an early turn to the EAST your straight towards Kirknewton and left and you've still got the problems with the inbounds from the south, but Capacity's gone up to 42 there instead of 28 with an early right turn for GRICE and a couple of SIDs going straight ahead.

As I explained these are all in our long list of options and we're combining the SIDs because we need to combine them to look at the Capacity figures, you can analyse the SIDs separately, but they need to work together so that we can get an accurate capacity figure.

And again we've got GRICE here with a later right turn, TALLA with a late left turn and EAST with an early left turn, with Kirknewton and the airspace issues, the capacity there is similar to the previous one with the early right turn to GRICE, so there isn't a lot of difference there, again that's something we'll have to look at whether the early right turn to GRICE is advisable or not, again not a lot of aircraft go to GRICE but they are building a lot of houses just to the north west of the airfield.

Just to finish this bit of just after departures, there are multiple options for R24 departures and combinations of SIDs, I've not shown all of them purposefully because I could sit and describe them for another 10 or 20 minutes, but what I will do is put them in a PDF document with the rest of this

presentation, and you can see them in your own time, and give us some feedback. Hopefully doing it this way you've seen the capacity numbers those that we can achieve with the SID variations, the higher capacity if you can bring the aircraft closer together and I know that at Edinburgh Airport itself, when your sat at Edinburgh as a controller with another controller you can use the 3 mile separation but it's when your sat at 2 separate agencies you have to provide safety cases and there are some occasions when you can reduce that to 3 NM but it's not a matter of course, and it involves a lot more conversation between the people here in the tower and NERL and us to see if actually we need that capacity or if we can cope with 5NM. I think that s one for the future and something to programme in to look at the capacity in 5 to 10 years, because I think we have enough capacity to take us to 2027, and that's probably a conversation to be had a little later down the line to see if it's a possibility, but it's interesting to put the capacity in here with the 3 NM as we've done that work already and if people need to know then they can look.

I think just to finish of departures this isn't necessarily on departures but I want to give it a little mention that the requirement of airspace users our DESIGN PRINCIPLE 14 should be taken into account when designing flight paths, also what I've shown you is all the options there, most of the options for departures, When we have the final design for those flight paths we are going to look at where they are and where we can perhaps give back some controlled airspace to users, and I know I've contradicted myself with cutting the corner at GRICE, and there's a few issues later on where we may need controlled airspace. But if we take some from somewhere we'll give it back somewhere else I'm sure, but we don't quite know yet as we haven't got the final flight paths and done the final analysis. That's something we'll have to take into account certainly in stage 3.

We need to look at the classification of airspace, which I am sure will stay as Class D because it needs to, but we'll look at reduction of our airspace volume and possible revision of any LoA's and standing agreements. To make our design work, so I want the most improved efficient design, for Edinburgh to come in, and if we can get that I'm sure the control zone itself can be looked at for more efficient use.

This is the response we had a while ago now but just to reiterate that we are taking this onboard, and that the GA community have had their say on it, our airspace and that they'd like us to reduce our volume if we can, we'll need to design the flightpaths first, look at where our approaches are going to go and then see if there's any airspace that we don't think we are going to use and that's the way I think to do it intelligently.

I'm now going to take a Break for 5 minutes or so. If anyone has any Questions please put your hands up, I'm about to stop sharing my screen.

In summary there were quite a few, we've gone through most of them for R24 and all of them for R06.

Questions -

SIMON - David I think you've got your hand up

[redacted] (BAA) - Yes, excellent, just a quick question on the departures are we going to get some of the numbers on track miles? Then we could do a fuel departure calculation on some of them?

SIMON – yes so, James you might want to come in and say something about that. What we're trying to do, and I'll come on to this a bit later actually, some of the SIDs the point where we connect with the network are going to change a little bit. Then we will be able to look at track miles much more accurately. We know that our GOSAM SID to the west joins the network and virtually gets all the way to Glasgow actually, we are looking to truncate that to join the network midway between us and Glasgow, so that you can guarantee your left turn earlier. In stage 3 three there's a lot more numerical analysis and we will be able to do that then. James, do you want to say something on this?

JAMES (WSP) - that's right, stage 3 will be more numerical, at this stage we will have quite a large band I suppose and will look at the inner and outer curves of those, Simon, just to give us an indication of track miles, and put that into that stage 2b assessment.

SIMON – Are there any more questions at this stage?

Ok we will take a break now and be back around :55, when we return, I'll talk about approaches, and Environmental design principles, and James may wish to say more about that. Thanks for your attention and we will continue in about 7 minutes or so.

BREAK

2nd Half of meeting

Welcome back, I'll share my screen again and share the presentation. And we will have plenty of time for questions at the end.

As I said I'll get the whole presentation together with a feedback form and send that out, hopefully you'll reply, and we will take it from there thank you.

Arrivals and Approaches – 52:06

Simon – When we look at Arrivals and Approaches there's 4 options we look at

Holds to Vectoring which is kind of what we do at the moment, missing out the holds if there's no need

Some vectoring and some systemisation

Full systemisation, which is Holds, approach transitions and then RNAV Approaches. Or

Point Merge – we looked at Point Merge, put it in our long list and thought it's going to need a large volume of Controlled Airspace, reduces our flexibility, puts aircraft rigidly 6 miles apart, which means quiet periods of the day when you could have inbound aircraft 4 miles apart with no departures and basically be more efficient. Would involve a change of culture at EDI. Was an option we looked at but don't think it's appropriate for Edinburgh. But if you do think different, please feed that back, if you'd like an example look at the chart of London City

We are looking really at the other 3 options

Current patterns orange = arrivals

Here's a look at current traffic in our Zone. Again, we have the zone with the 2-mile buffer,

A lot of our traffic comes inbound from the South. Goes to the TARTN Hold if necessary and then is vectored in. There's no systemisation at the minute and generally will land and INS or NDB or Non-Directional Beacon if the ILS is offline for any reason

That's the pattern at the minute, Arrivals in orange we can systemise that to concentrate tracks or keep a similar modus operandi and continue with the vectoring.

Having spoken with the people in the ATC tower a mix is what is needed.

So that's what the tracks look like at the moment with Departures in Blue.

Runway 24 (R24) – 2 approaches

Systemisation will look at 2 routes, we have a hold North at STIRA, and south at TARTN, if we are to systemise this with RNAV transitions and RNAV approach, this is kind of what would happen – an aircraft would leave the hold, it would fly the RNAV Transition, which is a line on the chart, using RNAV navigation, coming over the overhead and do what's called a downward leg to join the T-bar south. So RNAV approaches normally have a T-bar here and they would fly in turn left, left again and in. And from TARTN its pretty straight forward it's just fly in join the T-bar and left.

I mention this because if you wanted the T-bar to the North, traffic in from the North, the Northern point of that T-bar is pretty close to controlled airspace, which is why there's a big warning star there, and it's too close to the boundary. Overhead to join the pattern is the preferred option/ procedure now really. There is an alternative of course, where you move the controlled airspace up, and fit your T-bar in, however, the light aircraft community to the north may have something to say about that. We can look at the number of aircraft coming from the north and can we justify that against our Design Principle – helping all airspace users. It's an interesting balancing act, and an interesting conversation to have. People on the call will wish to feedback which I hope you do.

There's and alternative which I've just shown you where traffic route to the overhead and is systemised. At the moment we cope with aircraft being vectored to the North so it's not critical but it's an option, we came up with a long list of options and so we put it in there as it would be remiss if we didn't.

R24 3 approach routes – Inbound from TARTN, approach transition to the T-bar, and approaches from the EAST, and again to the north the controlled airspace isn't big enough for the T-bar so what do we do, we bring it through the overhead and downward Left.

If we don't get the controlled airspace, we can manage with vectoring and manage with systemisation

R06 2 approach routes - R06 3 approach routes – I might come back to those approach routes, but I'll certainly put them in the slides. To save a little time for Questions at the end.

For 06 it's really straight forward and like I've missed out some of the R24 departures

We will move onto this which is something that I need to mention, it looks complicated, but I'll explain. What we are looking at are combinations of inbounds and outbounds, and we've tried to represent this in the least confusing way, our SIDs at the moment go to GOSAM, we are looking at environmentally friendly SIDs if you want to put it that way avoiding population centres, still going to GOSAM. But what we are trying to do with the assistance of NATS, NERL is truncate GOSAM and make it shorter. The GOSAM SIDs currently away towards Glasgow. What we are going to do if we can, is move it closer to here. So that aircraft departing GOSAM go here and then can be guaranteed a left turn to the network, so a question I had earlier was about track miles, this is one way of planning perhaps for less track miles, in that you can plan for your SID which finishes here somewhere, on track to GOSAM and then turns left down the network, instead of planning for a SID that goes all the way out to Glasgow. This is about moving exit point s and hold points to facilitate NERLs airspace change, but it has to of course work for us too.

We have had conversations about the TARTN hold possibly moving it 5 miles or less, not noticeable however it would minimally affect traffic below 7000ft. it's something we will need to do in the simulator because NERL are looking at our TALLA tracks coming off R06 coming out this way and down to the southeast and missing the hold somehow, to do that they need more controlled airspace down to the southeast. So, this slide is trying to accommodate what we are working with NERL on.

Also, out to the EAST we need more controlled airspace here, and we'd need a stepped airspace here, I've not shown it here because we don't know quite where it's going to go if we get one, its certainly something we'd like which is why the EAST SID is illustrated here.

Finally, the STIRRA Hold we have inbounds here coming this way from STIRA. This is currently a joint hold with Glasgow, we are looking at making that a uniquely Edinburgh hold and also looking at how our GRICE departures fit against that, so looking at a safe operation and if we systemise it making sure that they are separated in the skies there.

Low level Hold Options – this looks a little complicated but just to mention everything, in a long list of options this is why this is in. TARTN here to the southeast I've said it might move, STIRA to the Northwest might move a little bit. And we have RNAV approaches to both runways. So, you ask the question, if an aircraft perhaps bursts a tyre on the runway what happens to the next inbound? You design what's called low level holds that are only ever used infrequently, we illustrate them here in that we are thinking about them, so that when we come to public consultation we should have the best solution for where aircraft go when there's a temporary blockage, an aircraft want to be vectored round to land again in 5 minutes or so that's not really an issue, but if its 20 minutes delay we have low level holds that are used infrequently but again we need to design them in. Which is why they are illustrated in this slide, it's a case of telling you about everything and leaving nothing out.

Airspace boundary change EAST departure and / or arrival route – we spoke about the airspace boundary if we get the SID to the EAST, we will need controlled airspace out to the EAST somewhere

and a stepped airway so we can allow aircraft to also arrive from the EAST. Again, the Track miles there and the fuel savings are phenomenal. The hindrance to this is the Ministry of Defence with the large danger area further to the east than what we show on the map here, but they only use that around 6 weeks of the year, so we will be able to use the EAST SID most of the year and the rest of the time make use of TALLA or GRICE.

Further Design Principles –

Moving onto our further design principles that I haven't quite mentioned yet, once we get these passed what we need for Arrivals and Departures we then apply these further design principles to them so that we can minimise adverse effects on Health, Quality of Life, created by aircraft noise.

In stage 2 it's something we write about and in stage 3 we analyse with numbers, and that's kind of the difference in the way that we look at it. For noise there are a few slides for this and they all link to each other. We always look at continuous climb, continuous decent, and routing the flight paths away from population centres, I've already mentioned Edinburgh, but we are well aware of communities on the southern coast of Fife, Cramond, Livingston etc.

We look at noise, we look at Air Quality, because that's one of our design principles, and also Tranquillity and Quality of life, and all of this is to do with where the flight paths are going to go, the mapping and what actual areas are going to be overflown. At the moment its flight path options, and this analysis is done in a written way but later in the process it will be analysed and there in the public consultation

Another of our design principles is Noise up to 7000ft, unless once you get to 4000ft you are not overflying anybody, so for example over the Firth of Forth, and so can turn.

Another thing we look at is Air Quality and Carbon, which is basically the length of a flight path so flying less track miles is preferable, so if we can shorten the SID that's a good thing, also the way aircraft depart might be something we can look at and the use of 90 seconds which I mentioned earlier. They are all in the mix, at stage 2 it's all about lists of options and trying to refine them and going forward with a sensible number of options in the short list that you can numerically analyse

FDP9 – flight paths should be deigned to minimise population overflown below 4,000ft and between 4000 and 7000ft taking into account any potential adverse impact, due to those overflown having protected characteristics, as defined by the Equalities Act 2010 (Health and Wellbeing) – so again noise and minimising population overflown contributes to reducing the noise effect, People with these characteristics are assumed to be widely distributed except for obvious clusters. I've listed the protected characteristics at the bottom there and basically, we won't design a flight path with biased to any of these people, this is quite a difficult one really, but if they're e.g., retirement villages, and we know about in Kirknewton then we will try not to or minimise flying over them, as it's there and a design principle we will try to take those into account

FDP10 – Again this will depend on the flight paths, we are not quite at the stage of drawing lines on the map, it's just taking the options through the - you'll have all the options – what do you think.

Again noise, we have plenty of maps we can look at, contour mapping we can do, and we will need to do that for stage 3.

At the minute it's a case of looking at maps and thinking this is the best route thorough, there's some analysis to do in 2B which WSP will do, and James is going to talk a little more about that, at the end of the next few slides.

We look at noise, tranquillity, we have maps that show noise sensitive receptors on them, schools hospitals care homes etc, but I am also talking with our local communities, and they have local knowledge, there's a school that's going to be built at Rosyth, we have country parks at Dalkeith, we have issues at Dalgety ay, so as well as the maps there's the local knowledge we can use as well

I've spoken a little about track concentration and dispersal, SIDs will be concentrated by their very nature, track dispersal - will keep the radar vectoring for dispersal.

I think it interesting that it mentions respite there, respite is something that is timed, and you have to schedule respite. For instance, could we use only the quietest SID at night? In which case that would be planned, not controversial but is it technically possible? We can possibly design in respite e.g., routing aircraft along M8 corridor instead of towards Livingston, using Firth of Forth as much as we can and avoiding the population centres on the Fife coast, we will describe the various options as we move through the process and analyse them at stage 3.

We looked at timed SIDs but there are human factors here, again we will talk to tour people in the ATC tower, I have listed all options for SIDs, but they aren't particularly favoured in feedback from Prestwick Airport, who said that they are very difficult to implement. If it involves a risk, we won't take the risk we will just do something else.

Dispersal – PBN is pretty accurate – but aircraft do all have different performance so there will be some distribution in turns and especially close to the airfield if we decide to go with those options

Vectoring – we have considered, on the flight paths up to 7000ft its predictable where aircraft will go, and they have been designed for the minimisation of noise so why would you take the aircraft off the SID up to 7000ft. There would be exceptions to that with aircraft out over the Firth of Forth where no one lives but this will be designed in.

Approach vectoring – this leads to dispersal also.

FDP12 - Fuel burn –

Up to 7000ft its noise, above that its Carbon, we positively encourage Continuous decent and Departures which we achieve on average 100% of the time. We will look at the comparison of track miles and then look at what we can do to enable the aircraft to flight plan to use less fuel.

FDP13 – This leads on from the last one Efficient and effective route management, we look at end to end distance, continuous climb continuous decent operations, and allow airlines to fuel accordingly, so want the best solution as we move forward. Carbon reduction and fuel reduction are the metrics to use to satisfy this design principle.

FDP15 – James may want to speak a little more on this but – Local AQ happens below 1000ft, we look at that in stage 3, In stage 2 we mention what we would do about it with the analysis in stage 3. Our flight paths are unlikely to change much below 1000ft. It's something we will look at and be aware of. James will say a little more on it once I get past the next couple of slides.

ACP – the approach to AW assessment - and again this is the hypothetical area we would look at for AQ. So, landing R06, aircraft tend to be below 1000ft, and departing R06 this is where they climb up to1000ft. so it's just in those areas there that are really affected and the opposite for R24.

FDP16 – AND THE FINAL Design Principle we are going to talk about is – maximising capacity in order to contribute to economic benefits to Scotland, including tourism. –what we really need to do for this is to try to stay ahead of the game in designing the aircraft that want to come here at the time they want to come here and keep that capacity. As well as Airspace change there's a couple of things the airport are thinking of, I will say as an aside – looking at the 3NM separation, also perhaps rapid exit taxiways (which is a capital expenditure for the future) which would get landing aircraft of the taxiway faster.

In conclusion –

I've spoken about Capacity, all the departure options, or most of them, the rest will be in the presentation handout, all of the arrival options, restrictions on routes like not flying over Edinburgh, Kirknewton, the effects of not expanding our Controlled Airspace and what that would do to us and the effects of what new controlled airspace would have. And I've mentioned all our design principles and how they are approached in stage 2. Qualitatively – which is you'll have design options like I've shown you schematic so that you know where this is going to go, and then we will write about them ai9n our design principles evaluation and also in Stage 2b, where we will talk more about what we will do for design option appraisal. That concludes what I'm going to say, Let's move onto the final slide – we will go to next steps in a moment – let's just go back to AQ and Noise and that kind of stuff and I'll stop sharing and just ask James to say a few things on these design principles?

JAMES- On the AQ as Simon has said, CAP1616 states AQ impacts are going to be limited to below 1000ft, and aircraft hit 1000ft very quickly after take-off and are on a fixed and stable approach as shown by the green area in the previous slide, there's not much that can be done about local AQ. Other than in Stage 3 an assessment of whether hold times are reduced on a runway, which can help to reduce local AQ emissions. And also looking at the number of aircraft movements which happen as result of increasing the capacity.

In terms of noise, it's a very complex subject, lots of stake holders with lots of concerns, and it's a case of trying to minimise the total adverse health impacts of noise as required by guidance, Prioritising noise over anything else under 4000ft and up top 7000ft where that doesn't have a disproportionate impact on track miles and CO2. In stage 3 there will be detailed Noise modelling contours which we can analyse in detail. Stage 2 will be Qualitative using the existing mapping for population density to give an indication of dense population areas and how we may be able to avoid them and build up a picture of the differences in the various flight path options,

SIMON – Thanks James.

I'll just move onto the final part of the presentation then we will move onto Question

Next Steps-

NERL ACP – Just briefly this is next step – we will finish stage 2a / 2b and submit them to the CAA, with NERLs ACP they are looki9ng at simulators later this year, how much systemisation, traffic flows in upper airspace, and Sector Capacity so that if we increase our capacity to 35 instead of 30 that means that NERL are dealing with more aircraft per hour and can they cope. We are looking at the SID connection points and will need to work out accurately where to put those into NERLs simulator, and also inbound - we kind of discussed Point Merge I don't think we get the capacity from that one and we would certainly need a lot more controlled airspace, most of arrivals are form the south but do get arrivals from North and they won't want to join point merge leading to a hybrid system, it would complicate things. I think Vectoring and Hold positions for us is the way forward.

EDI ACP - Capacity – we've investigated our safe departure intervals and reducing them from 2 minutes to 1 and a half minutes, looked at where we can split our SIDs, close to the airfield or further away to give us capacity. But looking at noise and its affect and where people live, although we'd love an early left turn of 24 but we have Kirknewton, who are not overflown at the moment, they'd be a new area overflown, and Winchburgh likewise for early right turns, so it's something to bear in mind for noise which is a priority below 4000ft

We've defied our route options we've shown you our long list of design options, we will whittle them down and look at how we present them in 2b, we have our capacity study findings, we are looking at our environmental aspects and are just working through the Stage 2 airspace change process,

The Qualitative appraisal Stage 2b we will apply design principles to our options.

The next formal stage of the process will be Consultation in around 1 years' time, but I'd like to keep you informed as we go along.

I'll be sending you out a feedback form and copy of this presentation in full today, we'd like your feedback by Friday 17th June, which is a week after the event at the Hilton on the 9th of June in person.

There will be another of these presentations on Monday

I'll open up the floor to questions -

As I said we would appreciate the feedback

SIMON - [redacted] EANAB you've put your hand up?

[redacted] EANAB – Yes – Arrivals, the first slide you had with the T-bar, it was more the ones coming from the north I was thinking about – assuming the EAST route over the Fourth is approved, have you considered that some of the arrivals from the north won't be coming down that way, but may be coming from the EAST over the Fourth. Indeed, if they're coming from Aberdeen direction, they could fly down the coast and come in that way?

SIMON – They could indeed, that's why we put the 2 options up there, the full T-bar with the arrivals from the north is desirable but it needs to be justified, with numbers of approaches, because we understand that moving that controlled airspace to the north isn't a great idea for some people. We have to be diplomatic and understanding about these things. It will be one of the items on our long list but whether it's taken any further is another question, but I agree that aircraft from the north could route in to the east and just come straight in. We've put in as many alternatives as we can, but we do need to narrow them down. If we did take it forward, we would have to justify the numbers.

[redacted] EANAB – It just seemed that it would reduce the numbers coming in over land from inverness or whatever and so the need to extend the controlled airspace may not be so great in that circumstance

SIMON – Yes indeed, we've got some maths and predictions to do, and on GRICE as well, if we get the SID out to the EAST that will affect the numbers on GRICE, I am sure, so some maths to do there as well. We keep GRICE in of course because if we don't get the SID to the EAST then we will need GRICE. We also need GRICE for when the SID to the EAST is blocked by military operations.

SIMON – Thanks Andrew - Any more – David?

[redacted] (BAA) – Just regarding that eastern SID, I know there have been other discussions with NERL about the potential for a further southern airway which would benefit us, do you know if much has been done regarding a link up of those with of an eastern SID and a further eastern airway??

SIMON – I'm not sure if NERL could answer that, is this about controlled airspace to the southeast of us to enable the TALLA departure?

[redacted] (BAA) – We've had discussions for a number of years about the possibility of putting a further southern route airway that runs down the east of us basically, so that would benefit us quite a lot, it's obviously quite constrained due to the military activity but it could be rather useful when some of that airspace isn't in use by the military, just wondering if that Eastern departure idea was linked in with that.

SIMON – I don't know if Nick maybe you want to answer that? I know that NERL have asked for some more controlled airspace down towards the southeast towards Newcastle to enable our TALLA departures to route that way with a little more ease.

[redacted] – NERL – We are currently refining our options development work to take to very high-level simulations hopefully at the end of this year, and all those kinds of options including down the

east there I will be talking to the military about. Obviously slightly complicated when the military want those back, but we take the view nothings of the table to kind of make the airspace more efficient for everybody so that kind of concept is in there for consideration.

SIMON – that's great thanks, anyone else?

[redacted] EANAB– just on that last point we had often talked about a route down the east coast, so I am delighted to hear that its being looked at, Great.

SIMON - anyone else, any more questions? No, well thanks everyone for attending today, virtually. As I said we have an in-person event at the Hilton in a couple of weeks, and I will send you the fuller presentation in PDF form as it takes a lot less memory, and also the feedback form, if you could get those to me to the Airspace email address. Thanks again for listening and I look forward to your feedback when it comes

END OF MEETING – Duration 1 hr 29 minutes.

Attendees:

Name	**Company/Representing**
[redacted]	Prestwick
[redacted]	NATS
[redacted]	NATS
[redacted]	NATS
[redacted]	NATS
[redacted]	NATS
[redacted]	Edinburgh Airport
[redacted]	WSP
[redacted]	British Gliding Association
[redacted]	EANAB
[redacted]	EANAB
[redacted]	Fife Council Environmental Health Officer
[redacted]	Burntisland community council
[redacted]	EACC
[redacted]	Sestran EACC
[redacted]	EACC
[redacted]	WFS
[redacted]	British Airways
[redacted]	Trax GLA ACP
[redacted]	Trax GLA ACP
[redacted]	GASCO
[redacted]	Scottish Gliding Centre

[redacted]	Winchburgh Developments

Engagement session 2

30th May

Edinburgh Airport ACP Stage 2 Engagement Session-20220530 1256 -Meeting Recording - transcript of meeting

Meeting started 12:56 30th May 2022
Attendees to the meeting are detailed at the end of the session

Simon Rhodes (SR) – Good afternoon, everyone, I'll just say hello to Alister John and Paul and wait for others to join and kick off in a few minutes

Good afternoon, everyone, just a reminder I'm Simon Rhodes, we will start in a couple of minutes.

Thank you for joining I'll go through the presentation I have, there will be a break after around 45/50 minutes and we will come back and finish the presentation, I'll start sharing my screen and you should see the Title page, can I just say I am recording this purely for note taking purposes, and to make an accurate record of what's said as we need your feedback

Today's engagement is to do with STAGE 2 OPTIONS DEVELOPMENT AND STAGE 2a IDEAS ON DESIGN PRINCIPLES.
We will move through the slides, but we should be able to move through them quite quickly Please feel free to ask questions we really appreciate any feedback that we get.

Just a quick Recap we are doing our Airspace Chang and we are in Stage 2, todays presentation will begin with this recap then, we will look at our Capacity and how that has changed post-Covid, we will go through our Departures then Arrivals options then I'll talk a little bit on Environmental Design Principles,

(Programme Approach CAP1616 Slide) So this is where we are in the programme at the minute, Stage 2 Develop and Assess, step 2a Options Development, this is where we look at every design option possible within reason, we then appraise them in step 2b with a little more information given before then being ready to submit them at the end of Stage 2

Stage 2a Options Development
we need to develop one or more options that address our Statement of Need and align with our defined design principles and identify all possible route options, we've tried to do that, and we will show you that this afternoon.
I'll just say now and probably remind you at the end, we will send you a copy of the presentation in PDF format and a feedback form, which you can fill in and send back to us and it's something we will use as we move through our designs.
We are gathering feedback on our design options, are we applying our design principles correctly, and we are describing all options we have with capacity and airspace issues, and we are looking at possible additional controlled airspace that we would need to implement our ideas and design options and also, we are looking at areas to avoid, and sensitive receptors.

I speak to our communities every couple of weeks and their concerns are if it will reduce Noise, carbon and track miles, improve Air Quality which is also to do with carbon reduction, possible respite and also sensitive receptors. for 2B which is basically a qualitative assessment of our options we do look at some maps and software but basically what we are going to do is describe and write things before we go into further analysis, which comes in stage 3

A reminder of the Drivers for our Airspace Change is Precision Based Navigation (PBN) we want to modernise our airspace – move away from being reliant on Beacons to navigate, they are coming to the end of their lifespan, and rely more on SATNAV. And make our airspace more efficient
Another driver is Airspace Capacity so that when the airport does again growing, we can reduce delays and make it more efficient .and reduce our carbon foot
print as well

And we are also looking at the Environment and minimising our environmental impact, looking at the areas we can overfly where the lease amount of people live so reduce the number of people overflown, how and when they are overflown, and reduce CO2 emissions which we will do with less delays on the ground more efficient routes and less track miles.

And it's all about a mix, it's about mixing modernising our airspace, reducing delays and preparing for future growth with reducing Environmental impact. Which is what this slide signifies, and it's how we balance those.

Design Principles - So a reminder of our Design Principles, in the first presentation it was more high level, we talked about concepts and things, we talked about the first 6 DP's here, we looked at
The Airspace needs to be safe or safer than it is today, it must be flyable,
technically supported by ATC, and airport management systems, I do work closely with our ATC here at the airport and actually spend half a day a week hot desking in the tower.
Flightpaths must be designed to allow modern aircraft to use PBN, so our flight paths will be using PBN if nothing else when we've designed them
we are working with NATS at Prestwick and Glasgow to ensure we deconflict all of our new flightpaths make sure that they don't interfere with Glasgow's, and to make the Network above us more efficient as well.
DP5 – The predictability of flight tracks must be maximised for consistency of operations. Some of these DP's contradict other ones but, we can make flight tracks that are predictable so because below 7000ft its important to not fly over population centres.
DP6 – Something that the CAA insisted on we are now working as part of the Airspace Modernisation Strategy, with other Scottish airports generally Glasgow and NATS to ensure that our airspace fits in with Glasgow's which it kind of does below 7000ft and we are also working to make the airspace above 7000ft more efficient

FDP7 And if you can just bear with me the second page of design principles are all about Health and Wellbeing there some technical ones, environment and economy, and all complement each other really.
FDP8 – Flight paths should be designed to minimise total adverse effects on health and quality of life created by aircraft noise and emissions – so again we look to overfly the least

amount of people, we are designing flight paths to minimise the total adverse effect on health and quality of life, looking at noise up to 4000ft and indeed 7000ft that is an Environmental priority. Up to 7000ft, unless of course at 4000ft you're no longer flying over anyone, classic example of this for us is the Firth of Forth, if we are flying over the sea, we can cut down a few track miles so we will design the flight track to do that.

FDP9 – we should minimise population overflown which we will reiterate over and again and take into account any adverse impact due to those overflown having any protected characteristics
We will talk about that a little later and all the categories of the protected characteristics.

FDP10 - We will minimise flying over sensitive locations and noise sensitive receptors, schools, doctors' surgeries, retirement facilities that kind of thing. I've been working with our Noise Board EANAB to come up with things in their local area, which we have a note of, we also look at future planning applications and that kind of thing and try to minimise overflying those as well.

FDP11 Flight paths should be designed to include track concentration and/or Dispersal options to provide noise respite and we have a few options for that we think, using particular SIDs over night – the quiet ones, and dispersal – radar vectoring for arrivals, we are looking at options that will provide dispersal and concentration

FDP12 - Flight paths should be designed with routes that minimise track miles and fuel burn We'll come onto that a little bit late we've one track where we will try to truncate, and another where we can fly a SID out to the EAST and save track miles that way

FDP13 - Flight paths should be designed to ensure efficient and effective route management so publishing the relevant documents so that airlines and pilots can flight plan correctly

FDP14 – Requirements of Airspace users should be taken into account when designing flight paths – Quite a difficult one for us as we have a limited amount of controlled airspace available to us, but what we will do is look at our flight paths, look at our final ones and see in the controlled zone and possibly give some airspace back, but that's something for the future but something we are taking account of.

FDP15 - Flight paths should be designed to minimise adverse local AQ impacts – that's below 1000ft and tends to be about minimising delays on the ground

FDP16 Airspace should be designed to maximise capacity in order to contribute economic benefits to Scotland, including tourism and trade. – Capacity is one of the main drivers for us in trying to maximise that, and I'll come onto that in a moment.

The Current System -

A recap of the Current system, we've got 3 SIDs with 3 exit points, GRICE, GOSAM & TALLA, 2-minute separation between departures, which doing the maths roughly in your head give around 30 movements per hour, but in reality it's more like 28/hr

Next slide - so in the top right hand box if you look at the diagonal left to right slow aircraft behind slow needs 2 minutes, fast behind fast needs 2, and we find we have a capacity of about 28 departures an hour , but that is because each of these , it looks like we have 3 routes but we count them as one route , we have to wait for the first aircraft to go, wait 2 minutes let the second one go and that gives us a capacity of around 28/hour. We are trying to improve on that.

If you could keep the 2-minute separation in mind we'll now talk about capacity, and how its changed since precovid,

When we started air space change in 2019, we had high demand around 6 and 7 in the morning where we had multiple departures, and we were concentrating on increasing capacity to get more departures away in that first hour and a half.
The departure profile on the left 2019 you can see 28 is the red line there at the top, each line represents a different day of the week and there's a time band along the bottom there. In 2019 we weren't quite hitting 28/hr and in 2027 we are still not quite hitting the 28/hr mark so.

Things have changed form 2019 when we had lots of aircraft wanting to depart around 7am , e.g. business travellers wanting to travel to the south of the UK, or the near continent, that we think has changed because we are all doing a lot more meetings online, today is a classic example, but we will have peaks spread throughout the day, we are expecting long haul traffic to increase, if you look there , there are 4 peaks of departures, which is more typical of a major international airport, such as Schiphol or Frankfurt. You can see how its changed since 2019, but we are still touching up towards the 28/hr departure capacity

If we look at Arrivals, we can see that in 2019 we were hitting on around 20/hr and you can see in 2027 that increases to around 25/hr, and for whatever reason we are looking at Sunday afternoon being when the busiest periods are. Certainly, for arrivals. If you look at the movements together our traffic movements in 2019 on a Sunday afternoon, we weren't quite touching on 40/hr, but in 2027 we will, so Sunday afternoons in 2027 fairly busy, we have arrivals and departures a capacity of 42, and we need to try to increase that if we can. There are several ways of doing that, some involve airspace change and others that don't. I'll briefly describe one of the ways of doing that – by building rapid exit taxiways, so at the minute arrivals need to slow right down and turn left 90degrees, to come of the runway but if we had rapid turn exits where the angle of the turn to come of the runway was say 30/45 degrees, they'd be able to come off a bit quicker and the spacings between arrivals could be reduced and increase capacity

Current tracks - A quick reminder here of what goes on at the minute, you can see that on the left-hand side, Runway 06, Blue is for the departures, we get some good dispersal once they've moved away from the airfield, and the arrivals also give us some nice dispersal in the yellow colour, and you can see there mapping across the south of Edinburgh Airport on R06, R24 a little bit' more concentrated,

New Slides - .Just a couple of points to make here, there are restrictions with what we are trying to design, so if you look at this we are restricted by the controlled airspace around us with a 2-mile buffer zone which is what the shaded blue area is and if we are going to have a

design principle of minimising over flying of areas of dense population then the city centre of Edinburgh, we need to stay out this circle if not a bigger one, and also we have an airspace issue at RAF Kirknewton, which is just been illustrated there by the star, it's something else that we should miss, tends to be active during summer daylight hours, and is something we should keep in mind.

Now let's look at Departures and what we can do with those–
Current situation - Runway 06 (R06) – Departures - with 3 exit points – GOSAM via North –
What we have at the minute is – 3 SIDs we have TALLA routing north almost to the fife coast then right and south, GOSAM a left turn over the south Fife coast, and one routing up to GRICE.
And we have 3 height contours within controlled airspace, representing 2,4, and 7000ft, the orange one is 2000ft the light green 4000, and dark green 7, and a\re based on traffic flows in 2019 so things may change.

Next slide - We will move onto our departure options – you might be surprised to see this, to me this is very understandable and very schematic, and says what it needs to say, I'll show you all of our departure options and we will start with runway 06 –
So, this is runway 06 with 3 departures – the ones that we have at the moment our baseline and we have to show you these, and it's can we do anything to increase capacity and improve on what we have. We look at these three as an option and as a baseline and think One thing we've done is we've placed an arial out on the airfield that's been collecting live data, an ADSB arial, and it's been looking at the separations of our departures, and we have created a safety case where we think that we can reduce that time to 1.5 minutes or 90 seconds. We could probably reduce it further but having spoken to ATC one and a half minutes is mentally easy as opposed to 1-minute 20seconds or one minute 40 seconds, so let's go with 1 minute and 30 seconds. And if you look to the right of the slide, we think with this we can increase capacity from 28/hr to 35, and again something we haven't mentioned yet, you see here the 5NM that under capacity at the moment the standard separation between us and NATS at Prestwick is 5NM if in future we need more capacity we could reduce that to 3NM separation. With aircraft 3 NM apart, you get in the same volume of airspace your capacity increases and goes up from 35/hr to 40, we are looking at everything we can do to stay in the same volume of airspace while increasing capacity. So that's something we might be able to do in the future with the help of air traffic control
If you look to the right at the smiley faces, we think we can increase capacity with no airspace issues

Now if we slightly change our SIDs and have a GOSAM of R06 that turns left as soon as possible with the GRICE and the TALLA still being one route that means that half of our aircraft use GOSAM so that means that they turn early and you can again reduce the departure interval, which means that the capacity increases and goes up to 40 or 48 with 3NM separation. You can see that the numbers are climbing here, and we are achieving something, but if we kept with the single SID i.e., GOSAM didn't have the early turn, and continued on with GRICE you can see its now at 34/hour
Our Departure Capacity increases and no new Airspace issues or no new ones anyways, as we are nowhere near Kirknewton, we are not going by the airspace boundary, and we are avoiding Edinburgh. We can increase capacity with no airspace issues just by introducing an early turn, again I will reiterate these are schematic and you may be thinking well where are

they going are they flying over my house, we will later on use the design principles to refine these and minimise populations overflown.

And I'll keep coming back to that point probably.

And again, with R06 with 3 departure points another option is where GOSAM and GRICE turn early, and TALLA after Cramond continues straight on. If we, do it this way you can see with the 5NM separation we have 42 Capacity and with 3NM we have 49 so capacity is a little more and achievable, you can see over here we are happy about the capacity and there are no airspace issue

R06 3 Exit points and GOSAM via south - which is slightly different from what it is today - but instead of GOSAM turning Left its going right, gone around Edinburgh City centre while climbing and turning right here , capacity is around 35/hr but there might be airspace issues but instead of GOSAM turning Left its going right, gone around Edinburgh City centre while climbing and turning right here and there might be airspace issues not with Kirknewton as we should be high enough but with inbounds from the South, so what we are doing there is cutting across lots of inbounds, we could run it through the simulator and see if its higher than those, but not a great idea really, something that in our long list of options a left turn is better but we still analyse this as an option. we'd like your feedback on that, and this is what we think. We'd get 35/hr Capacity again with good Capacity but there's an airspace issue there with confliction against inbounds from the south.

And again,' this is just another looking at an immediate right turn for GRICE with the other 2 going straight ahead, but you can see that the Capacity only increases by 1, so is it really worth increasing the capacity on one movement if GRICE takes an early right turn, that's something we will have to analyse, and we still have the issues with routing around the south of Edinburgh and conflicting with inbounds.

R06 4 exit points GOSAM via North - We now go to 4 exit points of R06, and one thing as we mentioned in the previous presentation is the 4th SID out to the East, so we've included this now. And we are looking at more controlled airspace which I'll come onto later, this takes all 4 SIDs some distance away from the airfield before splitting them, so GOSAM to the left GRICE to the left EAST straight on and TALLA east and south. Capacity is increased to 36 so not by much but the fuel savings to the EAST are great

Next slide – and now we have the route to the EAST, GOSAM early left turn, and the other 3 SIDS go straight on for a while. Because a lot of aircraft use the GOSAM SID if we get a split here if you read the writing on the right hand side ' a 45 degree split' between GOSAM and the other 3 SIDs, you can see the Capacity goes up to 42/hr with 3NM separation up to 48, compared to that single SID of 36/hr, so if we get just one split from GOSAM and the other 3 we've increased our Capacity by 6 /hr and as you can see we are pleased by that – 2 smiley faces. And there are no airspace issues

Next slide – and now looking at the SIDs with TALLA and EAST going straight ahead then right and GRICE and GOSAM early left turn – slightly more capacity to the last one as there aren't that many aircraft that use GRICE, so it's only gone up a little bit and I think this is the

best combination of SIDs where we can manage the best capacity, but as I said they're all options and that's all they are at the moment.

R06 4 Exit points GOSAM via South - 4 SIDs go straight ahead, but GOSAM routes to the South, similarly we get a 36/hr departure capacity but again we have issues with GOSAM cutting across inbounds, should be high enough but again the preferred option airspace wise would be a turn to the left.

R06 again – This time with GRICE an early left turn and the other 3 SIDs straight ahead, we've increased the Capacity a little to 38/hr as opposed to the 36, 45 degrees split but it's not a great deal is it and again GOSAM cuts across inbounds and major airspace issue there.

And one thing we looked at as an option is a left turn for GRICE, with GRICE at the minute if you look a the way the SID moves – turns left and has to miss the corner here, safely by 2NM and then routes up which is more track miles, and we just thought what we would do is look at the option of trying to move the boundary of controlled airspace up to the North East and loose the turn for GRICE and come straight across, but there are major issues involved with that not least with Fife airport another light aircraft that operate in this area. It would take a lot of justification as to why it was needed. But again, because we have to list all of the options its one that we have listed and thought of, it's a case of being brutally honest of all the things we have thought of.

We now move onto Runway 24 (R24) having spoken about R06,
I'll go through some options for R24, look at some slides regarding our GA community and controlled Airspace and then we'll take a break.

Runway 24 – with the runway here and also the coastline – again we've used this altitude contour map to help us, shows and gives a good idea of populations centres areas, certainly Edinburgh, Livingston Broxburn Bathgate Linlithgow and gives us a good idea where we can put our flight paths to minimise overflying population centres.
This is our baseline, this is what we do at the moment, so GOSAM goes straight ahead and turns slightly right, not great for those people living along here, TALLA goes straight ahead and left, well wide of Kirknewton which is this circle here, so we are looking at options that routing through a gap and again GRICE turns right and heads up to the northwest
And again these 2,4 and 7000ft contours help us with where our departures are going to go.

And again, the Schematic hopefully easily understandable way of depicting our departure options.

At the moment we have 3 SIDs all going straight ahead to GRICE, GOSAM & TALLA. And again, they're treated as the same route, with 2-minute separation, which gives us a capacity of about 28/hr but because we've had the arial up looking at live data we think we can reduce this to 1 minute and 30 seconds, which is where we get the 35/hr capacity for using this runway and possibly an increase of this up to 40/hr if we ever got the 3NM approved. But you can see just using the same SIDs, with the shorter departure interval we increase our capacity, which is one of our airspace drivers.

Next Slide – the difference here is that we have turned GRICE early, which gives us one extra per hour, which may or may not be necessary but again it's an option, so what we are doing is trying to look at is where an aircraft turns and if it would give a good amount of capacity or just a little. Again, we for an early right turn on GRICE we'd need to look at population centres and whether the capacity gains is worth it to turn early but there are no airspace issue with this option

Next slide – now we've looked at going straight ahead, turning GRICE a bit later, but an early Left turn for TALLA. And the problem with that is it takes us straight over RAF Kirknewton, so we might look at a SID where Kirknewton is active and one where it's not, but we'd need ot weigh up some safety concerns. But you can see with an early left turn for TALLA our capacity goes up to 41 in comparison with 28 which is good for capacity but bad for air space.

Next slide – and again we looked at splitting all the SIDs early, So, again good for capacity, but not so good for airspace issues, RAF Kirknewton and then of course we have to think about where people are living and population centres. But again, we are just looking at schematic views and I will keep reminding you of this and that nothing has been decided.

R24 – 3 Exit points TALLA via North –
Now Runway 24 but this time routing TALLA to the North, so we've got 3 departure routes going straight ahead, like we do now, but instead of TALLA turning left it turns right. The reason for this is it climbs, gets above all of the inbounds with plenty of space, so that's good from and airspace point of view but it's bad as there's a lot more track miles and it starts affecting communities to the North, so good from one point of view in that the airspace is a bit more straight forward, but bad that it affects communities to the North. But you can see that capacity has again gone up this time to 35/hr, again this is just an option, and the point of today is to show our options, and at the end of this I will send you a feedback form and you can tell me what you thought of the options

Next slide – again we are looking at TALLA with a right turn to the north, an early right turn this time with GRICE 3a little later and GOSAM straight on, it does increase our Capacity to 41 but that's really the only benefit. Again, there are issues with track miles and routing to the East before going south.

Next slide – and finally for this 3-exit option, there's TALLA and GRICE with immediate right turns, and GOSAM going straight on. Again, capacity is 41/hr.

R24 4 exit points 'East' via North - We'll now look at R24 with 4 exit points. What we have done here is add the EAST SID in that's the one that goes out over the Forth. And it's a right turn of 24 with everything going straight ahead
We have a left turn for TALLA, right turn for GRICE and a right turn that kind of follows GRICE and then right of to the EAST, the capacity again is 36/hr as opposed to 35/hr for 3 SIDs. The benefit of this is with EAST and the fuels savings track mile savings out over the sea. So, departure capacity is ok and no real airspace issues. Again, it's another option and one we are seriously looking at.

Next slide – for this one we have an early turn for EAST and GRICE immediately, with GOSAM and TALLA straight ahead then TALLA turning left and avoiding RAF Kirknewton. Capacity goes up to 42/hr in this instance and we don't really have any airspace issues.

Next slide – Now with an early left turn to TALLA, you go over RAF Kirknewton and the capacity goes up to 46/hr, early left and right turns for all SIDs apart from GOSAM going straight ahead, and this just outlines all options which is the point of this engagement so please tell us what you think.

Next slide – and looking at another option – early left turn for TALLA with a later right turn for GRICE and EAST, with GOSAM going straight on. And a capacity of 41/hr.

Next slide – and with this one EAST turns right early, GRICE a bit later, and TALLA to the south with an early left turn over RAF Kirknewton, this gives us good capacity increase to 45/hr, I show these options because when it comes to looking at what flight paths to analyse and design, we ask do we need capacity of 45/hr, and if we go for 3NM separation can we cope with later turning SIDs. It's all about compromise really and looking at the design principles.

Next slide – We keep going with R24 Departures – this is really the baseline that we have at the moment with the addition of an early turn for any traffic routing EAST. This gives us a capacity of 411, and again we have the benefit that aircraft on the EAST route will save a lot of fuel and track miles.

Next slide – and now everything goes North again, GOSAM straight ahead , everything avoids Kirknewton to the South but turns north, but we have populations centres in Fife to the North, we have GRICE to the north, SID to the EAST and a SID to TALLA, and we come across the same track mile issues with TALLA, the capacity is also only 36/hr so you think is the benefit there for routing aircraft his way and is it worth it. Again, it's looking at all options and looking at what we need to analyse further.

Next slide – on this option we've turned TALLA and EAST immediately, a late turn for GRICE and GOSAM straight ahead, and we have the same airspace issues with TALLA and greater track miles, but have a capacity of 42/hr,

Nest slide- on this option we have everything but GOSAM on an early right turn, with traffic routing to TALLA via the east giving the excess track miles, where its much quicker to go via south

R24 4 exit points 'EAST' via South – Now we'll look at 4 exit points, instead of turning north to go to the EAST we are turning south to head to the EAST, it's an option that we needed to look at,
As you can see capacity is 36/hr which is similar to the baseline, and we probably have airspace issues there with RAF Kirknewton and inbounds from the south.

Next slide – On this slide we certainly have issues with RAF Kirknewton if we take an early TALLA turn to the south and EAST routing to the EAST quickly with airspace issues with our inbounds from the south, capacity is 45/hr but is it worth it when we are cutting across air traffic and RAF Kirknewton as well.

Next slide – as I said we are running through all the options here so on this one we have and early right turn for GRICE, early left turn for TALLA and EAST, straight on for GOSAM and capacity is 46/hr which is good, but the bad things are your flying over RAF Kirknewton, cutting across the inbounds and do we need the capacity of 46/hr

Next slide – this option looks at a later turn for TALLA and EAST, early for GRICE the capacity is 38/hr and again the EAST track cuts across the inbounds.

Next slide – On this option the EAST SID again cuts across RAF Kirknewton, but the capacity has gone up to 42.

As you can see, we are trying to come up with all the feasible options but what we haven't done is send EAST to cut across GRICE which isn't safe, so we have disregarded those as options,
We've looked at our baseline, R24 we've looked at whether we can send the EAST route via the north or the south, and on R06 we've looked at whether we can send GOSAM via north or south.

Just a couple of more slides before some questions and then a break

FDP 14 should be taken into account when designing flight paths,
Other airspace users are GA, Military transiting aircraft among others

Their requirements are the classification of airspace, which I am sure will stay as Class D because it needs to, reduction of our airspace volume and possible revision of any LoA's and standing agreements, some of the feedback we have already received from RAF Kirknewton is that when they are not there we can fly over, but there are certain safety implications with this and we are looking at this with ATC and seeing what we can do or whether we want to do anything or just route the SIDs round Kirknewton

Responses related to Edinburgh Airspace - This is the response we had a while ago now but which we will look at as we move our designs forward. We have airspace which is structured around R24/06 and also around the 12/30 runway which is now closed, there are some statements that EDI airspace is excessive in comparison with other UK airports and some areas of it underused.
We looked at the slide earlier and the arrivals and departures and maybe there are some gaps there that we can look at, first we'll need to design the flightpaths against our Design Principles and then we can look at the volume of controlled airspace required.

Ok we are going to take a break and I will stop sharing my screen.

If anyone has any questions, please ask –

I'll just reiterate, we ran through all the SID options there and what I will do is send you a copy of the full presentation with a feedback form within 24hrs

[redacted], EACC you have your hand up –

[redacted] EACC– just to ask going back to the very beginning on the slides on capacity, obviously there's variations in capacity during summer and winter because a lot of services are summers services only, that then is an average, is that then take into account because there will be big variations

SIMON – that capacity was looking at the peak for 2027, and we would design for 10 years' time, so in about 2 weeks we have a 10-year plan coming out, and we'd look at those capacity figures to and say would our airspace be fit for the capacity for 10 years hence. Those figures there were for peak summer, and the Sunday afternoon one is the busiest we'd certainly design for that, because you wouldn't design for an average you design for peak capacity which is what we need, so we keep delays to minimum and have everything as efficient as it can be

[redacted] EACC – the other question was to do with time of day – obviously that's a big consideration, with night flights and that side of things,

SIMON – so we have Respite considerations with in one of our Design Principles, we will come onto this later but we can design in respite, a classic example to me is the GOSAM SID so at the moment it goes straight over towards Livingston, if we turn it right a bit after departure it goes along the M8 corridor, therefore you are then giving respite to Livingston residents from those departures, so you can design it in I think, And also time of day, in CAP1616 night is defined as 23:00 and 07:00, so during those hours would you only allow aircraft to use a particular SID, that is the quietest, so that is up for debate, it's an idea. So that's a couple of things we can look at. Thanks Janice
Graham, I think you have a question?

[redacted] SRUC– hi, just a couple of quick ones – FDP10 there's working in there that seems almost at odds with one another, if the aim is to lessen flying over population areas FDP10 says to reduce flying over green spaces,

SIMON – Indeed – so there's a few there's respite and dispersal, and greenspaces and population centres. From our communities, population is the big concern, if we can avoid overlying areas of tranquillity then we would do that as well, James will talk a little on that later. Some of these are a little contradictory but they came out of workshops, where people want more capacity for tourism but want dispersal, but the CAA policy is concentration, so to me it's a balance, it's about compromise and balance. And if they're are particular green spaces that we shouldn't be overflying for whatever reason then we won't overfly them, it's about not putting flight paths over new places as well, you have the Pentland Hills, you could take a turn of R24 and go directly over them, not many people live there so it'd be great from a population point of view but they aren't overflown at the moment and people would say you've ruined our tranquillity. Life's all about compromise and where we get to is a good question really. I realise that I sound like I'm sitting on the fence here, but I'm purposefully doing that because if I say we are definitely going to do this or that I might come a cropper later in the process, so it's about a compromise really.
Hi James, not sure if you want to say something on that

[redacted] WSP – I was just going to say that the governments priority is about the minimisation of the impacts of noise in communities, and so where we can achieve that then that is what the airport wants to do, there's an opportunity of minimising the overflight of

areas of outstanding natural beauty and national parks which I don't think apply in this region because there aren't any, there are areas of tranquillity where we would try to minimise overflight, and like Simon says it is a massive balancing act to try to get the best option on all of those considerations and we have quite a challenge ahead of us

[redacted] SRUC- Just my second one if I may Simon – In your diagrams there one doesn't imagine that passenger aircraft have got the same accuracy of the red arrows so those double ended arrows that you were showing in some of the slides is that the width of where they would be flying?

SIMON – Those are to illustrate that we could fly at some point between these arrows, and it would be at the most optimum place so where population centres ended, we design it to take into account the design principles bearing in mind tranquillity and population centres

SIMON - [redacted] do you have a question

IAN LAA – it's just going back to the discussion on the last question and it's from the workshop where we talked about weighting against the design principles, and I know you said you're going to move to the Quantitative shortly, but at least at this stage and I know you said you're going to ponder some of the imponderables shall we say, but if you had a rough cut at this stage it may help us as the audience with understanding the weightings in the draft stage at an earlier stage. Would that be useful and is that going to be done?

SIMON – I'll take that away, JAMES do you have a comment on that? At this part of the process are looking at the options and seeing if we have applied the design principles. I understand where you're coming from7, to me we follow this process, we come up with early options we apply the design principles, and theoretically the next engagement is the public consultation. But frankly it would be remiss of me if we didn't come back and say, 'this is what we are doing next', so I think there should be more engagement before the public consultation. But in the CAP1616 process it's not necessary. We are fulfilling the requirement her and actually doing a little more, I think. But your right with the weighting what we need to do is look at the possibility of the options, hopefully common sense will play a part in it but if there is anything controversial it's for us as an airport to think about that, w3e have strategies and one of those is to be a good neighbour, and it might be something we need to come back and engage on in the future, because as I said there's this engagement which goes a little beyond what we were supposed to do at stage 2, and the next bit is public consultation. To me there's a bit of a gap there. To me it seems a bit remis not to come back to you before consultation

[redacted] LAA – It'd also be a good way of demonstrating at an early stage the compromises that have been made.

[redacted] WSP – I should say there's as well no requirement for weightings per sei, but we did apply a degree of weighting in the wording of the design principles, where we had must, should, could, and that takes into account that there is some balance to be made as Simon has already stated.

[redacted] LAA – yes there's 2 stages to it, the weighting but the application at this stage in rough cut is something that's useful too. It helps explain why decisions have been made and gives you as the designer potentially more insight and gives us potentially more insight into the compromises you have to make. I've got more but we can come to those questions later.

SIMON – [redacted] SRUC?

[redacted] SRUC– I know you r going to say it's just a graphical representation, but what I did notice is that in a lot of the charts for runway 24 the right turn for the most part was showing up tighter than the left turn? Now had the left turns been a bit tighter then it would potentially have missed Kirknewton, I would also qualify that by saying I have actually seen a screen shot of quite a few jet radar tracks taking that track as weather avoidance

SIMON – So yes you can probably do that if Kirknewton aren't there, which is most of the time,

[redacted] LAA – can I come back on that question – you need to think in 2 parts to Kirknewton and gliding and summertime and weekends and when they are there but also that Kirknewton flying group can be operating at any time and its VFR, day but not night, generally and that is not predictable.

SIMON – there is a letter of agreement, and we wouldn't break that unless we'd spoken to Kirknewton first.

[redacted] LAA – are you also aware of Latch Farm it's not as active and is just to the west of Kirknewton. And it's a private strip.

SIMON – OK noted., we should be, I'll chat to ANS tomorrow.

BREAK

2nd Half of meeting

Arrivals and Approaches

SIMON – We looked at these and there are 4 options, one of which is the baseline, what we do now, which is holds at STIRA and TALLA followed by some vectoring for an ILS or RNAV approach which we are going to implement, we could have some systemisation and some vectoring which involves holds at approach transitions, and then some vectoring which we will come onto soon, we could have full systemisation which involves holds, transitions and RNAV approaches, and something we looked at is Point Merge, which is used at London City but I'm not sure it's used anywhere else in the UK. We looked at it and thought it's going to take a lot of controlled airspace above the airfield, both North and South and it reduces flexibility, we looked at it with NERL and decided it was a bit of a culture shift at Edinburgh and, needs a lot of controlled airspace and isn't really feasible to take any further, so we

looked at it as an option but decided against it. It also doesn't increase our capacity which is one of our drivers.

Current patterns orange = arrivals

Here's a look at current traffic in our Zone. Again, we have the zone with the 2-mile buffer, You can see the hold at TARTN the dispersal of tracks coming onto final approach for concentration, and similar for R06.
So we are using the airspace virtually to the red dotted line to the west and also for inbounds from the north. One thing we need to do in the future is look at where that red dotted line is, but for R06 inbounds I think we really need to keep it where it is. For R24 inbounds the boundary of controlled air is sufficient, and any less would be very difficult to the east.
That's the pattern at the minute,

Runway 24 (R24) – 2 approaches
Systemisation will look at 2 routes, we have a hold North at STIRA, and south at TARTN, if we are to systemise this with RNAV transitions and RNAV approach, this is kind of what would happen – an aircraft would leave the hold, it would fly the RNAV Transition, which is a line on the chart, using RNAV navigation, coming over the overhead and do what's called a downward leg to join the T-bar south. So RNAV approaches normally have a T-bar here and they would fly in turn left, left again and in. And from TARTN its just fly in join the T-bar and left.
If we wanted the T-bar to the North, traffic in from the North, the Northern point of that T-bar is pretty close to controlled airspace, it wouldn't be feasibly safe as its to close to the boundary. So, it's something that is an option, and we take a look at, as I've said we are looking at all options at the minute. Feedback would be appreciated on this

There's an alternative which I've just shown you, where traffic route to the overhead but it's an option, we came up with a long list of options and so we put it in there as it would be remiss if we didn't.

R24 3 approach routes –
Inbound from TARTN, the vast majority of traffic, approach transition to the T-bar, if you remember we discussed the departure SID out to the EAST which will save an awful lot of fuel and approaches from the EAST and similar for arrivals, routing in over the north sea and straight in for the RNAV and no issues really, and from the STIRA from the North to join the T-bar, and again to the north the controlled airspace isn't big enough for the T-bar so what do we do, we bring it through the overhead and downward left in a systemised way, using RNAV systemisation as opposed to vectoring to follow these paths.

R06 2 approach routes –
From R06 just the 2 approach really, routes from TARTN again when they approach transition or vectoring to join the T-bar, and from STIRA again from the north to join the T-bar, and in the case of this runway we can have the full T-bar if required.

R06 3 approach routes – The one from the EAST is the additional one here so do we go to the south of the airfield to 06 and to join the T-bar from the south, or do we go to the North of the airfield to join the T-bar to the North, and that will depend a lot on how many departures

are going which way. Again, we need to keep both options there, and decide which one is best.

Next slide - Having said that what we are doing is working with NERL, and this is fairly complicated, but I'll explain. It's a schematic way of representing we are looking at a SID to GOSAM, The GOSAM SIDs currently goes almost all the way towards Glasgow. Before turning left to join the network. We are looking at truncating it, so instead of traffic coming of here and routing towards GOSAM way over here, they would get to around this point here before turning towards the network, which is a good saving for track miles,
We have also looked at the TARTN hold, and possibly moving it 5 miles or less in either direction, it would minimally affect traffic below 7000ft. it's something we will need to do in the simulator because NERL are looking at our TALLA tracks coming off R06 coming out this way and down to the southeast and missing the hold, to do that they need more controlled airspace down to the southeast. This would be working with NERL on their airspace change, what we would need to do is just join TALLA departure up to that point.
As previously mentioned, we are looking at GRICE departures and whether we need to cut the corner, whether it's justified with the amount of traffic we have on GRICE. And we are looking at the STIRRA hold becoming just an Edinburgh hold, as opposed to an Edinburgh and Glasgow Hold, and if we could move this a little just to make things a little more efficient. Again, these will be going to the simulator at Prestwick and are just options at the minute. We are looking at more controlled airspace out to the east so that we can route traffic out to the east.

Next slide - I'll just briefly I'll talk a little on holds, the TARTN hold is here, it may move a little we aren't sure, the STIRA is here and may move a little bit, again we aren't sure.
One thing we do need is low level holds – which won't be used often, but when an aircraft comes in and needs to go round because of e.g. a runway blockage rather than route back to TARTN or STIRA, we will have some low level holds for them to keep the delays short, so we may design those in as holds after a missed approach.

As I've said we are putting everything into this engagement so that hopefully at the next stage nothing will be a surprise

And finally, Airspace boundary change EAST departure and / or arrival route – this shows a stepped airway so we can allow aircraft to also arrive from the EAST. Again, the Track miles there and the fuel savings are phenomenal.

Further Design Principles –
I'm going to briefly touch on these further design principles, (FDP) and you may want to ask James questions about Noise, Tranquillity, Air Quality (AQ), note down any questions you want to ask, and I'll run through them

FDP7 – Flight paths should be designed to minimise the total adverse effects on health and quality of life created by aircraft noise and emissions (Health and Wellbeing)
We do that by routing over the least amount of people, we have maps on our system to assist us in doing that, stage 2 is a qualitative statement – so it's what we think we can do, with more analysis in stage 3. And of course, we will encourage CCO/CDO continuous climb, continuous decent operations, at the minute we are already very good at Continuous climb we are at 100%, most of the time.

Air Quality – Current baseline is the metric for all measurements assessed at programme level,
Tranquillity we look at the impact on Quality of life, on new areas overflown.

FDP8 – For flightpaths at or above 4000ft to below 7000ft, the environmental priority should continue to be minimising the impact of aviation noise in a manner consistent with the governments overall policy on aviation noise, unless this would disproportionately CO2 emissions (Health and Wellbeing) – so the example I would use is, if you're going of R06 on a TALLA departure and you're a right over the River Forth, at around 4000ft and by the time you're at 7000ft you're not going to fly over anyone else because your over the water why wouldn't you turn right to TALLA. So that's a pretty straight forward way of explaining that

AQ, we assess that up to 1000ft over the whole programme,
And then Carbon is simply the length of the flight path more or less track miles. We looked at the GOSAM truncation earlier, if we can get that then that's less track miles and helps with this design principle.

FDP9 - flight paths should be deigned to minimise population overflown below 4,000ft and between 4000 and 7000ft taking into account any potential adverse impact, due to those overflown having protected characteristics, as defined by the Equalities Act 2010 (Health and Wellbeing) - so again its looking at minimising people overflown with noise, and then people with these characteristics are assumed to be widely distributed except for obvious clusters - I've listed the protected characteristics at the bottom there and basically, we won't design a flight path with biased to any of these people, this is quite a difficult one really, but if they're e.g. retirement villages, and we know about in Kirknewton then we will try not to or minimise flying over them, as it's there and a design principle we will try to take those into account

FDP10 – flightpaths should be designed to minimise overflying sensitive locations and noise sensitive receptors (for example the zoo, retirement complexes, green spaces, historic heritage sites, and others (Health and Wellbeing) –
We have map with schools, hospitals, sensitive receptors on and looking at local knowledge to help us do this and we are working with our communities, for example a member of our Noise Board advised they are building a new school at Rosyth, try not to overfly that, and then we Dalkeith country parks which if they aren't already overflown we will try not to, and avoid, but it's a matter of weighing up and compromise and then going to public consultation.

And then the contradictory one of course is FDP11 – Flight paths should be designed to include track concentration and/or dispersal options to provide noise respite (Health and Wellbeing) – certainly with a SID your concentrating tracks and with final approach your concentrating tracks, but with Arrivals you can still use vectoring for dispersal and for Timed SIDs we looked at this for Respite possibly operating quieter SIDs at a time of night when you can operate them – We've thought about timed SIDs but its not great from a systems point of view, its whether you can turn on a SID at one time of day and another SID at different time to give respite, I think with the 4 different SIDs and natural dispersal and routes we are kind of achieving that, we are also providing respite through design so taking more traffic along the Firth of Forth and along the M8 corridor as well. So we are looking at every option really and we need to come to an answer and I am sure we will. With concentration of SIDs below 7000ft with the issue of noise would we limit vectoring of SIDs until they pass

7000ft, again this is engagement and you'll be getting a feedback form so please let us know what you think?

FDP12 - Fuel burn – that's a relatively easy one to answer in that the shorter you can make them the better. And use of CCO/CDO, that's what we are trying to do really.

FDP13 –Efficient and effective route management – we are looking at end to end distance here, CCO/CDO and carbon and fuel reduction which are good metrics to use.

FDP15 – Flight paths should be designed to minimise adverse local AQ impacts
To look at this we look at the programme as a whole, we are currently doing a large project looking at AQ around the airport not just from operations but from people getting dropped, taxis traffic on the motorways etc
Local AQ happens below 1000ft, flight paths are unlikely to change significantly below 1000ft but it's a piece of work we will be doing, we look at that in stage 3.

Looking at the next slide - ACP – the approach to AQ assessment - and again this is the hypothetical area we would look at for AQ. So, landing R06, aircraft tend to be below 1000ft, and departing R06 this is where they climb up to1000ft. so it's just in those areas there that are really affected and the opposite for R24.

FDP16 –Maximising capacity in order to contribute to economic benefits to Scotland, including tourism - what we really need to do for this is to try to stay ahead of the game in designing the aircraft that want to come here at the time they want to come here and keep that capacity.

In conclusion –

I've spoken about Capacity, all the departure options, or most of them, the rest will be in the presentation handout, all of the arrival options, restrictions on routes like not flying over Edinburgh, Kirknewton, the effects of not expanding our Controlled Airspace and what that would do to us and the effects of what new controlled airspace would have. And I've mentioned all our design principles and how they are approached in stage 2. Qualitatively – which is you'll have design options like I've shown you schematic so that you know where this is going to go, and then we will write about them ai9n our design principles evaluation and also in Stage 2b, where we will talk more about what we will do for design option appraisal.

Next Steps-
NERL ACP – Just briefly this is next step – we will finish stage 2a / 2b and submit them to the CAA, with NERLs ACP they are looki9ng at simulators later this year, how much systemisation, traffic flows in upper airspace, and Sector Capacity so that if we increase our capacity to 35 instead of 30 that means that NERL are dealing with more aircraft per hour and can they cope. We are looking at the SID connection points and will need to work out accurately where to put those into NERLs simulator, and also inbound - we discussed Point Merge I don't think we get the capacity from that one and we would need a lot more controlled airspace, most of arrivals are form the south, but do get arrivals from North and they won't want to join point merge leading to a hybrid system, it would complicate

things. I think Vectoring and Hold positions for us is the way forward. We looked at holds and that they may slightly move just to make things more efficient.

EDI ACP - Capacity – we've investigated our safe departure intervals and reducing them from 2 minutes to 1 and a half minutes, looking at where we can split our SIDs, close to the airfield or further away to give us capacity. But looking at noise and its affect and where people live, although we'd love an early left turn of 24 but we have Kirknewton, who are not overflown at the moment, they'd be a new area overflown, and Winchburgh likewise for early right turns, so it's something to bear in mind for noise which is a priority below 4000ft
We've defied our route options we've shown you our long list of design options, we will whittle them down and look at how we present them in 2b, we have our capacity study findings, we are looking at our environmental aspects and are just working through the Stage 2 airspace change process, looking at mini swathes so we can do our initial options appraisal in stage 2b
The Qualitative appraisal Stage 2b we will apply design principles to our options.

Final slide – you can see here the email to return your feedback to
I'll be sending you out a feedback form and copy of this presentation in full today, we'd like your feedback by Friday 17th June, I'll send a reminder of that as well.

If you have any questions, please ask?

[redacted] from Cumbernauld Airfield?

[redacted] (CUMBERNAULD AIRFIELD) – Thanks you Simon, very interesting and concise – one piece of information for you and then a question

I note from NATMAX that the CAA's controlled airspace control policy has now been renamed 'The policy for the design of controlled airspace structures' and that's going to be rolled out in the next quarter, so the buffer zones if I can use a non-technical term for the edges of airspace, is certainly part of that review so I am just letting you know there's new terminology there that may help.
My question relates to your systemisation of approaches, I take it that you are going to extend the RNAV Transitions into final approaches, is that as I understand?

SIMON – Yes, I'll go back to ANS, but they want systemisation, but we also want vectorisation as well, so we want to have our cake and eat it, vectoring gives us flexibility and capacity, systemisation gives us procedures to use during quiet periods of the day and also during radar failure or something like that, so we can get our aircraft in using hold RNAV Transitions and RNAV Approaches. So, there will be a mix of what happens, and they'll probably use systemisation during quieter periods, or for belts and braces if there's a radar issue, vectoring gives dispersal flexibility and capacity.

[redacted] (CUMBERNAULD AIRFIELD) –so the final approach to minimis and the current RNAV RMP is limited to LNAV and LNAV V NAV so you'd have a hit there on reliability or would you be looking for a hybrid approach which would start of as RNAV but finish with ILS?

SIMON – well we'd still have our ILS , radar vectors to ILS, and we'd use RNAV rather than the NDB at the moment, I understand where you're coming from in that it's difficult to get RNAV vectors for an RNAV approach so you would have systemisation to the RNAV if the ILS had failed for whatever reason, that may answer your question, whether we go for RNAV to ILS is another question, I'm not sure if it actually exists in this country or not. Or if that's something to pass to the CAA and ask the question of them. Today was about options and no matter what option we go with they will be flying a straight line on final, it's a good question and a conation we would have to have with the CAA the airlines and ANS here to see what is the best solution.

[redacted] (CUMBERNAULD AIRFIELD) – that's fine you've clarified your thinking I now understand thanks

SIMON – [redacted] another question?

[redacted] (LAA)- yes Not criticism of any air traffic controller but vectoring during busy time and systemisation during quiet periods, removing the human, should be more efficient than the human, also removing the vectoring also complies with a lot more reduced track miles etc.
Looking at the efficiency of the machine, removing the human, the humans we gather are complaining, and they cost,

SIMON – well we will see what the best option is, this is one of the options, and this was looking at t them all and taking them through, I understand what you're saying about systemisation, there's the dangerous skills fade but then there's training you can do to keep your skills so, again it's a question for the airlines airport etc going forward, when we go onto stage 3 and our concepts. It's something from these engagement sessions that I will take back, and we will discuss. At some point down the line, we will need to take these decisions but for now it's something we take all these options through, so we don't miss anything out. Thanks [redacted]

Any more Questions. [redacted] ?

[redacted] (NATS) – you mentioned investigating the 1 and half minute SID options, have you had any further dialogue with the CAA on that separation standard and how are you looking to progress that safety argument?

SIMON – we introduced the idea to the CAA earlier this year and we will go back to them once we have some concrete data and we've written that up, so that's where we are with it at the minute.

[redacted] (NATS) – and does the option of the various SID options does it negate that one and half minutes or does it still help you. Effectively you've got the ability to turn left right straight ahead does that give you your splits required.

SIMON – it still helps

[redacted] (NATS) – with the same direction basically or similar direction

SIMON – Yes, so most of our traffic we think will go GOSAM so it will still help with the GOSAM departures so minute and a half, minute, and a half GOSAM following GOSAM Again, it's part of various workstreams and something to work on throughout the year really

[redacted] (NATS) – So when will the CAA come back to you on that.

SIMON – We need to go back to them and present again, so we presented this to them earlier in the year and we will need to go back to them once we have the data to tell them we can do it, it's a way of us increasing capacity and hopefully you'll be on board with it.

[redacted] (NATS)– It has an impact if you do it and it may well set a precedent, and everyone else may want to do it as well.

SIMON – i think with the data from the aerial we have out its doable – Jeroen you may want to say something

[redacted] (To70) – Hi Chris I understand you missed the first part of the presentation where Simo n described the options from the SIDs and capacity so we identified 2 methods to increase the capacity, the first decreasing the time in the interval table, we see there is a safe solutions, we did not do a full analysis at this stage but with the data we have we see that you still can have sufficient separation between aircraft so that will provide some additional capacity and what Simon also showed is that there were ways to introduce new SIDs. Early splits in this optioneering phase, and if you are able to introduce an early split you will have an additional departure capacity. So, we see 2 methods and you can do either one of them or both to increase the capacity.
What is also important to you is that we show 2 figures in all the slides, and that shows figures if it is possible but that is part of discussions with you and the airport I think
To reduce the separation in Scottish airspace you will have another additional capacity. So, there are maybe 3 methods to include to include capacity.

[redacted] (NATS)– Ok thanks

SIMON – Are there any more questions

Ok

So we have showed you all the options, our design principles and we will get the presentation to you with a feedback form, anything you'd like to say you can put on that and please do, we will answer it, and also any questions please send them to the airspace change email. I do give regular updates to EANAB, the Consultative Committee, FLOPSC meetings and various other people on a regular basis. If you have any questions, please do get in tough that's what this is all about and taking you on this journey with us
Thanks for giving up a couple of hours of your afternoon its very much appreciated.
Once we've got our final designs, we can look at our controlled airspace and if we can give any back, the answer to that is that we probably can
Thanks again. There's another of these sessions at the Hilton Hotel, next Thursday at 2pm, so if you want to see more of this, it is the same though, please come along.,

We will be in touch please send us some feedback it's really appreciated.
End of session – Duration 1:51:00

Attendees:

Name	**Company/Representing**
Simon Rhodes	EDI
[redacted]	SRUC
[redacted]	NATS
[redacted]	To70
[redacted]	Attending on behalf of Cumbernauld Airport
[redacted]	MOD
[redacted]	GATCO
[redacted]	GASCO
[redacted]	ARPAS
[redacted]	SRUC Oatridge campus
[redacted]	Scottish hanggliding and paragliding
[redacted]	EACC
[redacted]	NATS
[redacted]	LAA

Engagement session 2

9th June

Edinburgh Airport ACP Stage 2 Engagement Session-20220609

Transcript of meeting

Due to a technical error the first part of this session was not recorded however the presentation in Annex B was presented as in the previous 2 sessions using this presentation. The content included capacity and departure options as detailed in the presentation.

Arrivals and Approaches options. I'll talk about additional CAS we might require and some more about environmental design principles.
Our four options are holds to radar vectoring, some vectoring and some systemisation, full systemisation with approach transitions, and point merge which is becoming unlikely as this would require a large volume of CAS above the airport with complicated procedures to get to final approach with more track miles.

The current pattern shows the aircraft quite well dispersed as they approach Rwy24 or alternatively Rwy06. And final approach will remain fixed where it is.
We will look at rwy24 with 2 approach routes and systemisation. From the TARTN hold we would take aircraft from the hold on an approach transition where they would fly an RNAV approach or an ILS. This line would be designed as an RNAV flightpath and would use the FMC. This reduces the pilots and controller's workload. From the STIRA hold they would fly to the overhead to join the pattern as one possibility, or they could route to the north of the airfield. There is an issue here in that we do not have enough CAS to design this option, and this would need to be justified realising the proximity of the GA airfields to the north.
With 3 approach routes we would have arrivals also routing from the East and joining virtually straight in. Again, the routes from TARTN and STIRA would be part of the solution. This would need to be analysed to give a working option. We would again look at whether arrivals from STIRA would route via the overhead or to the north of the airfield with the issues previously mentioned for a northern T-bar.
On Rwyn06 the two-approach route would come from STIRA and TARTN to the T-bar. Inbounds from the east would need to cut across the TALLA SID or route to the north and avoid some departures. There is not an ideal solution here so we would need to look at the best option.

We are also working with NERL and Glasgow to make our airspace more efficient. The GOSAM departure currently ends over towards Glasgow. We are trying to truncate this SID and turn aircraft south, earlier so this would improve efficiency by shortening track miles, it is preferable for the network and also reduces complexity and interaction with Glasgow.
We spoke about GRICE departures and how they would miss the STIRA hold, also the STIRA hold would become exclusively Edinburgh's as at the moment it is used for traffic from both Edinburgh and Glasgow. Also, if we did develop and EAST Sid this would need additional CAS to allow for its climb out from Edinburgh. Finally, we might move the TARTN hold to facilitate a TALLA SID moving east and allow more efficient use of airspace for our departures to the southeast.

Finally I'll show some low level holds which would only be used sparingly in case the runway is blocked for instance with a vehicle with a burst tyre. This would allow aircraft to remain close to the airfield for landing instead of routing back up to the holds at STIRA and TARTN. On this slide we can see the possibility of arrivals and departures to and from the east which would require additional controlled airspace.
Now I'm going to talk more about further design principles
We reduce the effects of the adverse effect on health and quality of life by overlying minimum amounts of people in. Air quality is assessed at program level below 1000 feet and to reduce carbon we reduce track miles.
The next design principle is similar but is differentiated by a height band so we can reduce track miles by turning aircraft on flightpaths between 4000 and 7000 ft if the aircraft is overflying areas with no population such as the Firth of Forth. We have previously mentioned air quality and reducing carbon. We may also look at the way aircraft depart which is not in the scope of the ACP and is something we would like to do.

FDP9 again is similar to the previous 2 DP's and people with protected characteristics are assumed to be widely distributed in the population unless they are in a retirement complex or a home for blind people as an example. The protected characteristics are listed on the slide, and we shall try to bear this in mind as we design the flight paths. Generally, this is achieved with overflying the minimum number of people.

In FDP 10 we will use detailed maps to minimise overflying sensitive locations and noise-sensitive receptors as well as local knowledge from engagement with community representatives. As we move through the process, we can look at this is greater detail.

FDP 11 looks at track concentration and track dispersal. SIDs will be concentrated, and respite is timed. This can be achieved by using certain SIDs at night and we can also design respite by ensuring a SID overflies the least amount of people. Vectoring arrivals leads to dispersal, but systemisation would concentrate arrivals and might be a tool that we use.

Flight paths are designed to minimise track miles so shortening track distance will save fuel and emissions as well as operating the aircraft for Continuous Climb Operations and Continuous Descent Operations. Something that we already do well.
Efficient route management an example of which is truncating the GOSAM SID and there for allowing for less fuel to be carried and ensuring efficient route management.
Air quality is measured below 1000ft and is affected by delays on the ground. This slide shows the areas in which air quality could be measured and depicts where aircraft operate below 1000ft.
Our final design principle for this afternoon is about increasing economic benefits to Scotland by increasing capacity, allowing for more aircraft movements and allowing for more aircraft to operate in and out of Edinburgh Airport.

I have just been through the design principles. We have looked a t all departure and arrival options. Capacity and restrictions on route. Airspace restrictions and the possibility on new controlled airspace. We look at these options in Stage 2B qualitatively and writing about them as opposed to numerical analysis which is what the process is.

I'll hand over to WSP [redacted]

The Design Principal Evaluation and Initial Options Appraisal in Stage 2B will be qualitative. It's not really possible to do detailed metrics on a large number of options.

DP 7 we would try to minimise population overflown. There is an option to minimise health options by increasing annoyance to a broader population and this is quite an interesting metric. Comparing noise to health effects.
The guidance in CAP1616 notes that there are parameters for annoyance and noise, and we will use a tool called Webtag to analyse these.

DP8 minimising the impact of aviation noise against CO2 emissions, and we would be looking at that up to 7000 ft. Minimising health impact is more important than reducing carbon up to 7000ft. We will be looking for opportunities to do this.
The equalities issue we shall look at with people with protected characteristics being dispersed among the community. If you have any particular sensitive areas that you know about we can look at those and we will be using up to date maps.

The air quality issue comes into play when aircraft are below 1000ft. Typically aircraft will not be turning below 1000ft and we will look at this at the programme level.
We should be able to provide metrics for fuel burn in Stage 2B. You would welcome any points on sensitive receptors would it be possible to show us a map. We need to be aware of care homes, planned residential areas etc and approved developments. We look ahead as far as we can for planning as well.

2 more slides from me. NERL have an airspace change at the moment. They are looking at making the network more efficient and they will look at sector capacity and the SID to the East. We think we are truncating GOSAM and need to know where this is hence the schematic diagrams.
Inbound we have looked at point merge and also vectoring and systemisation. We have done work on capacity so its investigating safe intervals and also the split point on the SID and the optimum pint. The capacity we need comes from the 10-year plan.
The next stage is to look at where these routes might go and do the qualitative analysis before the quantitative analysis in Stage 3.
We will look at the 10-year plan, environmental aspects and this is quite a complicated project with 16 design principles. The project is ongoing, and we can't apply all of the design principles at this stage.

The presentation and feedback form will be sent to attendees, and I'll open up to questions.

[redacted] (EANAB),
On arrivals would the consideration of the steeper ascent be part of this. 3 to 3.2 may offer significant noise.

This is not part of this project, and the ILS is 3 degrees and the RNAV approach would be similar and this would be expensive to do. This would have a big effect on aircraft close into the airport.

[redacted] (EANAB)
When discussing DP7 you mentioned broader population to reduce annoyance and the suggestion of not having the flights too concentrated is the way to go.

The CAP1616 does note that on some occasions this may be an option to have more annoyance to more people. This is not a general principle but is just and option. We would look to minimise the number of people overflown.

Does respite include night-time flights?

This would be timed and is in there as a design principle and we would consider this. At certain times of the night, we would use the quietest SID and is an idea. Our sustainability strategy is to be a trusted neighbour.

The quality of life is usually questionnaires. When will this go to the public?

There will be no questionnaire and we will be looking at this mapping including tranquillity and minimising the effects on people. This would be mostly noise and tranquillity.
We would need to understand the feedback on quality of life would look at annoyance levels and health impacts. How is this assessed and understood?

WebTag has metrics for various outcomes based on noise contours and will take place in Stage 3. This would be a quantitative assessment on health outcomes. We would look at where the flightpaths go and height bands also.
Stage 2B is qualitative and Stage 3 quantitative.

[redacted] (EANAB),
WebTag is a series of mathematical models and monetises them and based on the noise contours looks at the before and after impact and shows a cost benefit or disbenefit. There is a debate on the levels that we will take this down to. Could someone from WSP confirm this?

[redacted] (EANAB)
In the earlier presentations there was a distribution of traffic through the different SIDs and there is an East possibility. Are you able to update that map with an estimation of traffic to the east.

Not yet but we need to do this work and look at the estimates for this route.

I can see no more hands. The departure options were longwinded, but we needed to do this. We will continue with further engagement as we move through the process. You have an email address and phone number etc, but we shall keep you informed as we progress.

Thanks all.

Atendees:

Name	Company/Representing
Simon Rhodes	EDI
[redacted]	Trax Glasgow ACP
[redacted]	NATS
[redacted]	ANS
[redacted]	ANS
[redacted]	WSP
[redacted]	AIRSPACESO
[redacted]	ME
[redacted]	EANAB
[redacted]	EANAB
[redacted]	EANAB
[redacted]	EANAB
[redacted]	EANAB
[redacted]	JOHN HOWISON
[redacted]	EANAB
[redacted]	NATS
[redacted]	EANAB

Feedback and comments from the sessions

Further engagement

GA Engagement

GA and other airspace users Engagement

Edinburgh has engaged with the GA community both before the Covid pandemic, through joint engagement with Glasgow airport on the 9th September 2021 with the opportunity to present to the GA community, and also through the Edinburgh Airport engagement sessions run earlier in 2022. We will continue to engage with the LAA, Scottish Gliders and Fife Airport as we progress through our airspace change in the coming months and look forward to these meetings.

Please see the meeting notes below from the 16th March 2020, the presentation given to the joint engagement session on the 9th September 2021 (At Annex D) and also some feedback from the engagement sessions earlier this year including some joint engagement with NERL.

Notes from a meeting with 2 representatives from the gliding community in Scotland and the LAA

16/03/2020

The GA community said they were not engaged with during Stage 1 and wanted to work constructively with EAL. I confirmed that this would be the case going forwards and said a clean sheet approach was necessary to get the best result for all aircraft.

EAL have adopted a clean sheet approach, looked at possible options and taken this forward. The fundamental way of looking at phase two and the options therein needs to be documented. A ranking of design principles might be appropriate here. Look at the evidence and see what is required as this is necessary in the CAP 1616 process.

They wanted to input their data from IFR movements annually. This showed a slight decline. Passenger numbers increase but the decline would be to aircraft movements. Is their data verifiable? Can we choose what data? CAP1616 data. Ours is based on capacity so what do we want ours to say?

How do we verify the data they are using? What do we need to do to discredit them? I wonder what we need to do with regard to looking at how to placate them. Will we have to look at another way of looking to the airspace if required. [redacted] ANS do not have this airspace. It is ours and as such we need to utilise it as much as we can. Look at options to the North and West and see if they fit with capacity. This all needs to be explained with rationale.

The Presentation from 9th September 2021 is at Annex D.

Feedback from the engagement sessions run earlier in February and May 2022.

1 Attitude and Clarity
The manner, openness, and clarity of your presentation was excellent, allowing us to focus on what might be missing or where the emphasis could be improved rather than needing time and effort to understand what has been done so far. Appreciated.

2 Overall Emphasis
The presentation gave us the impression that your overriding concern was airport capacity, potentially to the detriment of environmental and airspace modernisation. While other parameters were mentioned only capacity was given quantitative assessment. We look forward to quantification of the other factors which are otherwise at risk of receiving insufficient emphasis.

3 Our Concerns
3.1 Modernisation of airspace management and exploiting modern aircraft fleet performance in the environmentally optimum way (continuous climbs and descents) should allow significant reductions in CAS - unless the design rules have failed to keep up and we are seeing CAS being created for volumes where CAT does not need to fly (see 3.4 below).

3.2 Our expectation is therefore that significant CAS reduction should be a strategic objective rather than just a by-product after all else has been considered.
However the impression we gained from the presentation was that CAS reduction "might be possible after we've looked at the detail" and worse still there was talk of new CAS even if "it would take some justifying".

3.3 The suggestion of new CAS , especially to the North, is a major and fundamental concern for GA and seems to us to be a significant step in the wrong direction.
Gliding activity at The Scottish Gliding Centre (Portmoak) would be seriously threatened by any move of TMA CAS towards the site.

3.4 We are happy to lend our weight to arguments with the regulator and Government about buffer policy etc if that is driving inappropriate CAS. If, on the other hand, we are considering operating CAT at lower levels than today leading to the wish to increase CAS footprint we believe that something has gone very badly wrong.

4 Creative pushing of constraints and systems.
4.1 We were pleased to see that the reduction of departure intervals and spacing could achieve significant increases in capacity. We would particularly like to see the potential benefits of full systemisation rather than vectoring individual arrivals.

4.2 We hope that similar creative thinking can also enable benefits in the other as yet unquantified benefits such as emissions and CAS reduction.

5 Coordination with NERL and Glasgow

We believe that the optimum airspace solution for the limited geography of the Central Belt can only be arrived at by close integration of the projects, otherwise eg the strategically important CAS free corridor between EDI and GLA cannot be maximised. We have some concerns that different stages of ACP under CAP1616 imply otherwise?

Please do not hesitate to contact us if any of the above is unclear. We remain of the opinion that the best mutually acceptable solutions can be arrived by collaborative discussion.
Best regards
John Williams (on behalf of BGA and Portmoak).

Feedback from the LAA

Please find below thoughts following on from the above presentation in May 22.

We appreciated the presentation and the ongoing opportunity to contribute to the process.

The focus on capacity is understandable and it's clear that a lot of quantitative work has been undertaken in order to maximise efficient use of the airspace. Whilst it was stated that the process will move to similar quantitative study of the other DPs it does seem to be an omission, as I mentioned, not to have at least carried out some outline work in this direction. It runs the risk of abortive work in some areas of a showstopper appears.

We have some concerns with regard to the stated clean sheet approach highlighted again by the use, and manouver, of the existing airspace, in the presentation. If, as may be the case, it is no more than a backdrop our concern is unfounded. But as we have pointed out, at both Glasgow and Edinburgh, the current allocated airspace is out of proportion for the current airports need in our view. The additional north east route is and understandable option ad reduction in track miles.

Others have raised the issue of outdated design requirements – containment buffers – and this is something that we feel needs to be resolved at a higher level in order that your (and others) design be developed to take full advantage of current navigation facilities in addition to modern aircraft performance. That is not as yet visible in the process.

We are aware of the cooperation between Glasgow, Edinburgh and Nats – NERL and support the logical need. But are wondering at what point, and in what manner, that co-operation and meeting of the design elements will ocurr. As the three elements are submitting individually and without cross reference it would appear to still be stand alone designs ?

It will of course be of much interest to see the quantitative output regarding the other DPs.

Edinburgh Airport comment:

Edinburgh Airport appreciates the ongoing dialogue between the LAA, Scottish Gliding Association and ourselves. We are updating our capacity requirements and looking to implement reduce time intervals between departures. This means that we can achieve our capacity goals with 3 or 4 SIDs which is an efficient use of airspace when considering even more departure options. We are looking to implement a route to the East and the associated fuel savings en-route which is why us and NERL are looking for controlled airspace out to the east of Edinburgh. We would like to have further controlled airspace in order to Straighten the GRICE SID and also to establish systemisation to the north of the airport for arrivals to Rwy24. This is something that we would need to justify if the projected aircraft movements allow. Again further analysis and engagement is needed here but

these are just options. We also appreciate that our CAS was designed with the cross runway in mind and now that this runway is closed there may be an opportunity to reduce the volume of CAS around Edinburgh airport. This is something that we need to look at once we have some more detailed designs of flightpaths and we will engage further on this at the appropriate time.

Feedback on the joint engagement between NERL, Edinburgh, The BGA and LAA Common to the Edinburgh ACP and this exercise :-

"It's appropriate to question the predicted capacity requirements / runway handling capacities that in turn are the basis of both designs and no doubt based upon pre-pandemic behaviour. The figures prior to the pandemic showed very little if any growth in movements particularly when focussed to air transport and removal of GA / VFR etc. Growth in passenger numbers no doubt coming from larger aircraft? Many other factors, including Scottish Government policies and behaviours forced upon business in the past two years, will all impact upon those figures so that a sensitivity analysis should be published I suggest."

Edinburgh Airport comment:

Edinburgh Airport appreciates the ongoing dialogue between the LAA, Scottish Gliding Association and ourselves. We are updating our capacity requirements and looking to implement reduce time intervals between departures. This means that we can achieve our capacity goals with 3 or 4 SIDs which is an efficient use of airspace when considering even more departure options. We are looking to implement a route to the East and the associated fuel savings en-route which is why us and NERL are looking for controlled airspace out to the east of Edinburgh. We would like to have further controlled airspace in order to Straighten the GRICE SID and also to establish systemisation to the north of the airport for arrivals to Rwy24. This is something that we would need to justify if the projected aircraft movements allow. Again, further analysis and engagement is needed here but these are just options. We also appreciate that our CAS was designed with the cross runway in mind and now that this runway is closed there may be an opportunity to reduce the volume of CAS around Edinburgh airport. This is something that we need to look at once we have some more detailed designs of flightpaths and we will engage further on this at the appropriate time.

FLOPSC Engagement

The Flight Operations and Safety Committee meetings take place every two months and throughout late 2021 and 2022 an ACP has been a standing agenda item. All base pilots are invited to attend, and the forum discusses runway safety, operational maintenance, aircraft noise, any incidents and operational issues that attendees wish to bring to the forum.

The Airspace Change project regularly engages with airlines through this forum and has also invited base pilots to internal workshops. The issues that the airlines feedback are a wish for increased systemisation and predictable flightpaths to allow for possible fuel savings through more efficient flight planning. They look forward to RNAV implementation throughout the ScTMA and also the possibility of RNAV transitions on arrival. The current statistics for Continuous Climb operations are virtually 100% which are to be expected as there are no flight paths from other airports that route over and above Edinburgh below 10000 feet. Continuous Descent Approaches are currently facilitated and airline stats on these vary but most are excellent.

The main issue for airlines with RNAV implementation would be an increase in track miles and we continue to work with NERL to perhaps truncate the GOSAM SID and introduce an Easterly SID along the Firth of Forth. Both of these ideas are positively received by the airlines, and they encourage the airspace change project to move swiftly and safely to implementation.

During the meeting of March 14th, 2022, the presentation at Annex C was given by the HoA and well received by the airlines with positive and encouraging feedback. The FLOPSC continues to be updated with the progress of this project and we look forward to progressing our ideas through flight simulation and expert advice.

EANAB Subgroup Engagement

The EANAB Subgroup of Aviation, Airspace and Noise is as the title suggests a group of community representatives taken from EANAB and they meet on a regular basis. They make constructive suggestions about noise, airlines and airspace change and EAL have engaged with them throughout Stage 2 of the ACP. The following are notes taken from the regular meetings to give an idea of the subjects of engagement and the EAL response to this. In the latter part of 2021 EAL were constrained by cost and other resource but we are now on a footing move forward with some of these ideas and will continue to engage as we continue through the airspace change process.

12th August 2021

EAL ACP re-submitted at the start July 2021 and was approved by the CAA in July, subject to the following observations on Design Principles (DPs):

Need to study impact on house prices at CAP1616 stages 3 and 7
Need to clarify and address DP 9 on Protected Characteristics
Need to clarify and address DP10 on overflying sensitive locations such as schools
Need to clarify and address DP 11 on respite

The ACP Stage 2 timetable was queried by a group member.

The Head of Airspace (HoA) responded:

Stage 2A we hope to complete by the end of the year. This will involve engagement with stakeholders to see if we have applied our design principles correctly to the flight path options. Stage 2B will take place early next year with a view to completion of documentation for the submission with the July gateway in 2022 already booked with the CAA. Stage 3 (public consultation) will then commence immediately. This full public consultation will take place late in 2022 or early in 2023 but not concurrently with the NAP consultation.

24th September 2021

Progress on EAL ACP.HoA reported as follows:

Currently working with NERL looking at expanding EDI airspace, including the possibility of flying down the Forth.
Will be holding 2 more simulator sessions on arrivals and departures options. Glasgow Airport will be included.
Also engaging with General Aviation (gliding schools etc).
Working with To70 and WSP (environmental consultants) on the planning of ACP Stage 2. Stage 2 is due to complete by July 2022. Will also check if the ERCD information produced in (2018? HoA please confirm year) is still valid. This information is still valid with some caveats from the CAA which are very detailed and will probably require further clarification, however the work already done can be used but may need to be enhanced.
Will look at how EAL can best engage with EANAB during the ACP process.
(Post meeting note: The Subgroup notes that EANAB's ACP and Aviation Sub-

Groups have given a lot of thought to that, which they would like to agree with EAL).
Rather than ask EANAB to comment on all the possible optional flight paths, EAL will request EANAB feedback on swathes. The subgroup advised the HoA to look at a similar exercise for turning swathes carried out by EAL in their ACP a couple of years ago, as lessons could be learned from that. The HoA will circulate their initial swathes in time for the EAL/A SG meeting on 21 October.

Discussion

The subgroup noted that in relation to the flight profiles project started 2 years ago, To70 have now published a study (Departure Noise Optimisation 19.265.01) for Heathrow Airport. It shows the potential to reduce noise for communities around the airport by up to 300%. Consideration of that modelling needs to be incorporated in EAL's ACP workings. The HoA will discuss this with To70. The subgroup also observed that the key point is that this would lead to different entry points. This would not be the case as different aircraft have different climb rates dependant on weight, weather, engine performance, operating procedure etc. The effect of this is that aircraft reach 7000 feet at different points along the SID. This does not mean that there are numerous different entry points as the SID always terminates at the same place. What this does mean is that aircraft are turned at different places along the SID once they have reached 7000 feet.

Using Dalgety Bay as an example, EDI hand over flights at 6000ft and asked who is responsible for noise between 6000ft and 7000ft? HoA advised that the responsibility for noise remains with EAL up to 7000 feet. However, the aircraft may be speaking to Edinburgh tower, Edinburgh Approach or NERL (NATS-Prestwick) at this point. EAL need to ensure that the rules are observed and applied correctly.

The subgroup also noted that we need to capture the implications of flight path dispersal vs concentration. HoA considered SIDS could possibly vary over time. SIDs can be enforced to be used at particular times of the day.

There were 3 questions concerning the Design Principles:

Noise sensitive sites. HoA will circulate a Google Earth compatible population map showing the sites by 7 October. ACP SG will then feedback comments on the comprehensiveness of the list and to request clarifications on nature of the sites.

Carbon. Between 4000ft – 7000ft the priority is noise over carbon unless there are special circumstances. HoA will seek clarification of these circumstances from ACOG.

21st October 2021

The subgroup queried how much use Glasgow Airport flights would make of the route down the Forth. HoA responded they would use it. They would use the Forth option subject to it becoming available, but all of their aircraft would be well above 7000 feet. NERL have work to do on this, but I shall endeavor to find an answer.
HoA advised he had received an email from the MoD on the North Sea Training Area trial. He will forward it to the sub-group.

16th December 2021

ACP Stage 2 (Options development) and Stage 2a (Initial testing with stakeholders of options-outlines)

Simon presented the above-noted PowerPoint slides and requested the ASG's comments on them. Copies of the slides will be sent to Merv to circulate to the sub-group. The slides are to be treated as confidential for the time being and not to be circulated out with the ASG.
The sub-group's initial comments were positive.

14th February 2022

How do EAL intend to balance and evidence noise against emissions between 4000 – 7000ft? This affects arrivals as well. HoA will look at Gatwick work to see if it applies to EDI. This is to be part of Stages 2 and/or 3. We would need to look at where the flight paths go, analyze and make a judgement. If there is minimal effect on population overflown then the solution presents itself but if this happens, let's say when an aircraft is at 5000 feet or above then this would make the turn later. The solution will be different for each flightpath on analysis.
What is the additional emissions and noise cost for steeper climb rates below 4000ft? This will be part of the ACP noise studies. Emissions need to be addressed by EAL, as required under CAP1616. Simon had offered to send a spread sheet with more information. This is to be part of Stage 2 and advised this is work in progress. Noise is the main environmental issue below 4000 feet. The analysis for stage 2 is qualitative, i.e., written but for Stage 3 will be numerical and we can actually add values to climb rates and emissions. This should be something we will look at early in Stage 3 after Stage 2 feedback.

HoA outlined the next stages of EAL's ACP programme:

Currently at stage 2A. Departure and Arrivals concepts established and EAL are looking at all options, including retaining existing flight paths. NERL have their access points so existing SIDs are the starting point.
Invitations to participate in a briefing have been sent to stakeholders, focus groups, EACC and others. The subgroup noted that they had not received an invite. HoA will ensure all ACP/A SG members are invited.
End March/April, EAL will present swathes options.
July, submit stages 2A (have stakeholders been properly engaged with on all options?) and stage 2B (initial options based on feedback from stage 2A).
Stage 3 gateway January 2023 – submission beginning of the month and approval, hopefully at the end of the month. This is an expensive stage that includes full appraisal of options and the consultation strategy.

Other points, just my continued thanks to the group for your actions, questions and support. I am now looking through all of any outstanding actions both in the subgroup and EANAB as we are beginning to work at a more normal rate. Actions will be distributed to the relevant people. Also, there will be more engagement in early April, and I shall send the dates

through ASAP. This will cover how we apply our Design Principles to our options.

21st March 2022

Progress update on EAL's ACP CAP1616 Stage 2 activities

HoA is meeting To70 to look at options to refine each swathe down to 3 or 4 flight paths, which will include the existing flight paths.
They will then be compared against the 16 Design Principles.
There will be 1 or possibly 2 further meetings in April/early May with the Key Stakeholders to complete Stage 2A engagement.
Stage 2B – initial options appraisal then follows. It is a qualitative (i.e., words) assessment as opposed to a quantitative exercise looking at noise levels etc. It will be submitted to the CAA but not to Stakeholders.
EAL will meet with Prestwick and then ANS, 2 pilots and others in 2 weeks to discuss their ideas.
EAL's existing ACP presentation will be developed including the way the Design Principles have been considered.
See CAP1616 Appendix C for the required format for this stage.
Andrew asked it the Arrivals and Approaches presentation could be shared with Community Councils. HoA noted they could not, but they will eventually appear on the CAA portal.

20th May 2022

Prestwick and EAL are keen on using the Forth estuary and realigning GOSAM to the M8 corridor. Louise had asked, what about flights for runway 24? Simon noted numerous options are being examined, however the left turn conflicted with incoming flights from the south. An early right turn about 4 – 5 miles west that would look to avoid overflying Fife coastal settlements might be a solution.

The subgroup again asked that 10,000ft be used as the upper threshold for which noise is considered relevant, as the current 7,000ft limit meant that significant noise disturbance was experienced by overflown communities.
In support of this Dalgety Bay have their own noise monitor and offered to share data from 2 Ryanair flights overflying at substantially different heights.
It had been observed that flights at 7,000ft – 10,000ft over quiet areas created significant noise disturbance, as noted in the complaint's reports –
On respite the following points were discussed:
Could night flights could be scheduled to provide some respite? HoA responded that noise may be able to be limited between 11pm and 7am by having only 2 SIDS over that period to provide respite.
Data will be provided on flights over Dalgety Bay after 8pm, when it is still quite busy, so some respite would be appreciated.

Progress update on EAL's ACP CAP1616 Stage 2 activities
EAL are looking at options:

Approach options – early, medium and late turns for the 4 SIDS.
Point Merge is no longer an option.

Looking at holds at TARTAN to the south, STIRRA to the north and a new hold to the east. This is a NERL issue.
No fly zones are being identified – for example Edinburgh city centre, due to the high population density.
EAL see a growth in long haul flights with the need for capacity throughout the day rather than a peak at the start of the day.
Design Principles (DPs) are being considered – noise, health, respite, air quality, noise sensitive areas, increasing tourism in Scotland, along with Key Stakeholder comments. The DPs influence on the options are being examined.
Stage 2 involves writing about things, whereas stage 3, which should start in August, is when the detailed analysis will be done.
Looking at spring 2025 for the final implementation of the ACP.

8th July 2022

HoA noted To70's analysis of flight profiles as a potential means of noise mediation would be part of the ACP stage 3 works but hopes that he can bring it forward to stage 2. Within the next 1 – 2 weeks HoA to confirm if this can be done. If it can, an early AAN SG meeting with HoA is to be set up to establish the brief for To70's work.

Progress update on EAL's ACP CAP1616 Stage 2 activities

HoA provided a 7-slide presentation of possible ACP proposals. As they are preliminary at this stage and subject to further development, they cannot yet be shared with either the AAN SG or the Board.

HoA noted capacity could be increased by reducing departure intervals.

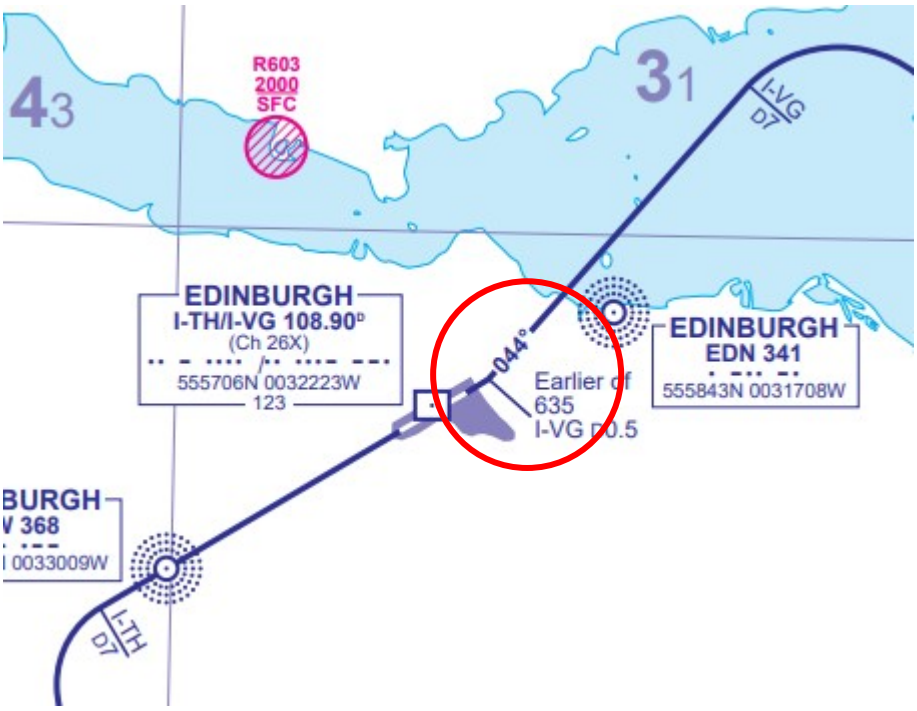
He is hopeful that EAL will be able to acquire 3D software to examine inbound and outbound tracks, comparing them with areas of population and sensitive areas.

EAL Comments

The HoA would like to put on record his appreciation of the efforts made by the EANAB SG throughout the year. Their engagement has been positive and is much appreciated. EAL have kept engagement going with the Subgroup and board throughout the year with representation at all board meetings and subgroup meetings. This is an excellent way to keep communities informed of progress on the ACP

Cramond Engagement 2nd March and 24th June

The Cramond group are residents who have an interest in noise and noise mitigation having visited the airport in the past and are keen on our progress with this ACP. Cramond is the most affected residential area being within 2 miles of the Rwy 24 threshold and affected by all aircraft movements. Fundamentally arrivals on Rwy 24 and departures on Rwy 06. Aircraft arriving on Rwy 24 will overfly Cramond and mitigating for noise on this flightpath is difficult as commercial aircraft fly a straight-line stable approach. Departures are currently able to turn away from Cramond as seen in the diagram below and it is hoped that we can improve this situation as part of the ACP.



The turn onto 044 degrees depicted in the circle on the diagram above illustrates the turn from Rwy 06 affording a 15 degree turn from the accurate runway heading of 059 degrees.

A meeting in person took place on the 2nd March. The conversation included any improvement we could make to turn the departure profile away from Cramond and the amount of turn this could be. A figure was mentioned for an increase in the turn but it was explained that when developing an RNAV SID this turn would not be a figure although one could be approximated. A solution was put forward along with different options in the Cramond presentation at Annex A.

A further meeting took place in person on the 24th June to explain the RNAV solutions that we had come up with and the flight path distributions. This is illustrated in the slides below. We continue to have dialogue with the Cramond residents as the community is affected by aircraft noise from both arrivals and departures.

1 Eastbound departures - your slide showing the proposed banking between the blue lines, gives us some comfort - it is what we have been requesting for years. (Though it would be good if it could be enhanced further). Some points -

a) We are concerned at the "exception" for slow moving planes, which is a real encroachment over Cramond. Can you please clarify. This would be a rarity, but what aircraft is involved, how many can be expected on a daily/weekly basis, and what proportion of total flights does this represent?

b) The present proposal sees banking commence at 600'. The internationally accepted height is 500', and this would obviously improve the banking away from Cramond, if used. You explained CAA do

not accept 500', but please confirm that you will request and lobby for this. If CAA agree to 500'. will you adapt the path to accommodate that improvement?

c) Timescales - We were concerned that implementation will not take place till summer 25! We understand that this is partially out with your control, but what steps can be taken to (drastically) shorten this period? OR, (if CAA are generally on board), to introduce it much sooner on an interim or trial basis? As it is RNAV software based, and the current beacons are becoming obsolete, it should benefit all.
d) The slides are to be treated as confidential until you had consulted with Fife. Please confirm when we can make the information available to the wider Cramond community.

2 Incoming arrivals over Cramond - you indicated this was unlikely to change. It is a major disruption for Cramond, with ever increasing flight numbers. In your proposals to CAA, are any changes/improvements included, and what comfort can we offer to our residents?

3 Night Flights - This is the source of repeated comment from residents, and (with respect), the extra costs formula is not deterring night flights. No change was anticipated, and this presumably does not form part of your submission to CAA, but something needs to be done about this major issue. The Frankfurt formula would be a good start. Your comments would be welcomed.
Thank you, and please do keep us up to date with progress and any amendments as matters proceed.

EAL Comments

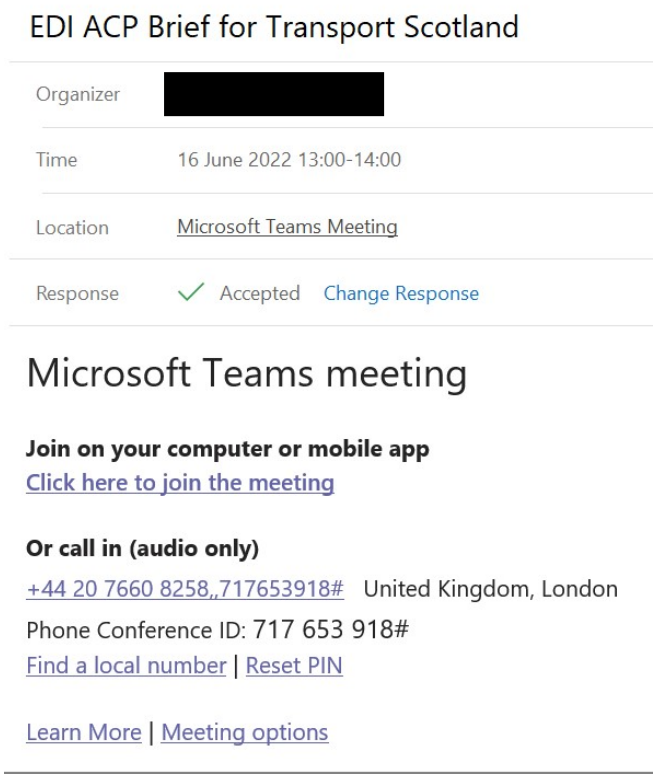
We intend to work with Cramond throughout the ACP process to achieve the best solution we can for them. We will clarify their questions about the exceptions within the design and the effects that slow moving climbing aircraft may have as depicted on the slide above. There is further work to be carried out in Stage 3 of the process to clarify some of the issues presented in this feedback such as the turn at height.

Also, the incoming arrivals and night flight question posed will be answered in our continued dialogue even though they are out with the process in CAP 1616.

Politicians local to Cramond (the MP and Local council representative) were also briefed on this possible solution on the 14th June. They were pleased that an improved solution looked to be passible and were made aware that this would be part of the ACP implementation. They requested to be kept updated with progress and thanked EAL for the briefing.

Transport Scotland 16th June 2022

Transport Scotland were briefed on the 16th June with the presentation from Engagement session 2. (Annex B)


EDI ACP Brief for Transport Scotland

Organizer [redacted]

Time 16 June 2022 13:00-14:00

Location Microsoft Teams Meeting

Response ✓ Accepted Change Response

Microsoft Teams meeting

Join on your computer or mobile app
Click here to join the meeting

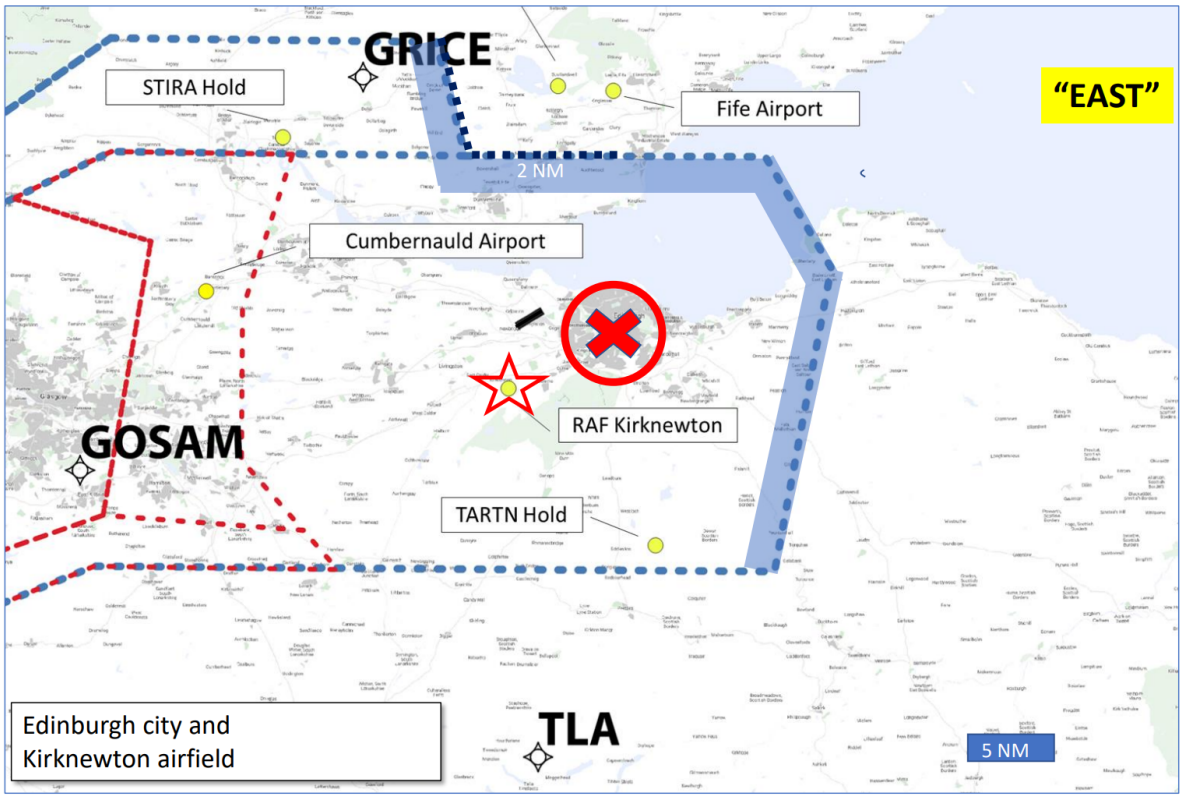
Or call in (audio only)
+44 20 7660 8258,,717653918# United Kingdom, London
Phone Conference ID: 717 653 918#
Find a local number | Reset PIN

Learn More | Meeting options

They asked to be kept informed of our progress as we moved through the Stages of the ACP and thanked us for an informative presentation. They asked about the number of noise complaints and whether this would rise once the ACP was introduced. Our response was that we wanted the number of noise complaints to reduce as we were hopeful of introducing new flight paths that would overfly less people. Also, with the introduction through time of more modern aircraft that could be flown in a more efficient way (using Continuous Climb and Continuous Descent techniques), this noise footprint should reduce. We would also take into account the areas where residential developments would be built or are planned to be built certainly over the next 10 years and beyond using up to date information.

Kirknewton / MOD

RAF Kirknewton is treated as a unique case due to its proximity to the airport and the fact that our ANSP has a letter of agreement. The airfield is a well-established glider site and also facilitates the arrival and departure of light aircraft. An illustration of the location of RAF Kirknewton was given in our engagement sessions and the briefing slide is shown below.



In looking at SID options there is a possibility of flying over or through Kirknewton airspace when it is inactive or designing a SID to route around their area of operation.

Our feedback from the Officer Commanding Kirknewton is detailed below.

Name: [redacted]

Date: 11 Jun 22

Organisation represented or attending in an individual capacity:

Aerodrome Operator for RAF Kirknewton (EGKN). Whilst my comments are provided for EGKN from an operator and users perspective, my comments do not form the opinion or further comment on behalf of, or from the wider MOD, which will come direct from DAATM at Gatwick.

Please fill in the form as appropriate answering the questions asked and provide any further comments in the space provided

Was the purpose and content of the engagement clear?

Yes

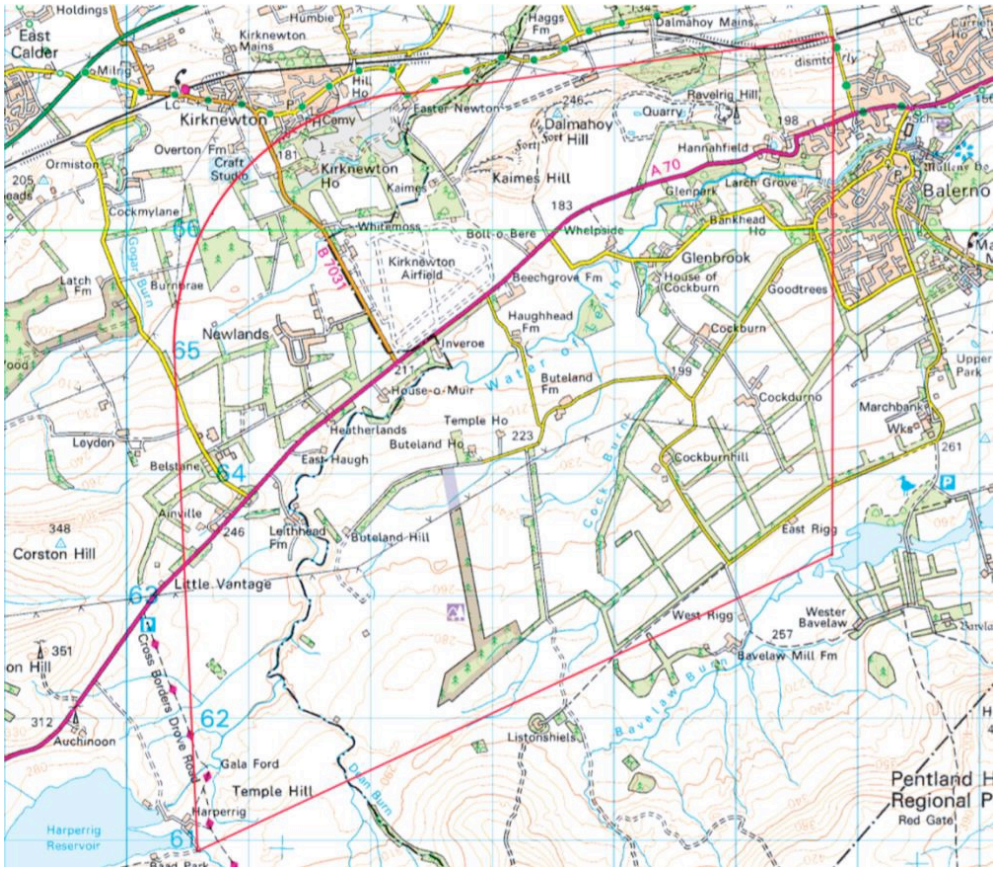
We have included all of the departure and arrival options in the engagement material attached. Do you have feedback on our long list of options for departures or arrivals? Perhaps as an individual option or as a combination to provide capacity?

I don't have any concerns with any of the options outside of EGKN per sa, and my comments won't address any enviromental, efficiency or noise impacts, as that will not affect our operations. EGKN is active from a 2 Flying Training School (2 FTS) perspective every weekend and Public Holiday. In addition, 2 FTS will conduct a few mid-week courses throughout the year (approx 4-5 weeks) based around school holidays.

When EGKN is not active, if it aligns with all the DPs, then there should be no issues with departure routes flying directly over EGKN. Certainly when we are not active, 2 FTS would support that; however, when EGKN is active we have operated with a Designated Gliding Area (DGA) via LoA which is depicted below. The DGA extends up to 3700ft AMSL on EDIs QNH. We would need to keep access to the DGA when active, and especially when mid-week courses are taking place, and I wouldn't want to see a refusal of the DGA being opened in favour of a SID that takes flights directly over EGKN.

Finally, the DGA is quite restrictive in terms of lateral availability, if possible I would welcome the DGA being increased under certain conditions.

RAF Kirknewton DGA (depicted by red line):



There are some other adhoc mid-week movements for a Civil Flying Group which would be via clearance from EDI ATC, but as long as there is flexibility to change SIDs to keep the area clear, for example, if they need to do circuits, or to give them access to airspace, then there shouldn't be too much issue for this small minority.

The environmental design priciples were discussed in this presentation (DP's 7-13 and DP15). Their application is applied qualitatively in Stage 2 and then with further numeruical analysis in Stage 3. Do you have any specific comments for these design principles? This could involve the methodology of how they are applied to the design?

No – I thought the way you discussed the DPs was fine, and I also liked to see the resultant increase in capacity and what benefit it brings to the Airport.

Were the next steps of this ACP clarified and do you have any further comments or questions?

Yes and no further comments/questions thank you.

This feedback was positive from Kirknewton as long as we remain clear when the airfield is active. We also received further feedback from the MOD as detailed below:

Name: Sqn Ldr Kate Read

Date: 15 Jun 22

Organisation represented or attending in an individual capacity: MOD

Please fill in the form as appropriate answering the questions asked and provide any further comments in the space provided

Was the purpose and content of the engagement clear?

Yes, it was all clearly explained. I thought tht the way the current operations were described/presented was particularly good for adding context of considerations.

We have included all of the departure and arrival options in the engagement material attached. Do you have feedback on our long list of options for departures or arrivals? Perhaps as an individual option or as a combination to provide capacity?

MOD has no particular view on departure and arrival options, noting that AO Kirknewton has provided comments seperately.

The environmental design priciples were discussed in this presentation (DP's 7-13 and DP15). Their application is applied qualitatively in Stage 2 and then with further numeruical analysis in Stage 3. Do you have any specific comments for these design principles? This could involve the methodology of how they are applied to the design?

MOD has no comments on environmental design principles.

Were the next steps of this ACP clarified and do you have any further comments or questions?

Yes, it's clear what happens next and MOD is happy to participate in engagement throughout the process. The requirements captued in FDP14 capture the factors that are important to broader MOD stakeholders.

EAL Comments

EAL have numerous options of SIDs and will examine the prospect of a SID that would fly over Kirknewton when closed but change its path if the airfield is open. Also, we will examine jut having a SID that routes around Kirknewton. These SID's (all to TALLA) would need to be assessed against the baseline SID which already routes around Kirknewton. Our maximum forecast departure capacity can be reached without an early turn if we have approval to reduce the departure interval to 1minute 30 seconds. In this case the SID that routes around Kirknewton would become the chosen option. Having just this one option towards TALLA is much more straightforward from a planning, human factors and efficiency point of view. This therefore removes any possible hazard identified with the publication of two SIDs routing from the same runway with the same endpoint.

ANSL our ANSP provider would also prefer the single option and the removal of any potential risk associated with clearances being cancelled and reissued at short notice.

Further Engagement responses

Date: 25/5/2022

Organisation represented or attending in an individual capacity: **EANAB AAN sub-group**

Please fill in the form as appropriate answering the questions asked and provide any further comments in the space provided

Was the purpose and content of the engagement clear?

In the most part, yes. As this was the first time that Arrivals had been presented in any detail there were some symbols and terminology that was new to me. It was good to move on from "swathes" to more specific tracks, even if these are more conceptual at this stage.

We have included all of the departure and arrival options in the engagement material attached. Do you have feedback on our long list of options for departures or arrivals? Perhaps as an individual option or as a combination to provide capacity?

The smiley/unsmiley faces used in evaluating the Departure options were helpful and it was hard to see any situation where one of the options with an unsmiley face might take preference over an alternative with no unsmiley face, but the devil is in the detail especially as the numbers overflown by each option were not yet included.

It would seem that a thin additional strip of CTA on the eastern edge would be helpful in easing the tightness of some options there.

The Arrivals routes, especially those for R24 passing over Midlothian, have not progressed as far as Departures seem to have. The focus appears to be on some kind of T-Bar system, but four options were given in slide 67 and I wasn't clear why three seemed not to be being considered. It would be good to discuss the T-Bar method at a sub-group meeting.

The environmental design priciples were discussed in this presentation (DP's 7-13 and DP15). Their application is applied qualitatively in Stage 2 and then with further numeruical analysis in Stage 3. Do you have any specific comments for these design principles? This could involve the methodology of how they are applied to the design?

The smiley/unsmiley faces could be used again as an indicator of the number of people overflown, and in deed possibly others environmental factors

Were the next steps of this ACP clarified and do you have any further comments or questions?

Yes

Edinburgh Airport Comment:

We are always willing to discuss any agenda item at subgroup meetings and are happy to expand on arrival options.

Date: **14 Jun 22**

Organisation represented or attending in an individual capacity:

Guild of Air Traffic Control Officers (GATCO). Our primary concern is on the impact of changes on controller working practices and workload.

Please fill in the form as appropriate answering the questions asked and provide any further comments in the space provided

Was the purpose and content of the engagement clear?

Yes however I missed the start of the session due to my IT issues with Teams so my comments and questions may reflect he fact that I may have missed some details in the opening statements.

We have included all of the departure and arrival options in the engagement material attached. Do you have feedback on our long list of options for departures or arrivals? Perhaps as an individual option or as a combination to provide capacity?

Not at this stage and GATCO would like to hear the EDI ATC view however as a general principle, we think it highly desirable to avoid conflict between: i) arrival and departure routes; ii) other units' routes and procedures; and iii) areas of aerial activity such as RAF Kirknewton.

The environmental design priciples were discussed in this presentation (DP's 7-13 and DP15). Their application is applied qualitatively in Stage 2 and then with further numeruical analysis in Stage 3. Do you have any specific comments for these design principles? This could involve the methodology of how they are applied to the design?

T*his comment does not represent GATCO's position and is a personal view.*

These DPs have the potential to be in conflict eg the noise DPs and the carbon reducing DP therefore on what data will the metrics be based and how will the metrics be used? If there is intent to set targets then qualitative will be of little value because of subjectivity. Quantitative metrics allows for consistency across a wider population and enables target setting. If this happens, there is likely to be an impact on controller and pilot workload which, in my opinion, is not desirable.

The use of quantitative metrics makes for elegant solutions but is likely not represent the messy and complex realities!!

Edinburgh Airport Comment:

Aircraft noise is the most pressing concern below 7000 feet so flightpaths will be designed with this in mind. We will also try to reduce overflying population centres at lower levels because of health concerns. We are working to keep arrival and departure routes separate, we are also working with Glasgow and NERL for a joint and deconflicted solution and we are well aware of Kirknewton and their requirements who have their own section in this engagement response.

Date: 22nd June 2022

Organisation represented or attending in an individual capacity:

Ecclesmachan & Threemile town Community Council

Please fill in the form as appropriate answering the questions asked and provide any further comments in the space provided

Was the purpose and content of the engagement clear?

Yes.

We have included all of the departure and arrival options in the engagement material attached. Do you have feedback on our long list of options for departures or arrivals?

Perhaps as an individual option or as a combination to provide capacity?

Focussing on the impact of RWY24 departures, the geographic situation is such that any route option including an early right turn cannot avoid causing an increase in aircraft noise over populations.

EDI comment: We will look to avoid overflying populations at low levels. Noise is a priority below 7000 feet.

The environmental design principles were discussed in this presentation (DP's 7- 13 and DP15). Their application is applied qualitatively in Stage 2 and then with further numerical analysis in Stage 3. Do you have any specific comments for these design principles? This could involve the methodology of how they are applied to the design.

What is the qualitative methodology for the application of DP's 7 to 10 in stage 2? How do you qualitatively account for aircraft noise in relation to populations?

EDI comment: We have used swathes as departure options to enable maximum flexibility in the final designed flight path. We for instance score a red if an aircraft routes over a population centre at low level as they would for instance if they turned right on departure from Rwy24 affecting Winchburgh.

In Stage 3, when numerical analyses is carried out to better quantify the noise impact of proposals over populations, what departure profiles of height, speed and thrust will be assumed?

This will be decided in the planning of Stage 3 and we shall make reasonable assumptions.

Were the next steps of this ACP clarified and do you have any further comments or questions? The next steps of the ACP were clarified.

Question 1: During the presentation, it was mentioned that the airport would like "to look at the way aircraft depart and the power they use" but it was also said this was not within the scope of the ACP. Can you confirm that the airport will not therefore look into this as part of this ACP?

EDI Comment: We are looking at FADP and how this can affect departures. This is not part of the ACP but is work we shall do as part of our trusted neighbour pillar in the sustainability programme.

Question 2: Work by EANAB has shown that a very significant reduction in aircraft noise can be achieved at EDI by using lower power (LGW like) departure profiles. How do you get over the contradiction of claiming to minimise aircraft noise while implementing departure profiles which do not minimise aircraft noise?

EDI Comment: I refer to the previous answer. Also, if we can eradicate early tuns this helps with population overflown.

Question 3: An increase in capacity can be brought by reducing departure separation. Is it not also likely to result in departing aircraft using more power to “get out of the way” and therefore increasing noise over populations?

EDI Comment: No aircraft will not need extra power and will not rush. We hope this reduction in time interval gives us capacity and therefore keeps us to a maximum number of 4 SIDs, rather than developing more for and therefore affecting more people.

Question 4: During the last two presentations, it was mentioned that RWY24 departures could be made to “better exploit the M8 corridor”. What is meant by this? In what locations do you see a better way to keep aircraft over the M8 motorway?

EDI Comment: There is an opportunity for Rwy24 departures to overfly the M8 corridor rather than fly along the runway centreline as they do at the moment. The M8 corridor would have minimal population underneath the flightpath compared to the people currently overflown with both Rwy06 arrivals and Runway 24 departures. This is in effect respite by design.

Date: 17 June 2022

Organisation represented or attending in an individual capacity: EANAB

Please fill in the form as appropriate answering the questions asked and provide any further comments in the space provided

Was the purpose and content of the engagement clear?

The purpose was, but in terms of content, quite a few of the slides were not clear in that I did not understand them. Comments of specific slides are:

Slide 7 – EDI = Airspace + ATC + Routes – what does this mean?

EDI Comment: This slide just demostrated that the solution wopuld be a mix of different idsues and priorities.

Slides 13 to 16 - They compare 2019 ATMs with those estimated for 2027 and indicate that the runway capacites are likely to be close to their limits at certain times of the day, which is one of the key drivers for this ACP – that is, the need for more runway capacity. Clearly, a huge amount of work has gone into creating these forecasts and in generating the potential business to sustain them. However, there is little evidence that thay have taken into account 2 key considerations of fundamental importance to the overflown communities:

- EANAB have, and continue to consider the need for additional capacity has not been demonstrated.
- The Scottish Government acknowledges that flight numbers will have to be considered if their environmental targets are to be achieved, as noted in the following extract from EANAB's Annual Report for 2021:
  "Transport Scotland's decarbonisation report was raised ……. noting the net zero target by 2045 with an interim target of an aviation emissions fall of 33% between 2019 and 2030. It added the technology is not there to achieve this in the aviation sector and therefore flight numbers and patterns will have to be looked at."

This latter point indicates that EDI will have to actively employ demand management to achieve these targets. These slides show little evidence of this.

EDI Comment: The need for additional capacity has been demonstrated in the forecast figures for both arrivals and departures which exceed the current situation. We will alos need to liase with the Scottish Government with regard to your pint made on aviation emissions. The remit of this ACP is to modernise the airspace, provide the required capacity and take account of environmental factors.

None of the slides included the option promoted by myself and another participant in the previous Stakeholders Engagement as referred to in my feedback on that session's slide 27 - *the lower option for 3 exit points off runway 24 and 4 off runway 06 is what EANAB have*

been promoting for years as it provides the option of flying straight out down the Forth estuary. You will recall this principle was raised by another stakeholder (from the Light Aircraft Association) at our event earlier this year when he advised it was definitely worth exploring.

EDI Comment: We need to look at the same number of SIDs from each runway end for reasons of standardisation, capacity, best practice and reducing the possibility of any error due to human factors.

We have included all of the departure and arrival options in the engagement material attached. Do you have feedback on our long list of options for departures or arrivals? Perhaps as an individual option or as a combination to provide capacity?

Yes, it looks like you have included all the likely options in diagramatic form at this stage.

The environmental design priciples were discussed in this presentation (DP's 7-13 and DP15). Their application is applied qualitatively in Stage 2 and then with further numeruical analysis in Stage 3. Do you have any specific comments for these design principles? This could involve the methodology of how they are applied to the design?

My comments on the DPs are:

I do not see how the Design Principles can be applied at this stage other than to say that some of the option diagrams could have the potential to satisfy the DPs to varying degrees. In other words it is not possible to meaningfully apply the DPs unless they are being considered againts actual, proposed flight paths.

EAL's environmental consultant's lack of understanding of WebTAG was concerning, given its central importance as an evaluation tool for analysing the impact of DP's on the flight paths.

Prior to the analysis being conducted, can we see the maps that will be used for assessing the impact of flight paths on sensitive areas, to estabalish all the information passed by our communities to EAL have been incorporated?

EDI Comment: We will continue to engage and work with communities to assess the impact of flight paths on sensitive areas through continual engagement. WebTag is a complicated subject and experts from the environmental consultancy will be employed in this work. You are correct to say that some design principles are difficult to apply at this stage.

Date: 31-05-2022

Organisation represented or attending in an individual capacity:

SRUC – Oatridge Campus

Please fill in the form as appropriate answering the questions asked and provide any further comments in the space provided

Was the purpose and content of the engagement clear?

Yes. As a stakeholder in this engagement we appreciate being kept in the picture and that our views are recognised.

We have included all of the departure and arrival options in the engagement material attached. Do you have feedback on our long list of options for departures or arrivals? Perhaps as an individual option or as a combination to provide capacity?

For a "non-aviation" organisation the options felt pretty exhaustive. We understand the need to look at all options and their effects on departure and arrival times, however for us it seems the basic principle would be to use the Forth Estuary and M8 corridor routes (to the West of Bathgate/Armadale before turning North or south) which you have highlighted as much as possible as this in our opinion is likely to result in the least number of population or green space flyovers and appears also to be a reasonably good compromise in respect of your objectives for increased capacity based on the stats you supplied.

This would also help with flyover concerns regarding the massive new housing developments in Winchburgh, Broxburn and other local areas which also include several new schools as you will be aware.

The environmental design priciples were discussed in this presentation (DP's 7-13 and DP15). Their application is applied qualitatively in Stage 2 and then with further numerical analysis in Stage 3. Do you have any specific comments for these design principles? This could involve the methodology of how they are applied to the design?

DP 10: Will this include cognisance of schools and colleges? Per above there are 2 new secondary schools and a pimary approaching completion in the Winchburgh development alone. We have a campus which is approximately three quarters of a mile long and around half a mile wide, covering 283 Hectares. The campus consists of number of designations from Animal Care, Equine, and a fully functioning farm with Beef, Pigs and Sheep, there are also Student Residences with around 300 beds and a student population of around 600. We would like Oatridge Campus to be named within this DP and recognised in the process overall for your ACP project.

Were the next steps of this ACP clarified and do you have any further comments or questions?

Yes, we await further communication in due course.

We would imagine that there will be further housing developments on the ground below the airspace in the next few years also, so to prevent lengthy and costly repeats of this process it would surely be prudent at this time to consider the M8 and Forth Estuary options as best outcomes given that they cannot be built on or further developed.

EDI Comment: We thank you for your correspondance and feedback. As we look to minimise overflying population centres then we shall indeed avoid the population centre you mention. We are also avoiding sensitive areas. What we cannot do now is change our design principles and mention specific areas but we will be doingthis in our public consultation I can uaasure you that the design principles will be applied and aircraft noise is the top environmental concern up to 7000ft.

Date: 14th June 2022

Organisation represented or attending in an individual capacity:

Fife Council, Environmental Health

Please fill in the form as appropriate answering the questions asked and provide any further comments in the space provided

Was the purpose and content of the engagement clear?

We have included all of the departure and arrival options in the engagement material attached. Do you have feedback on our long list of options for departures or arrivals? Perhaps as an individual option or as a combination to provide capacity?

It is our opinion that flying over the South coast of Fife should be limited as much as possible, due to the low background levels there and to protect the amenity of the beaches.

RWY 06 3xt - #1 had too much overfly, we would prefer #4 or 4xt #3.

RWY 24 3xt#1 was good for us but we are not keen on the others. The same for 4xt #1-9. #10-13 were better.

The environmental design principles were discussed in this presentation (DP's 7-13 and DP15). Their application is applied qualitatively in Stage 2 and then with further numeruical analysis in Stage 3. Do you have any specific comments for these design principles? This could involve the methodology of how they are applied to the design?

No comments to make

Were the next steps of this ACP clarified and do you have any further comments or questions?

The steps are clear and have no further comments to make

EDI comment: We thank you for your participation. We will look to minimise overflying population centres and understand your concerns with the options you have mentioned.

Date: 16 June 2022 (session 9 June 2022)

Organisation represented or attending in an individual capacity: individual

Please fill in the form as appropriate answering the questions asked and provide any further comments in the space provided

Was the purpose and content of the engagement clear?

Reasonably clear however the purpose came over as EAL trying it's best to reduce noise/flights over Cramond which was repeatedly and presumably jokingly referred to as "Edinburgh City Centre".

The flight path options were not always easy to follow in the space of time allowed.

All content was more relevant than information provided by a 3rd party for the previous ACP and believe that by having someone knowledgable in the industry involved and presenting is an improvement.

We have included all of the departure and arrival options in the engagement material attached. Do you have feedback on our long list of options for departures or arrivals? Perhaps as an individual option or as a combination to provide capacity?

EALs desire to increase capacity with shorter departure intervals is of huge concern to Blackness residents already struggling with the number of flights over head.

From my understanding of the options presented, it would appear to be better for Blackness if those departing on GOSAM were to turn right flying south instead of left and over us.

The environmental design priciples were discussed in this presentation (DP's 7-13 and DP15). Their application is applied qualitatively in Stage 2 and then with further numeruical analysis in Stage 3. Do you have any specific comments for these design principles? This could involve the methodology of how they are applied to the design?

There is concern that by concentrating the flight paths, the same poor people will not get any respite. There is no mention of respite from or reduction of night flights.

Were the next steps of this ACP clarified and do you have any further comments or questions?

Not clear how the QOL is being handled.

DP 7 mentions "health and QOL" however there seems to be a mismatch with the aim to concentrate flights over a narrow population vs the recommendation of flying over a broader population to reduce annoyance and heart/sleep issues as mentioned by James Ellaway – this needs to be explored and clarified in an open and transparent way with all up to date research and literature on the health impacts of noise disturbance on the Scottish population (a population that already has heart disease as one of the leading causes of death and a major mental health crisis on it's hands with which there is a close relationship with sleep deprivation).

Blackness has 2 historic heritage sites (HES Castle and National Trust House of Binns), green spaces (access point for the John Muir Way which runs east and west through the area) and a primary school.

EDI Comment: We appreciate the concerns mentioned in this feedback and can assure you that reduction in aircraft noise is the priority below7000 ft. This involves minimising population overflown and as such this will also improve QOL. The less porple overflown, certainly at lower levels, the more the improvementon their QOL. This is why we are looking to decrease our departure interval to increase cpascity without introducing new SIDs or early turns over populations at lower levels.

Respite can come from design or from flying SIDs at night that affect the least amount of people. All options are open and we shall do mour best with the design principles.

Date:1st June 2022

Organisation represented or attending in an individual capacity:

Cumbernauld Airport

Please fill in the form as appropriate answering the questions asked and provide any further comments in the space provided

Was the purpose and content of the engagement clear?

Yes, and well presented in plain English.

We have included all of the departure and arrival options in the engagement material attached. Do you have feedback on our long list of options for departures or arrivals? Perhaps as an individual option or as a combination to provide capacity?

At this early stage the potential impact on Cumbernauld Airport isn't clear so until any new airspace is announced it's difficult to form an opinion.

The environmental design priciples were discussed in this presentation (DP's 7-13 and DP15). Their application is applied qualitatively in Stage 2 and then with further numeruical analysis in Stage 3. Do you have any specific comments for these design principles? This could involve the methodology of how they are applied to the design?

No comment.

Were the next steps of this ACP clarified and do you have any further comments or questions?

Yes, the way forward was clear though I comment with prior knowledge of CAP1616.

EDI Comment: Wee thank Cumbernaild for their participation and wish them well with their own ACP.

Date: 04/04/2022

Organisation represented or attending in an individual capacity:

I have been requested to feedback on behalf of Prestwick Airport regarding your current ACP.

In general, we are comfortable with everything proposed, and are keen to continue to be involved in the process.

It is unlikely that many of the proposed changes will have much of a direct impact on Prestwick Airport, but we will be in conjunction with NERL engage if opportunities exist for Prestwick traffic to benefit from more fuel-efficient routings.

I would also be cognisant of a potential concern for you later in the process.

From our own ACP the SID were "truncated". This is primarily to allow aircraft to reach termination point of the SID earlier so that they could get uncoordinated route changes or climbs earlier. The result for us is SID's that have different termination points and link routes dependant on Runway in use, that means aircraft flight plans are Runway dependant and clearances are **far** more convoluted and get questioned by pilots regularly. An Automated clearance delivery system would reduce the burden of this, but I would suggest that there would still be an increase in verbal confirmation of clearances as a result.

Further Input

Date 09/06/22

Prestwick Airport ATC

Please fill in the form as appropriate answering the questions asked and provide any further comments in the space provided

Was the purpose and content of the engagement clear?

Yes

We have included all of the departure and arrival options in the engagement material attached. Do you have feedback on our long list of options for departures or arrivals? Perhaps as an individual option or as a combination to provide capacity?

No specific comments to make; on the basis of what has been presented so far I don't envisage any adverse impact on the ATS operation at Prestwick Airport.

The environmental design principles were discussed in this presentation (DP's 7-13 and DP15). Their application is applied qualitatively in Stage 2 and then with further numerical analysis in Stage 3. Do you have any specific comments for these design principles? This could involve the methodology of how they are applied to the design?

No comments to make.

Were the next steps of this ACP clarified and do you have any further comments or questions?

No questions/comments at this stage.

EDI Comment: We thank Prestwick Airport for their participation and appreciate they have nothing further to add from Sessions 1 and 2. We intend to use the same number of SIDs and the same exit points from each runway.

Date: 2ND JUNE 2022

Organisation represented or attending in an individual capacity: WINCHBURGH DEVELOPMENTS LIMITED

Please fill in the form as appropriate answering the questions asked and provide any further comments in the space provided

Was the purpose and content of the engagement clear?

Yes

We have included all of the departure and arrival options in the engagement material attached. Do you have feedback on our long list of options for departures or arrivals? Perhaps as an individual option or as a combination to provide capacity? The environmental design principles were discussed in this presentation (DP's 7- 13 and DP15). Their application is applied qualitatively in Stage 2 and then with further numerical analysis in Stage 3. Do you have any specific comments for these design principles? This could involve the methodology of how they are applied to the design?

PPCA Ltd has been instructed by Winchburgh Developments Ltd to lodge comments to the latest consultation on the Airspace Change Programme published by Edinburgh Airport. As a reminder, Winchburgh Developments Ltd is a principal landowner and the development manager for the strategic expansion of Winchburgh in West Lothian. Planning permission in principle was granted in April 2012 by West Lothian Council as planning authority for – Planning Permission in Principle for a 352 hectare development including. residential, commercial, industrial, recreation & retail uses, community facilities, landscaping & open space, road and rail infrastructure, including M9 junction, train station, park & ride, primary & secondary schools on Land around, Winchburgh Both BAA and Edinburgh Airport are fully aware of the strategic expansion of the settlement having been heavily involved in the masterplan and public consultation process involved in the period leading up to the 2012 grant of planning permission in principle.

The strategic expansion of Winchburgh, as part of a wider 5,500 Core Development Area allocation including land to the south at Broxburn, is a fundamental part of the Council planning and infrastructure strategy to meet housing need and demand and education provision in the area for the next 20 plus years and beyond. Implementation of the Winchburgh planning permission is underway with over 700 new residential dwellings, a new neighbourhood centre and marina complete. A new school's campus is also due to open this years as is a new motorway connection on to the M9 for the expanding settlement. The new school's campus are all phase 1 buildings, comprising a single-stream primary school/preschool intake and two 660 pupil capacity secondary schools. They are designed to be extended in the future to have a two-stream primary school/pre-school and two 1,210 secondary schools. S1 and S2 will be moving into the secondary schools this year and the new primary school will accommodate the entire denominational school population of the Holy Family Primary School. The scale of the project – it will expand the size of the original village by circa 900% to circa 14,000 persons - and infrastructure required for delivery will take a

further 10-15 years to deliver in full and is the subject a comprehensive set of suspensive planning conditions and a Section 75 legal agreement. Winchburgh Developments Limited recognises the operational requirements of the Airport and its ambitions to expand in coming years. This is welcomed as a significant economic benefit to the surrounding area. Winchburgh Developments Limited, further, recognises that the Airport is following due process in coming to conclusions on airspace change and that environmental, social and heritage concerns form a fundamental part of that decision making process. As before, Winchburgh Developments Limited would draw attention, firstly, to the published drivers for airspace change with specific reference to the need to minimise environmental impact in terms of the total number of people overflown, as well as when and how often they are overflown –while also cutting average CO2 emissions. Secondly, Winchburgh Developments Limited would highlight Design Principles FD7-10 in relation to minimising environmental impact, population and sensitive receptors (e.g., schools) to be overflown. Taking all of the above into account, and considering the options presented for departures and arrivals as part of the ongoing consultation, it is clear from a design and technical perspective that there are options available to Edinburgh Airport to avoid any risk of overflying the expanding Winchburgh settlement. That position is endorsed and supported by Winchburgh Developments Limited as a position to be adopted moving forwards in this process.

EDI Comment:

Edinburgh Airport appreciates this input from Winchburgh Developments Limited and notes your comments about minimising environmental impact in terms of the number of people overflown as well as cutting CO2 emissions. Our process looks at residential planning and indeed needs to be fit for purpose looking forward for 10 years after implementation.

Date: 29/04 2022

Glasgow ACP Team

ACP-2019-32

Survey Questions

Stage 2A

Have we taken account of the design principles when developing our comprehensive list of route options?

Yes, from the material available, it appears that the design principles have been considered.

Are there any further considerations that relate to the Design Principles which we should take into account?

Not at this stage, however, it will be useful to see more detailed design ideas and the corresponding Design Principle Evaluation outputs.

Please outline what worked well in this engagement process and how can Edinburgh Airport improve its engagement in the future?

Engagement sessions were well-organised and conducted in an open and positive manner which allowed for questions, challenge and further explanation.

Do you have any further comments or feedback?

We appreciate the efforts that Edinburgh International Airport are making in working with stakeholders throughout the ACP process. In particular, liaison with the ACP team for Glasgow International Airport has been excellent and productive throughout. We look forward to continued positive engagement with EAL.

EDI Comment: We appreciate your participation in our engagement and look forward to working with you as the Scottish ACP cluster moves forward.

Date 16/06/2022

NERL

EDI ACP Stage 2 Session 2 Feedback Form

ScTMA Airspace Implementation Manager

Organisation represented or attending in an individual capacity: NERL

Please fill in the form as appropriate answering the questions asked and provide any further comments in the space provided.

Was the purpose and content of the engagement clear?

Indication of potential for more arrivals via STIRA not clear – has consequential overflown impact been considered?

We will consider overflown impact during stage 3 when we have figures from NERL about this possible increase. We need some possible figures for this.

Expected use of low-level hold options not clear – was this as contingency only such as go arounds?

These low-level holds were there as a contingency only.

The arrows could have represented as swathes to remove any potential ambiguity over specific tracks over the ground when not within PH ACP

We used dotted arrows to signify the possible change in the location of the TARTN and STIRA holds and the movements of possible aircraft streams. Any adjustments would be small and we don't think broken arrows can be misrepresented as actual flightpaths.

We have included all of the departure and arrival options in the engagement material attached. Do you have feedback on our long list of options for departures or arrivals? Perhaps as an individual option or as a combination to provide capacity?

Focus appears to be on the use of TLA for traffic to the SE (NATEB) and not the use of a TUTOR style dep. (discussion of possible re introduction in our joint workshops)

The option for the TLA SID remains and is subject to further appraisal. Airline feedback is not positive because of the impact of further track miles. Also, this would mean communities to the North would see an increase in traffic overflying them and communities to the south much less so going against our dispersal design principle.

The ability to use 3nm separation has a potential to provide an increase in capacity – 3nm required without coordination – radar resilience – safety case work to date to achieve this?

We have spoken to the CAA about this. Coordination currently is because of ATCO's being valid in both Manchester and Scottish TMA. The Manchester TMA is more complicated requiring coordination and so coordination is required in the Scottish TMA due to the

human factors issue. This idea of 3nm separation is a possibility and would need further safety case work.

Principle for building capacity is based on early turn after departure, are PH looking to challenge 45 degs after departure for 1 min splits?

We are looking more at departure splits away from the airfield that would reduce noise issues for our communities. We believe we can achieve our capacity requirements with a reduction in the timed departure separations.

Requirement for additional CAS via STIRA may not be required if deps/arrivals systemised (Slide 73) or an amended T bar/vectored? Arrivals from STIRA via overhead may have a consequential impact on deps/arrivals & hence capacity– This is unlikely to align with the NERL concepts/proposals and may introduce additional track mileage - is this a vectored or fixed transition?

We will have a combination of both vectoring and systemisation and will need to look at the issues with more departures from the north against SIDs. It may be a case of Edinburgh Approach only releasing traffic to the EAST SID once radar separated from inbounds.

Arrivals from East captured but no reference to a corresponding hold - was this deliberate? Are you anticipating a hold above 7000ft i.e. within NERL ACP?

We would anticipate a corresponding hold being part of the NERL ACP and above the level of any designed SID (and certainly above 7000 ft).

Do the options provide sufficient respite are you looking at combination of 'standard' and early turns

SIDS e.g., comparison of Slide 53 & 54?

We are looking at how the combination of standard and early turns work with capacity and believe we can achieve this with standard turns and reduced timings between departures.

Is the use of time banding still being considered? Have these been discounted?

We may use time banding for a TALLA SID from Rwy 24 to solve the Kirknewton issue, but this may not be necessary. We may also use the quietest SID overnight for respite purposes.

Has Point Merge been discounted entirely – the presentation and accompanying narrative did not make this entirely clear – will PM remain within options submission?

Point Merge has been discounted because of the volume of controlled airspace required, the possible lack of flexibility for arrivals which may reduce capacity and the need to position the systemised airspace in the airport overhead. This would affect departures.

GRICE departures - any straightening out of the SID with additional CAS would be supported.

Thankyou

Slide 82 references Exit points and holds – but no reference to TUTOR style departure or a FoF hold

Scenario

Slide 84 references extra CAS to the east and again we believe the FoF hold will be part of the NERL ACP and above 7000ft (Also over water). A "TUTOR" style departure is included in slides 53, 54 and 55.

The environmental design principles were discussed in this presentation (DP's 7-13 and DP15). Their application is applied qualitatively in Stage 2 and then with further numerical analysis in Stage 3. Do you have any specific comments for these design principles? This could involve the methodology of how they are applied to the design?

Bringing traffic from STIRA back to the overhead is unlikely to satisfy most of your DP's. Restricting the ACP to existing CAS may restrict opportunities to deliver further environmental benefit.

We shall try to increase our volume of CAS to the north in order to systemise inbounds. We are aware of the effect on our design principles of aircraft transiting through the overhead for downwind left for Rwy24 but if we don't get our increase in controlled airspace then we will need to keep this option. Further analysis in Stage 3.

Were the next steps of this ACP clarified and do you have any further comments or questions?

Assessment of safe departure intervals from 2 mins to 1.5 mins may have a significant impact to the NERL receiving sectors. If CAA endorse, they are likely to request that NATS (ScTMA and downstream sectors) could cope with this and possible precedent for other airfields. NATS would need to impact assess via the Dev simulations

We have spoken to the CAA who are positive about this. It will need an SI for Mats Part 1 and further work and safety assessments in SIMs etc, but this is by far the best solution for our communities and brings us the capacity we need.

Will EGPH be introducing OMNI deps for non RNAV 1 a/c?

We already have NPR's for aircraft that cannon accept SIDs. If we need additional OMNI Deps then we shall look at these as we make progress

NERL comments in green.

EDI Comments in blue

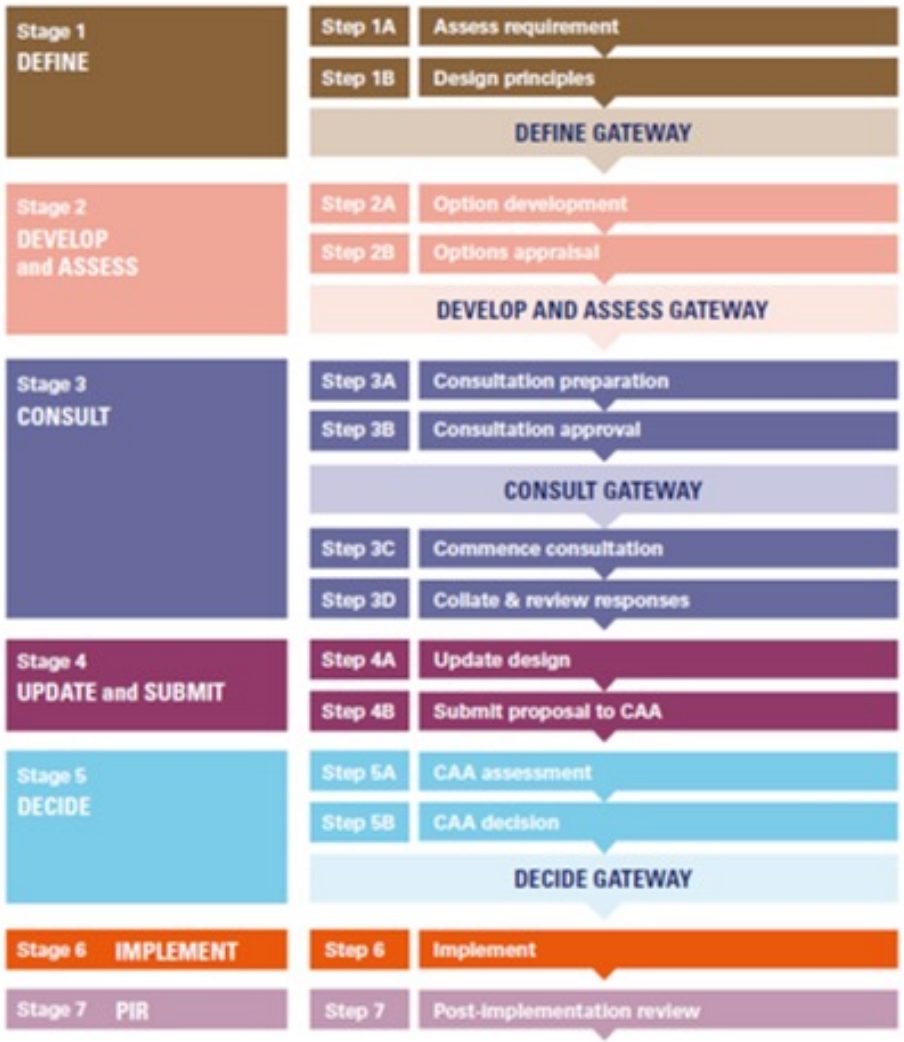
MODERNISING
OUR SKIES

Edinburgh Airport
Where Scotland meets the world

Annex A
Airspace Change Programme

- Stage 2: Options development
- Stage 2a: Initial testing with stakeholders of option-outlines

Programme Approach CAP 1616



Edinburgh Airport
Where Scotland meets the world

Masterplan Iteration 2
NERL, Glasgow

- Airspace Modernisation Strategy CAP1711
- Aim Method and Ends to be acheived
- Maintaining and enhancing high aviation safety standards
- Securing the efficient use of airspace and enabling integration
- Avoiding flight delays by better managing the airspace network
- Improving environmental performance by reducing emissions
- Better managing noise
- Facilitating defence and security objectives

Masterplan Iteration 2

Written by ACOG

Accepted by the CAA (Jan 2022)

Identify where ACP's are required

Identify interdependencies

Identify potential conflicts

Determine trade offs

Stage 2A – Options Development

The change sponsor develops one or more options that address the Statement of Need and align with the defined design principles

Identify all possible route options

Gathers feedback on the design options from stakeholders

Have the design principles been applied correctly ?

Drivers for the airspace change

1. “PBN”	Modernise airspace	*“to meet technical requirements”*
2. Airspace capacity	Reduce delays, prepare for future growth	*“can meet existing and future demand by increasing the capacity of its runways and allow flights to depart with fewer delays and environmental impacts .”*
3. Environment	May minise environmental impact	*“in terms of the total number of people overflown, as well as when and how often they are overflown – while also cutting average CO2 emissions.”*

(Source: Statement of Need)

Driver 1: Modernise airspace

- Aircraft use beacons and ATC instructions to navigate
- Ground-beacons will be phased out in near future
- Introducing RNAV routes (GPS navigation)
- Systemize airspace system (less vectoring → less instructions → less workload)
- Concentrate aircraft on route, more predictable flight path

- Deconflict routes ?
- Accommodate RNAV-capable aircraft only

Driver 2: Reduce delays, prepare for future growth

- Decreasing departure interval (less time between successive aircraft taking off)

- Separate routes for fast and slow aircraft ?
- Safe interval between successive departures ?
- Split-point of departure routes ?

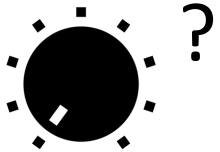
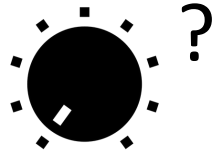
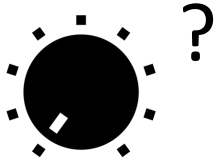
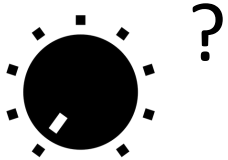
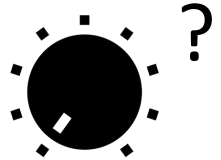
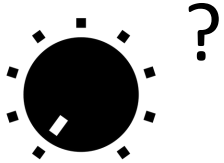
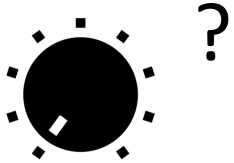
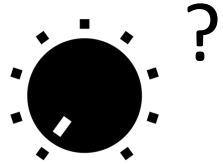
- Currently 2 minute departure separations

Driver 3: (May) minimise environmental impact

- *“Reduce the number of people overflown”*
- *“When and how often they are overflown”*
- *“Cutting average CO2 levels”*

- Where do we draw the route ?

EDI ACP = Airspace + ATC + routes

	Airspace system	ATC system	Route system
1. Modernise airspace			
2. Reduce delays, prepare for future growth			
3. May minimise environmental impact			

Design Principles

Category	Number	Design principle
Safety (core)	FDP1	The airspace design and its operation must be as safe or safer than it is today.
Safety (core)	FDP2	Flight paths must be flyable and technically supported by air traffic control and airport technical management systems.
Operational (core)	FDP3	Flight paths must be designed to allow modern aircraft to use performance-based navigation (PBN) in line with CAA's modernisation strategy
Operational (core)	FDP4	Routes to/from Glasgow and Edinburgh airports must be procedurally deconflicted from the ground to a preferred level in coordination with NATS Prestwick.
Operational (core)	FDP5	The predictability of flight tracks must be maximised for consistency of operations.
Operational (core)	FDP6	Collaborate with other Scottish airports and NATS to ensure that the airspace design options are compatible with the wider programme of lower altitude and network airspace changes and accords with the CAA's published Airspace Modernisation Strategy (CAP 1711) and any current or future plans associated with it.

Design Principles

Health and wellbeing	FDP7	Flight paths should be designed to minimise the total adverse effect on health and quality of life created by aircraft noise and emissions.
Health and wellbeing	FDP8	For flightpaths at or above 4,000ft to below 7,000ft, the environmental priority should continue to be minimising the impact of aviation noise in a manner consistent with the government's overall policy on aviation noise, unless this would disproportionately increase CO_2 emissions.
Health and wellbeing	FDP9	Flight paths should be designed to minimise population overflown below 4,000ft and, between 4,000ft and 7,000ft, taking into account any potential adverse impact, due to those overflown having protected characteristics, as defined by the Equalities Act 2010.
Health and wellbeing	FDP10	Flight paths should be designed to minimise overflying sensitive locations and noise-sensitive receptors (for example, the zoo, retirement complexes, green spaces, historic heritage sites, and others).
Health and wellbeing	FDP11	Flight paths should be designed to include track concentration and/or track dispersal options to provide noise respite.
Operational	FDP12	Flight paths should be designed with routes that minimise track miles and fuel burn.
Operational	FDP13	Flight paths should be designed to ensure efficient and effective route management.
Technical	FDP14	Requirements of airspace users should be taken into account when designing flight paths.
Environment	FDP15	Flight paths should be designed to minimise adverse local air quality impacts.
Economy	FDP16	Airspace should be designed to maximise capacity in order to contribute economic benefits to Scotland, including tourism and trade.

The (current) system

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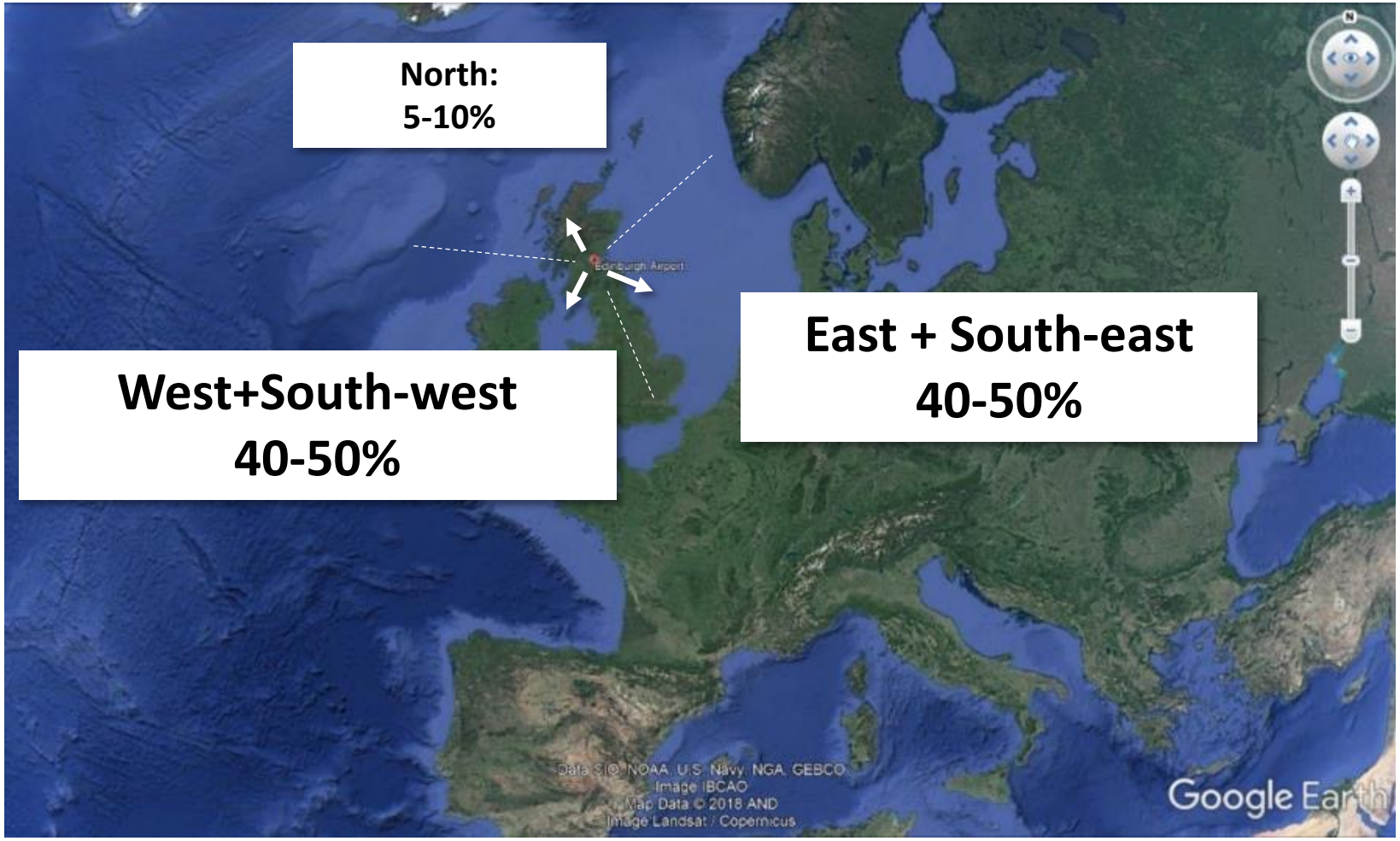
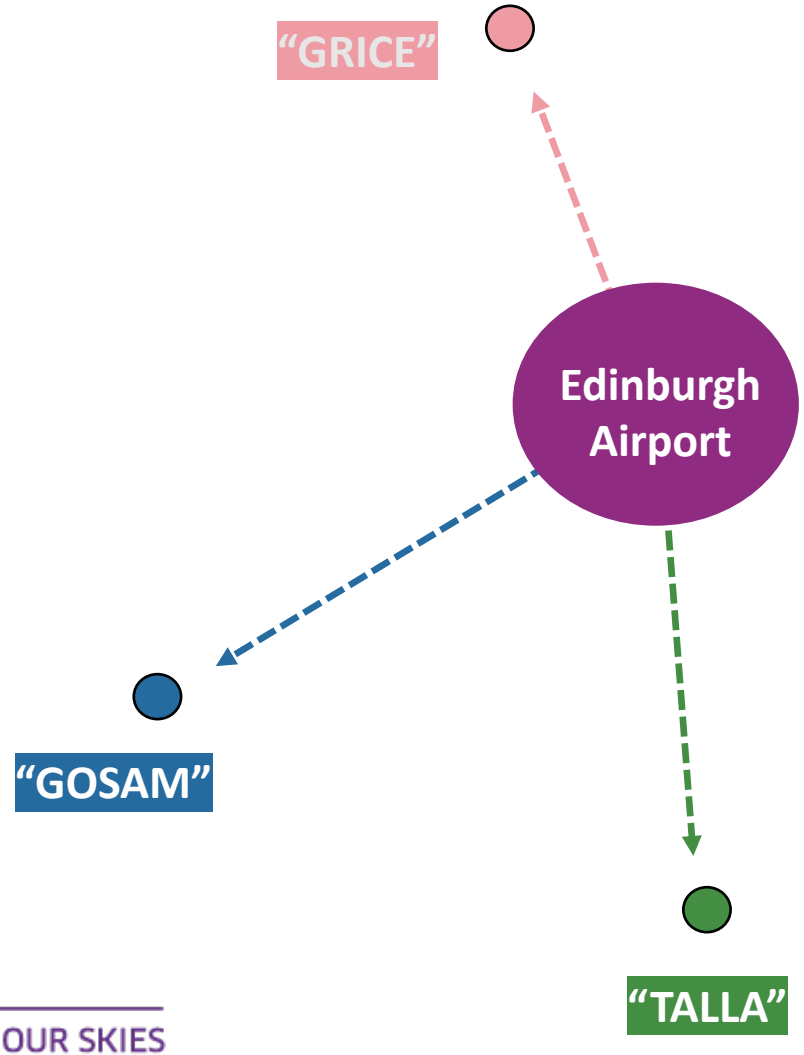
The system / destinations



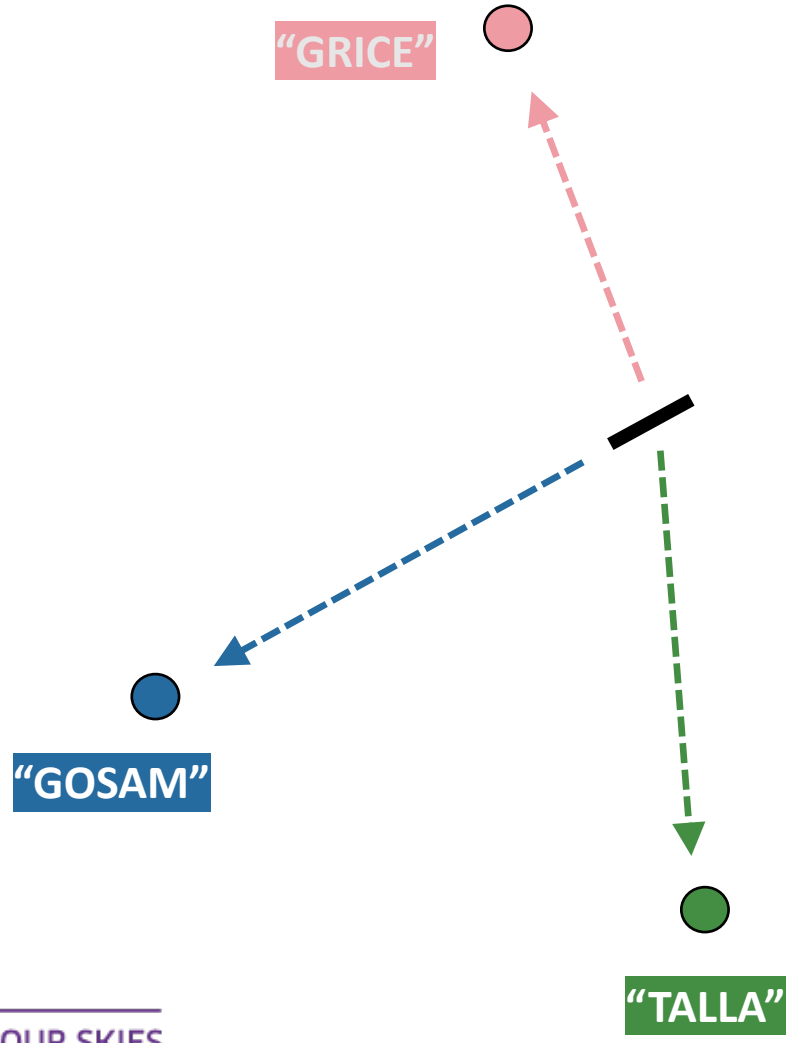
The system / (Departure) route exit points

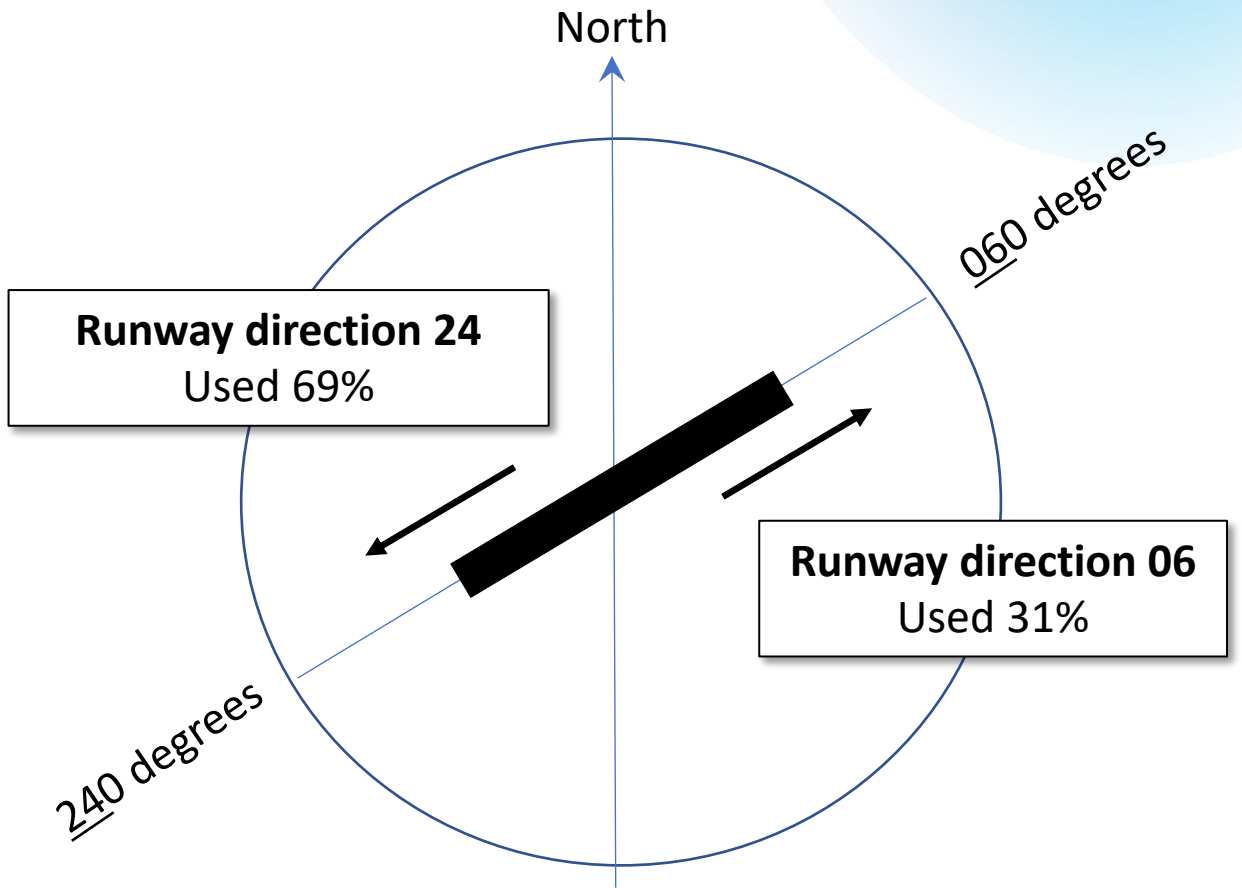


Route exit points:

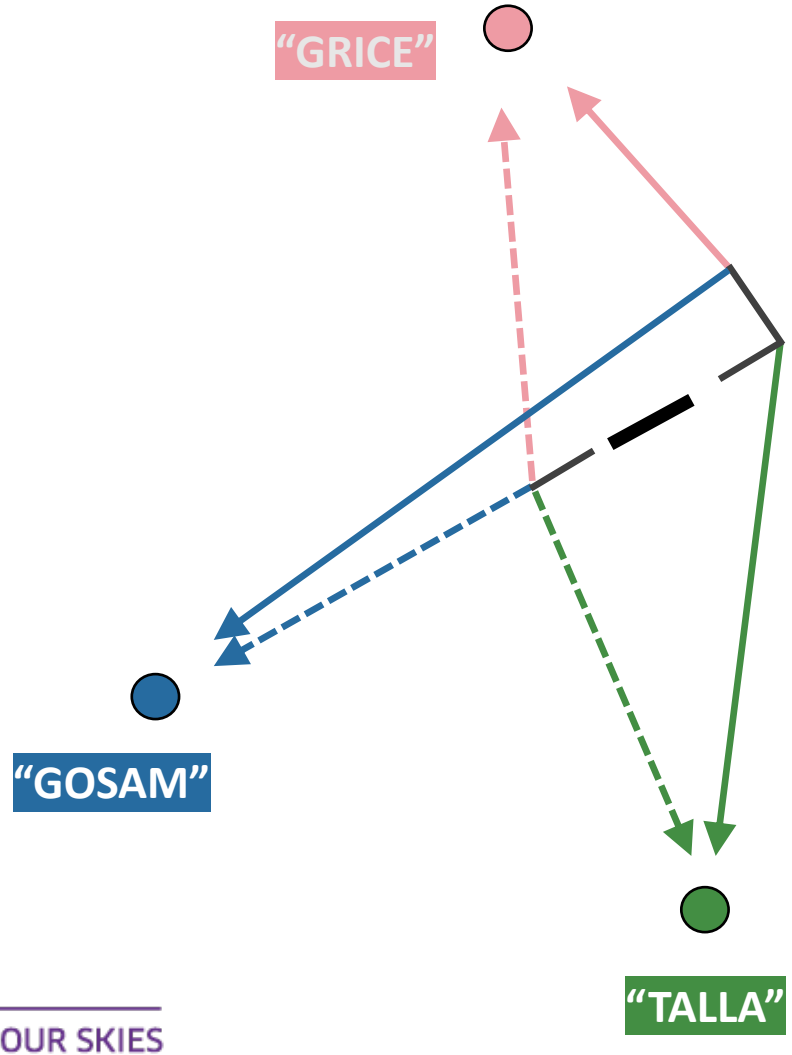
1) GOSAM
2) GRICE
3) TALLA

The system / Runway usage



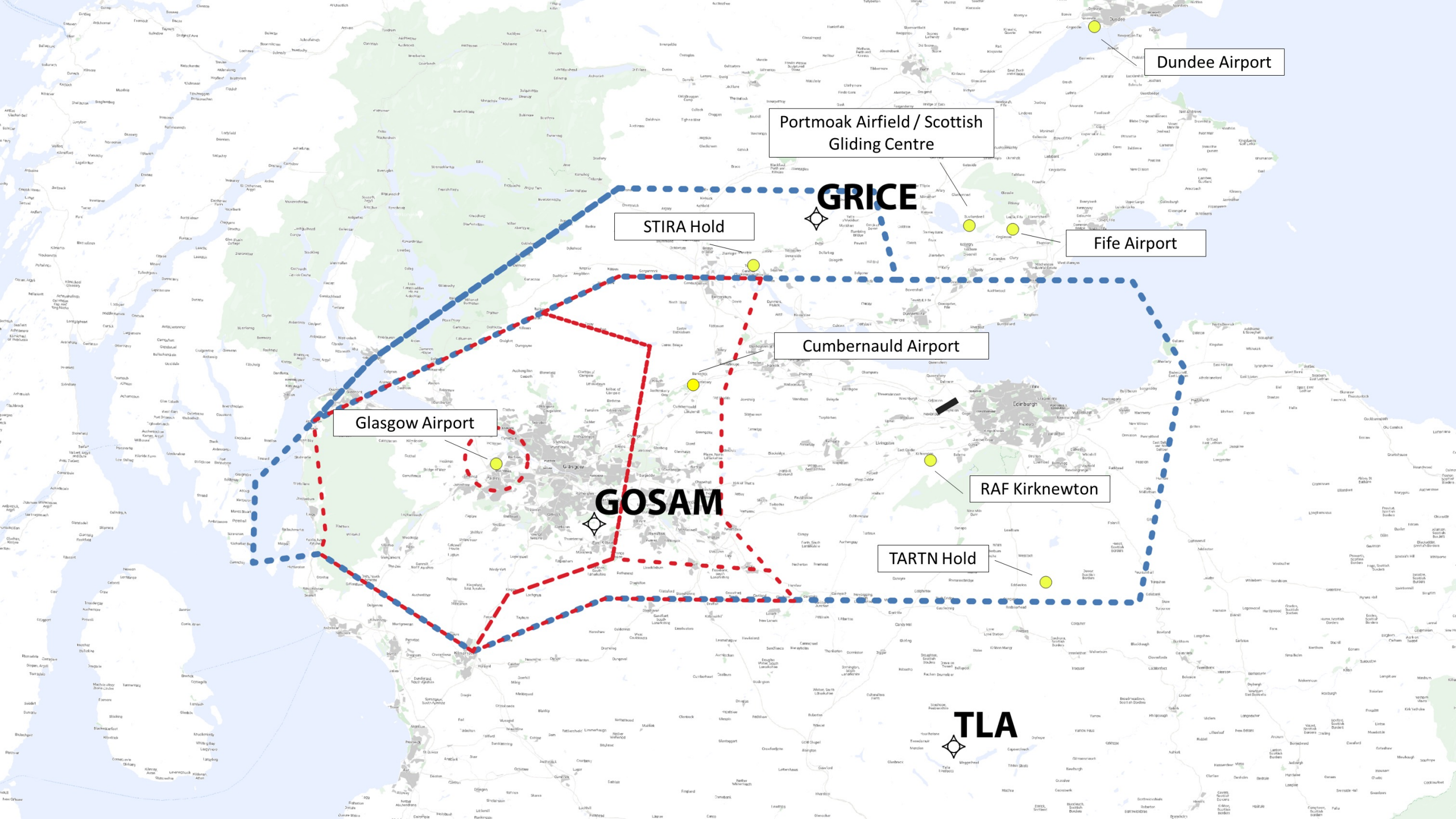


The system / route system

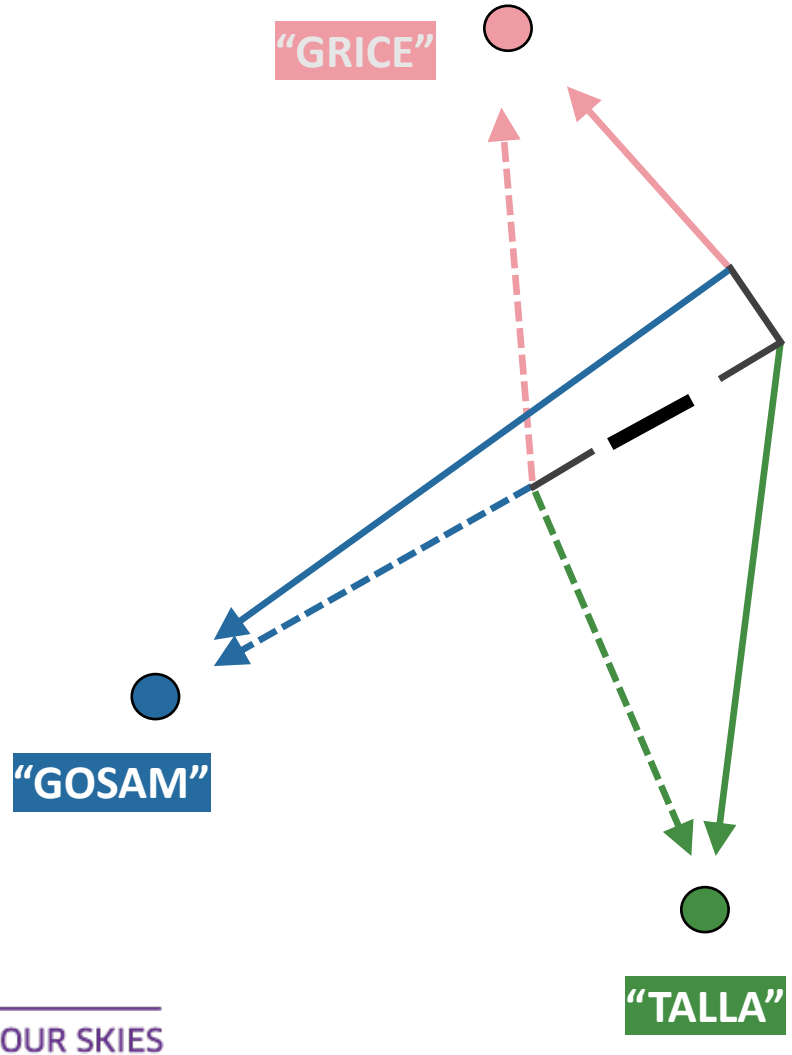


There are departure routes from each runway direction (2) to each runway exit point (3)

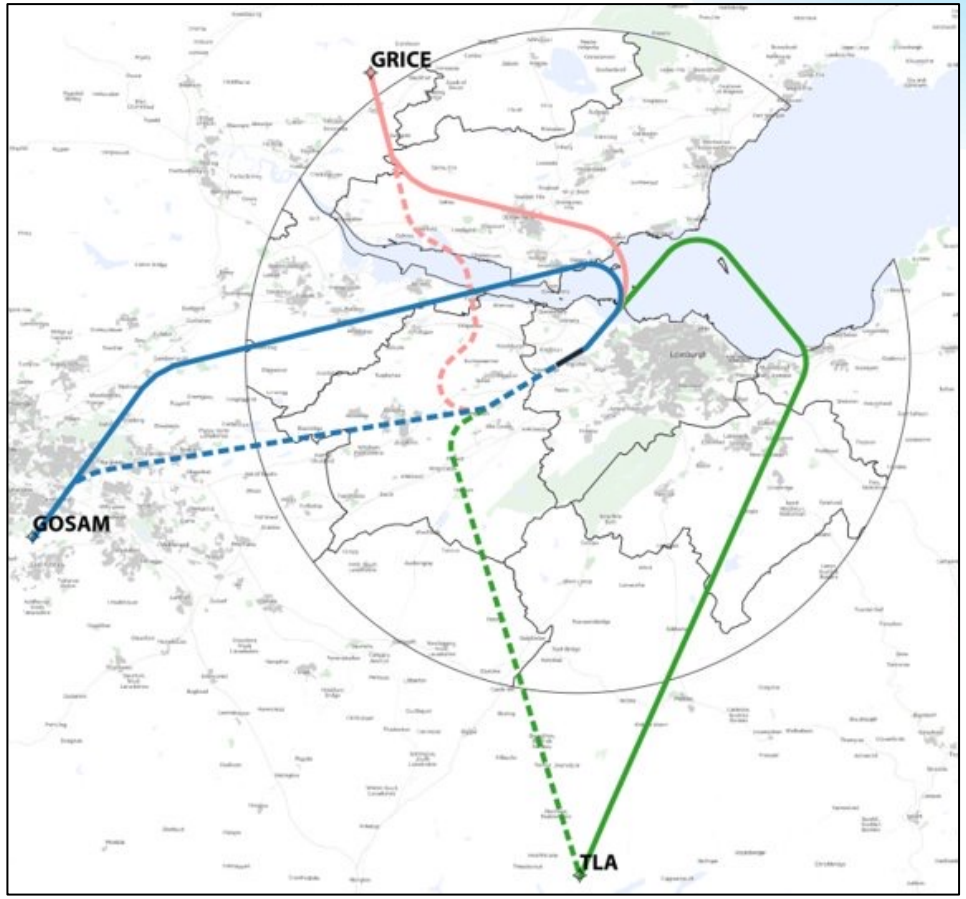
1. 06 → GOSAM
2. 06 → TALLA
3. 06 → GRICE
4. 24 → GOSAM
5. 24 → TALLA
6. 24 → GRICE


Dundee Airport
Portmoak Airfield / Scottish Gliding Centre
GRICE
STIRA Hold
Fife Airport
Cumbernauld Airport
Glasgow Airport
GOSAM
RAF Kirknewton
TARTN Hold
TLA

The system / route system DP 1,2,4,5

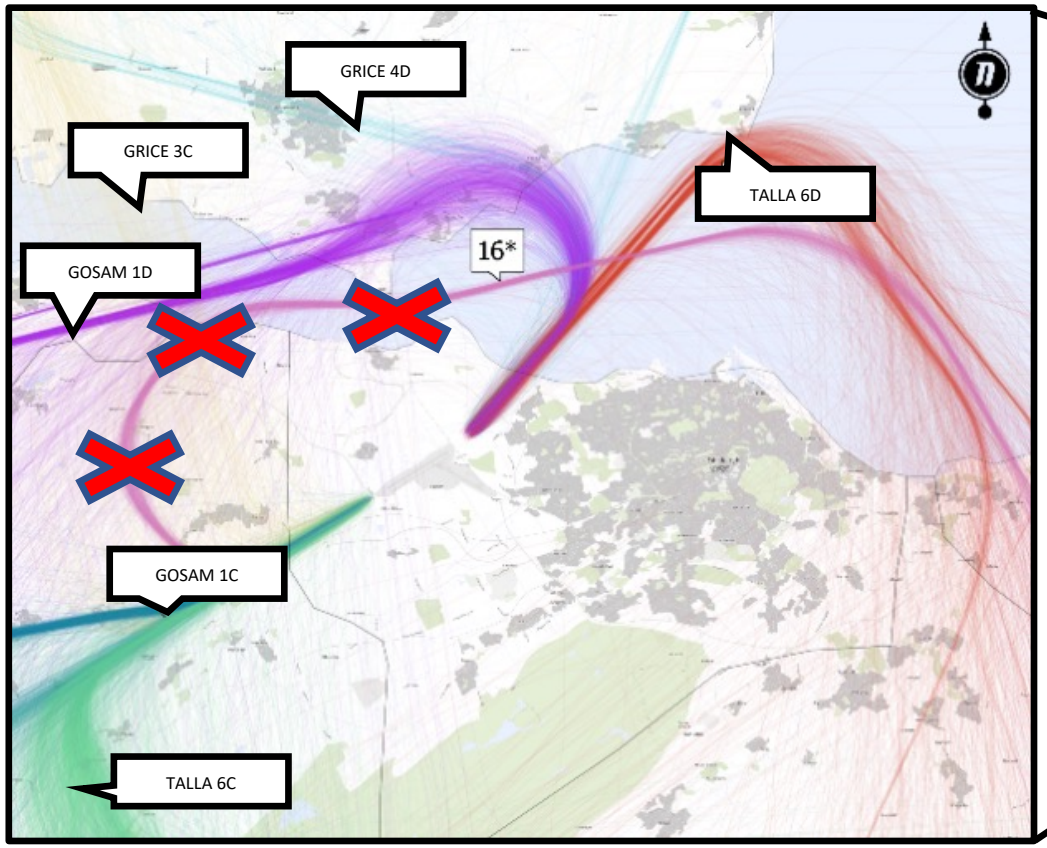


Current published departure routes

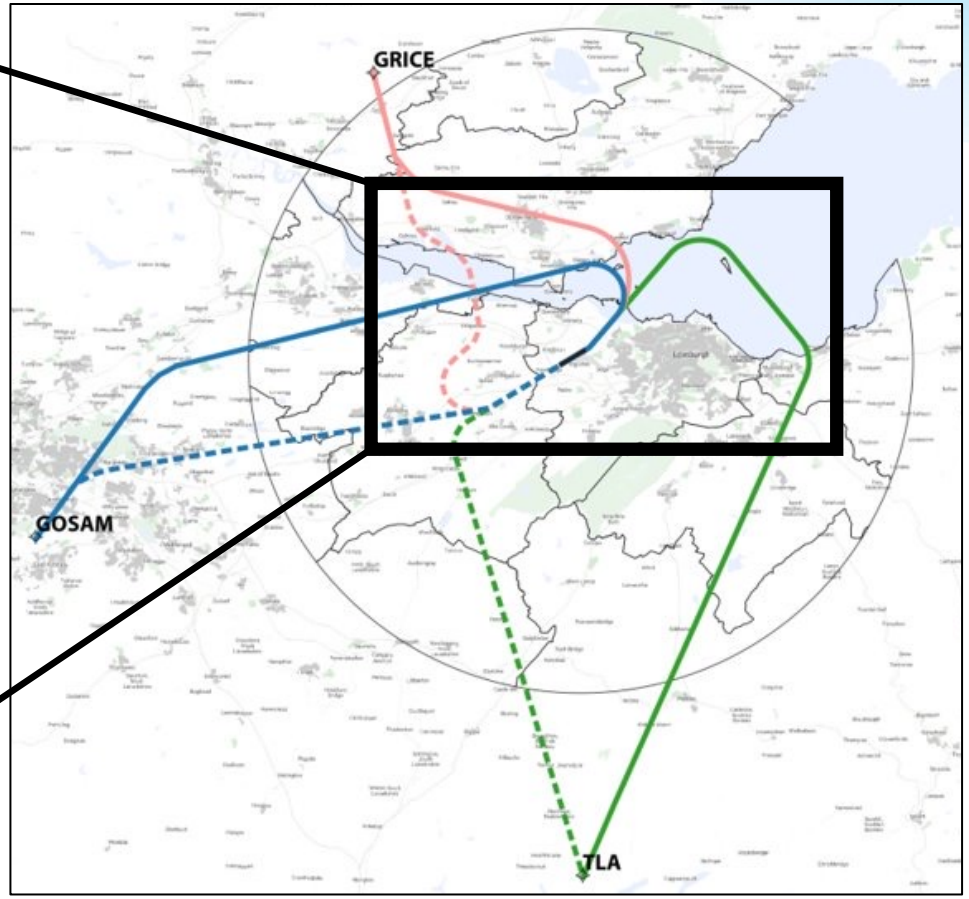


The system / route system

Actual departure tracks

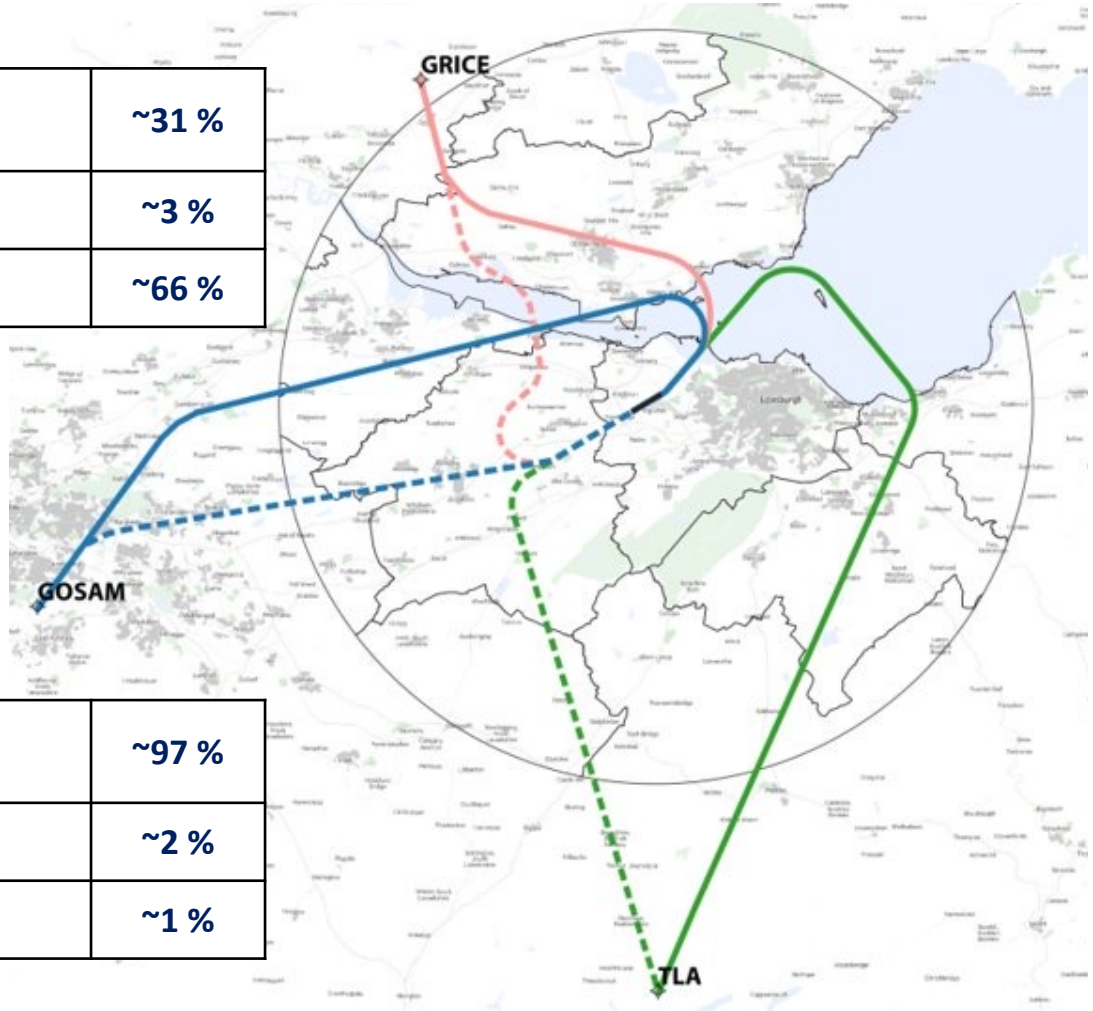


Current published departure routes



Speed categories per departure route

GRICE 7%		
	Fast jet	~31 %
	Semi-fast.	~3 %
	Slow	~66 %

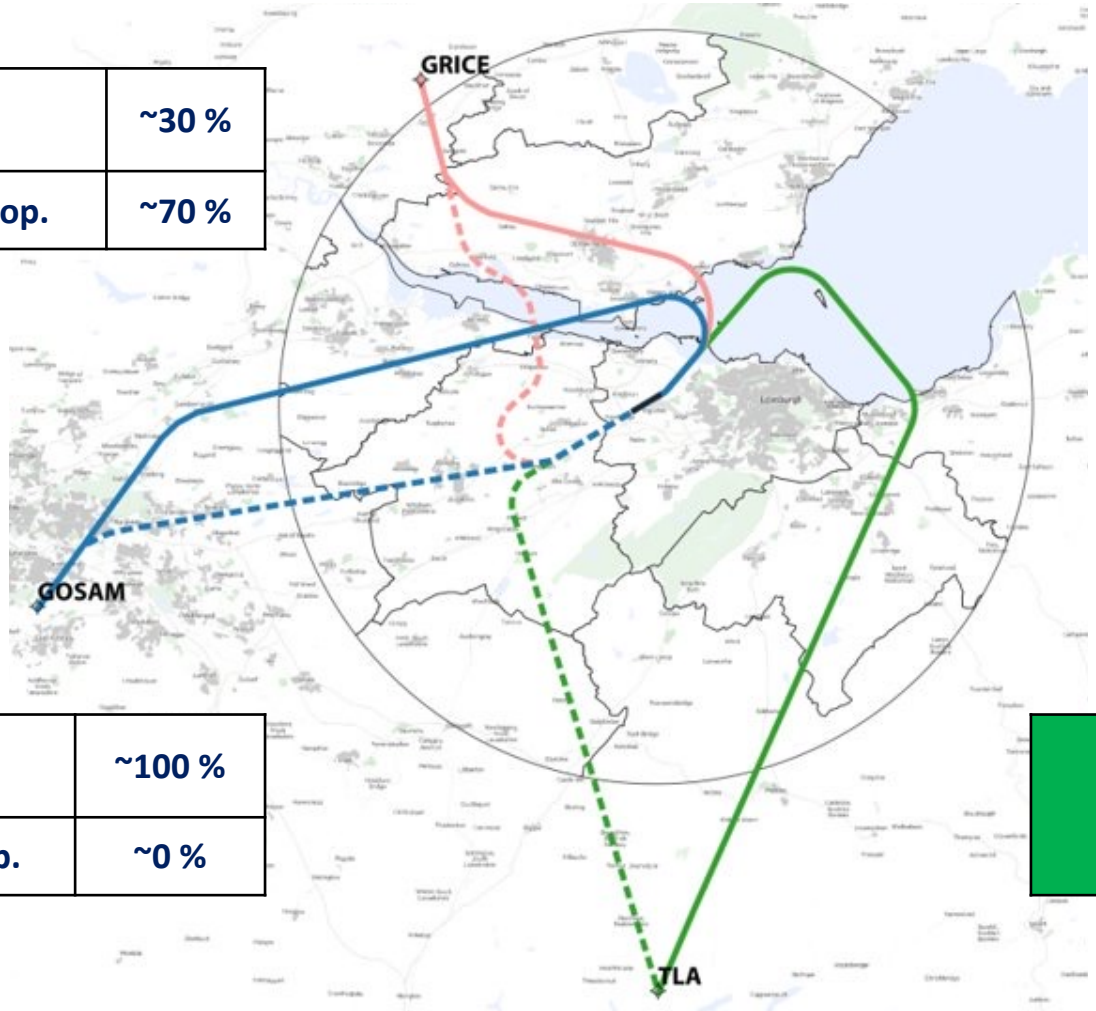


GOSAM 43%		
	Fast jet	~97 %
	Semi-fast	~2 %
	Slow	~1 %

TALLA 50%		
	Fast jet	~52 %
	Semi-fast	~36 %
	Slow	~11 %

Propulsion-type per departure route

GRICE 7%	Jet	~30 %
	Turbo-prop.	~70 %



GOSAM 43%	Jet	~100 %
	Turbo-prop.	~0 %

TALLA 50%	Jet	~50 %
	Turbo-prop.	~50 %

Optioneering of routes

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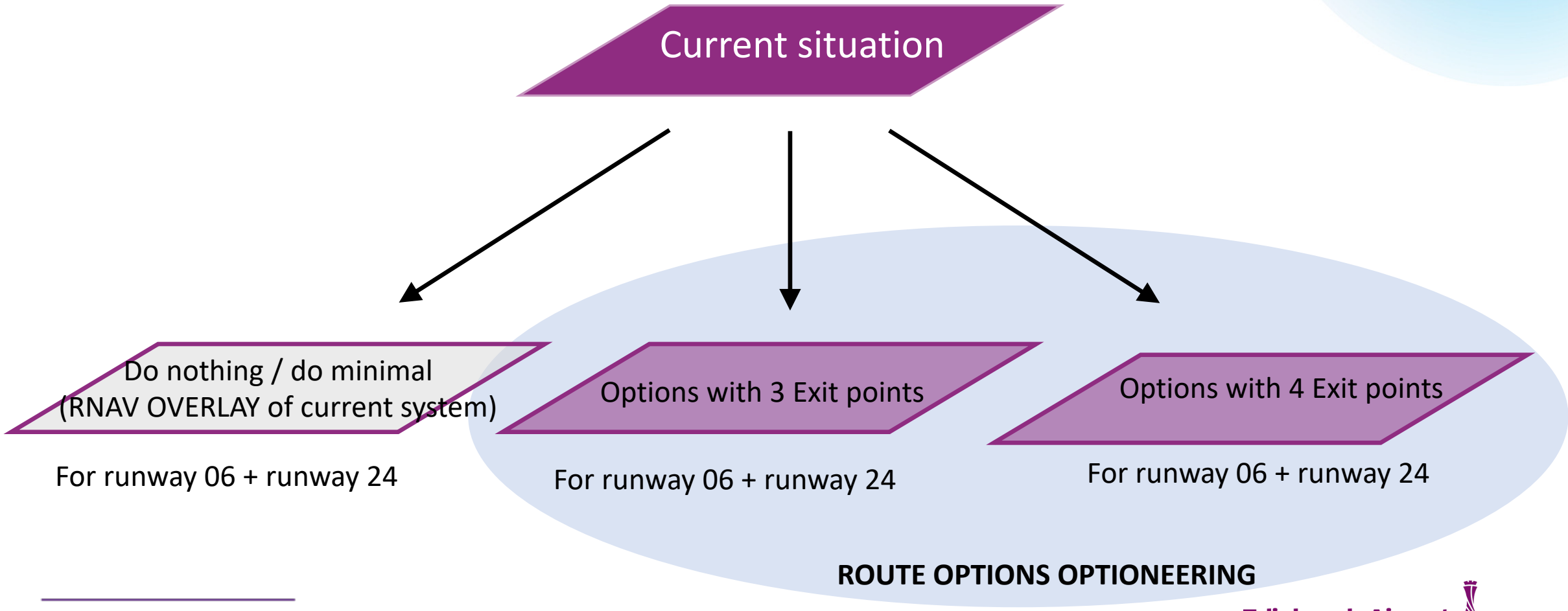
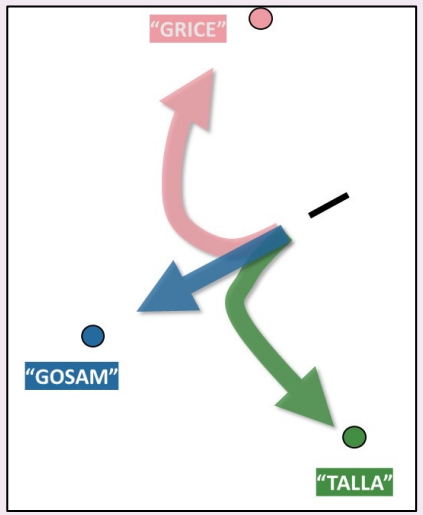
Route options under consideration



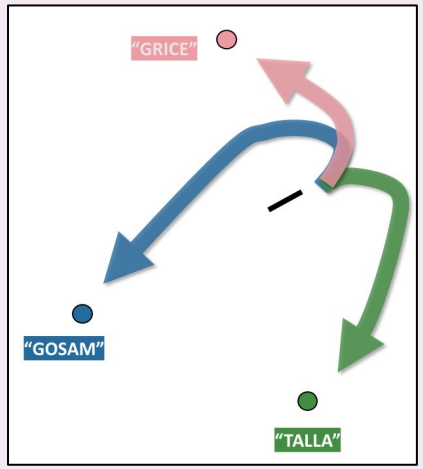
Departure route direction options with 3 exits points

Runway 24

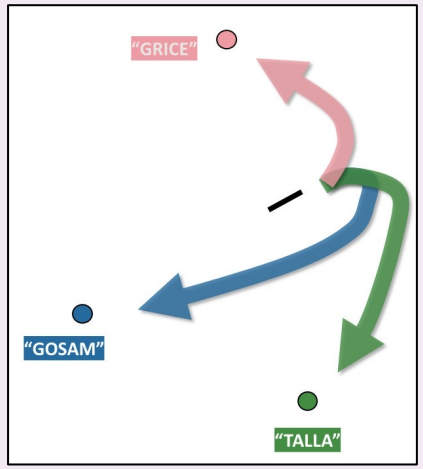


AND

Runway 06

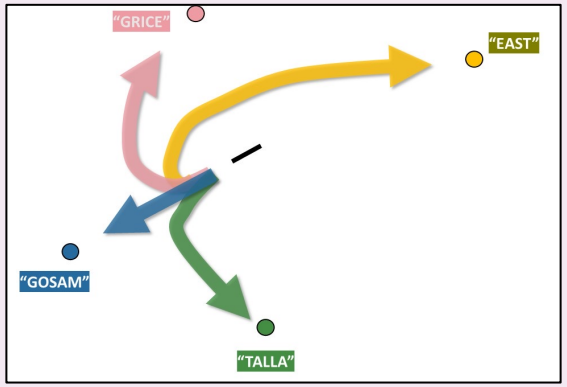


OR



Departure route direction options with 4 exits points

Runway 24



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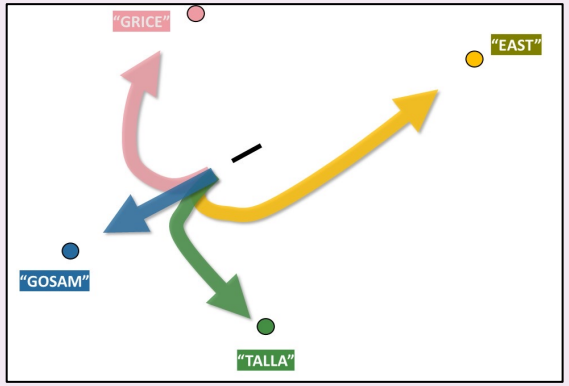
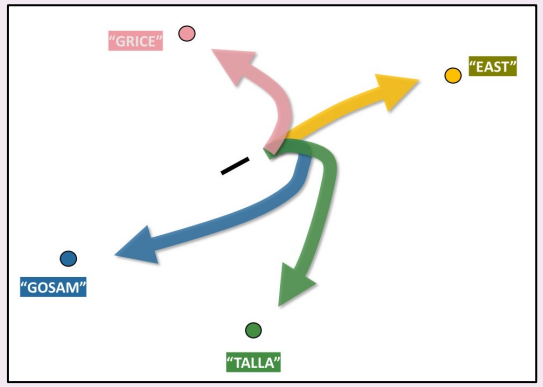


AND

Runway 06



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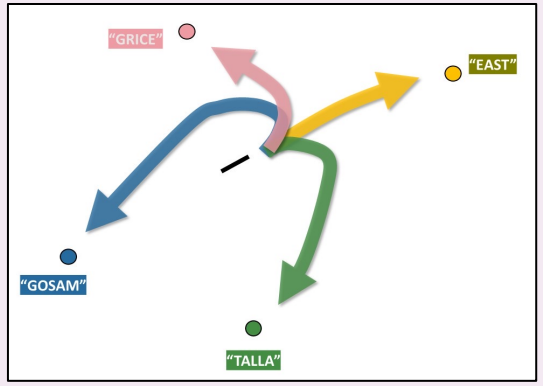

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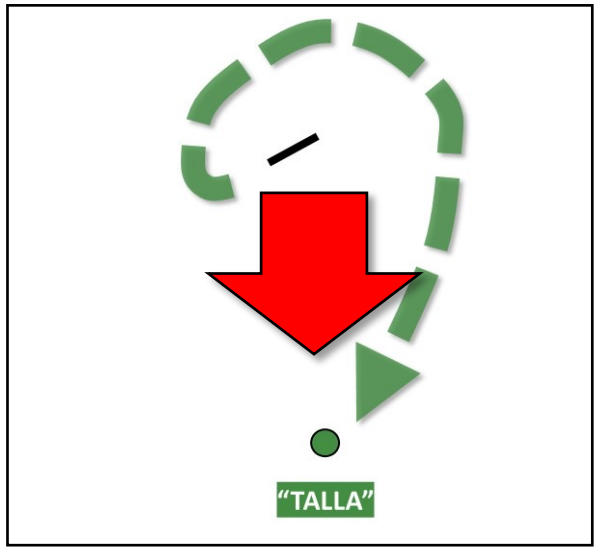
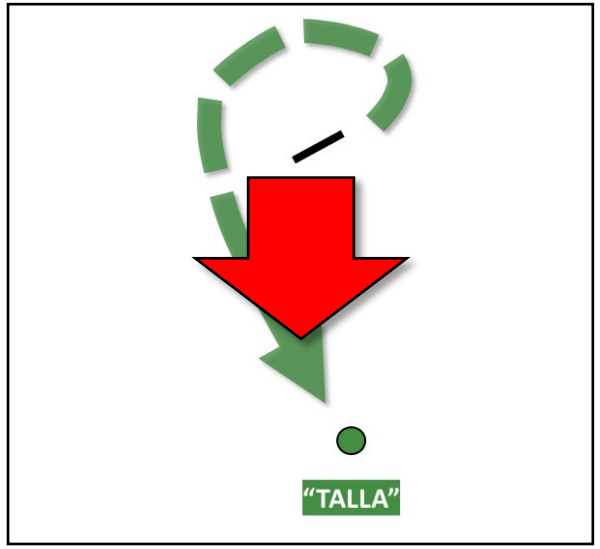
Route direction options considered, but ranked low

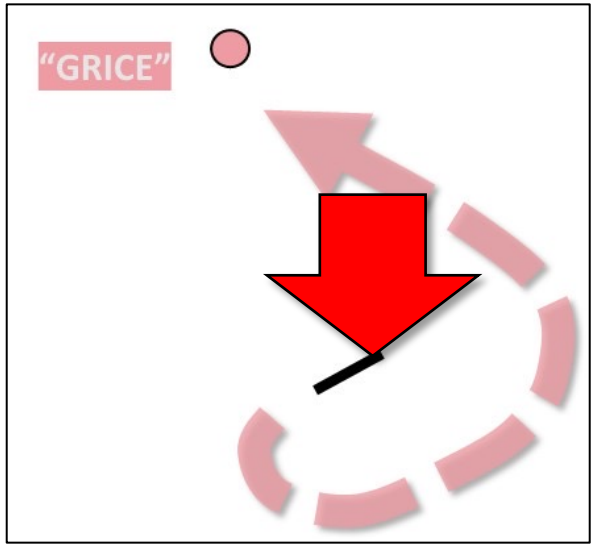
Runway 24



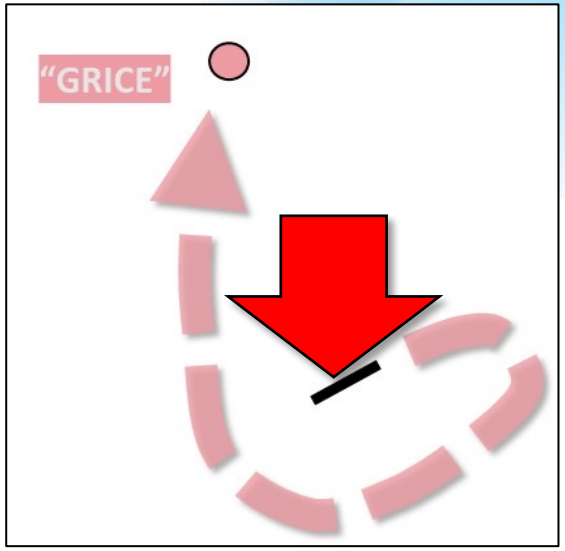
Runway 06



Runway 24



Runway 06

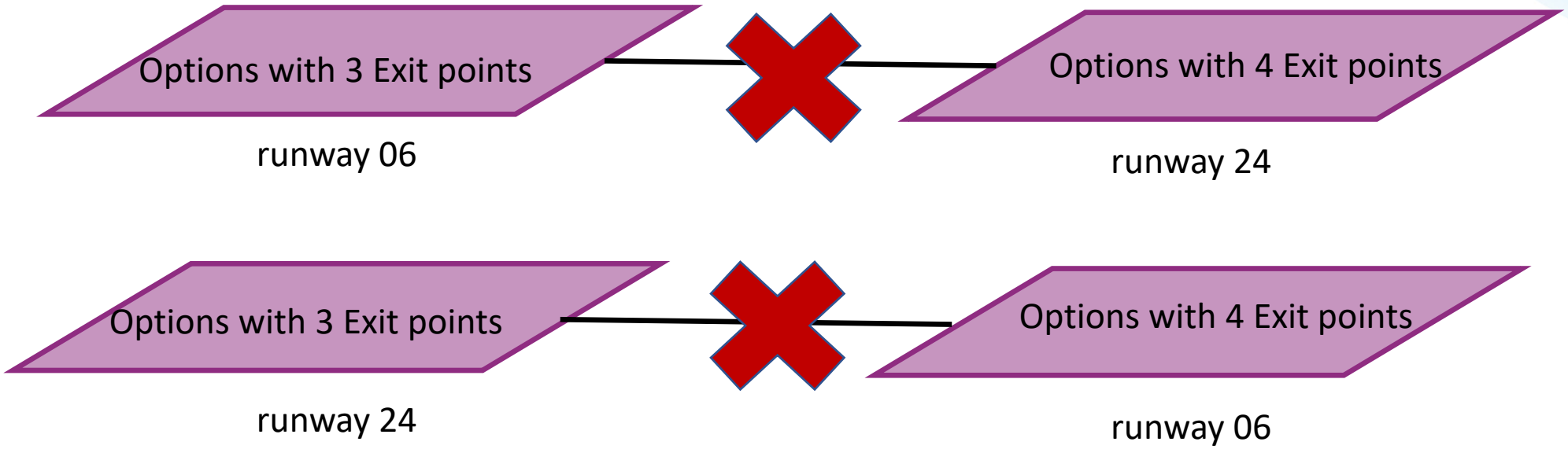


Motivation

- Route much longer than necessary (fuel, CO2)
- Consumes airspace
- Yet, no benefits have been identified

Combinations considered, but dropped

- Different number of routes for each runway directions



- Capacity not in balance (depend on runway direction / wind)
- Complicates system

Swathes

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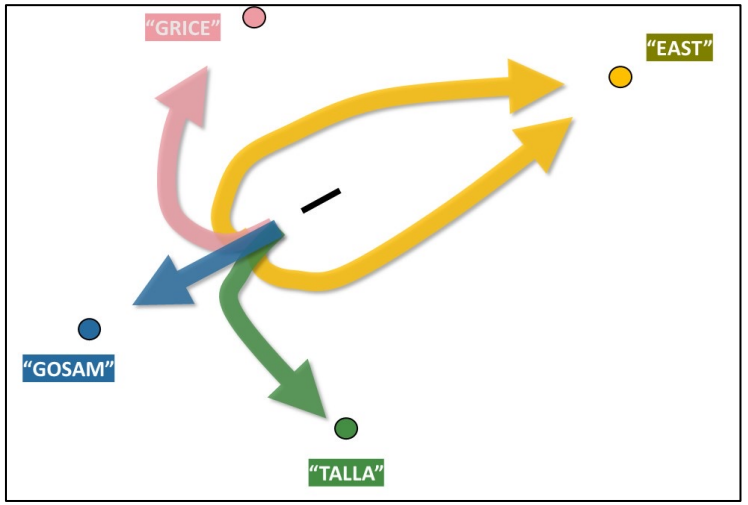
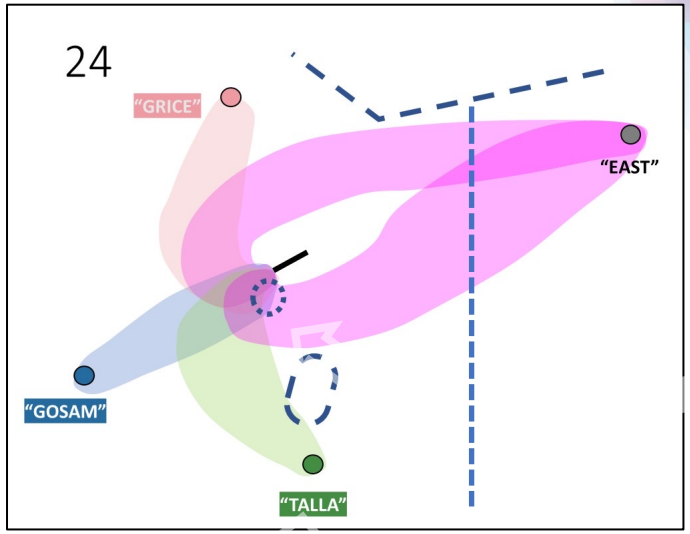
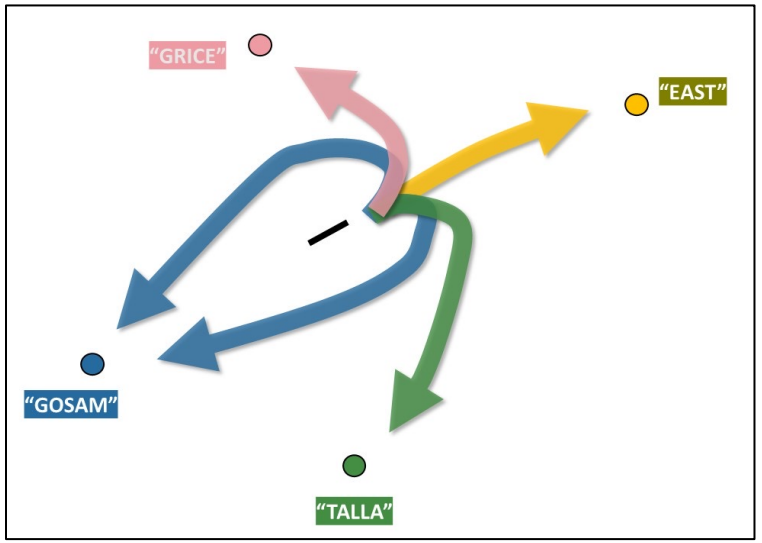
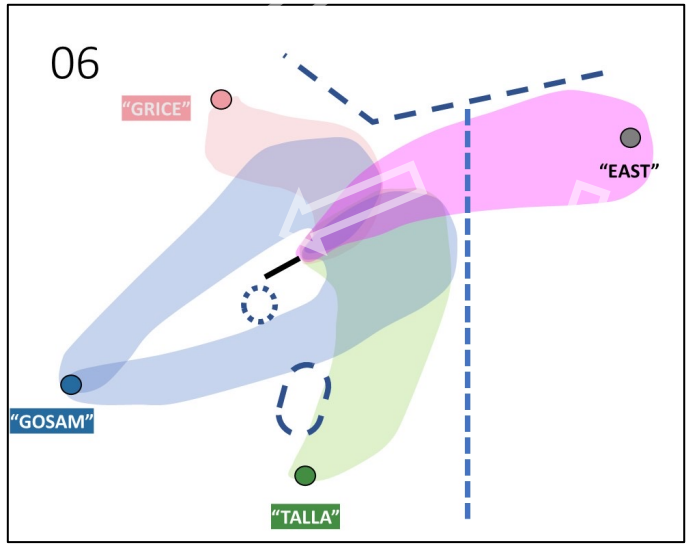
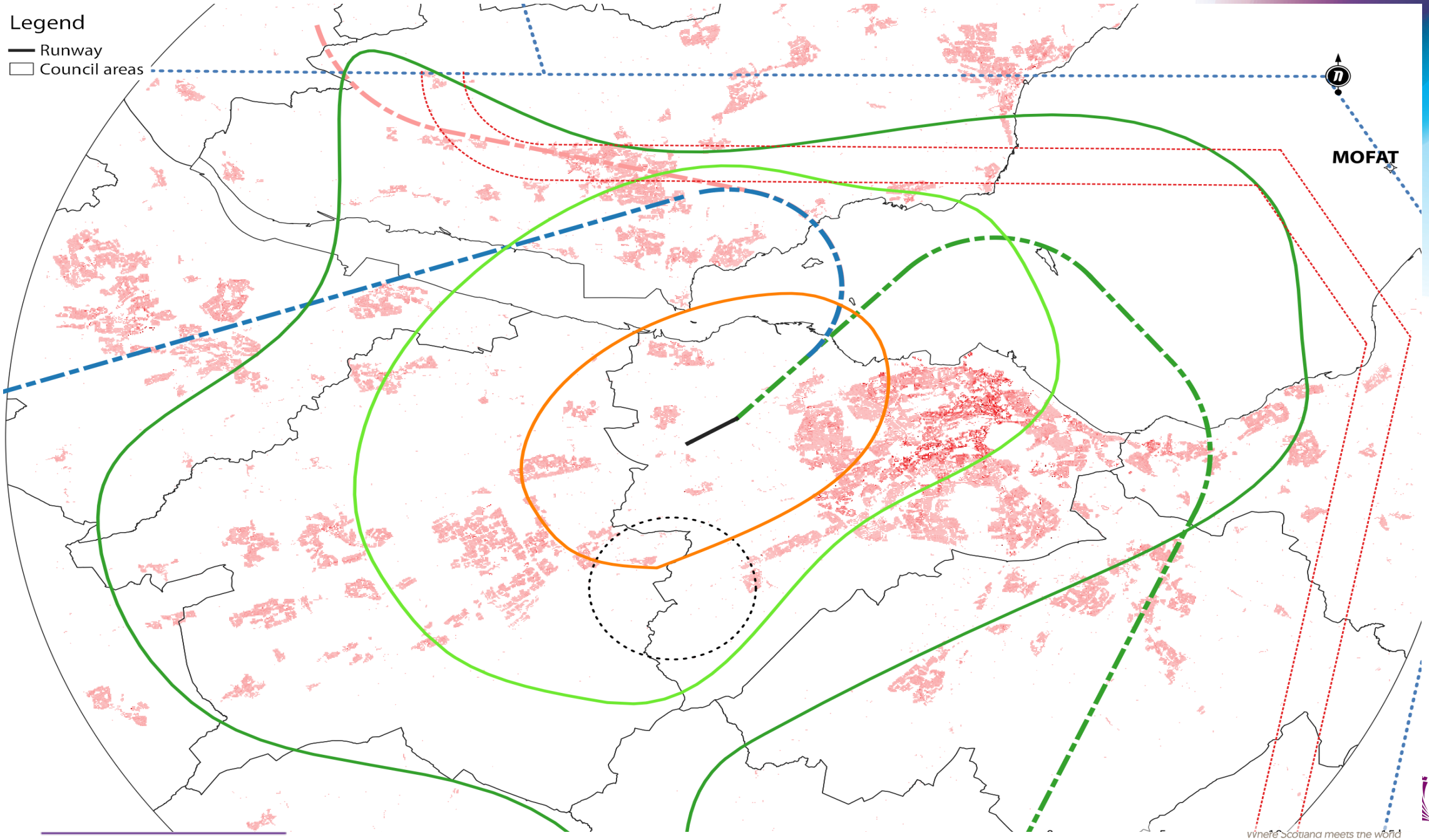
From route directions to swathes

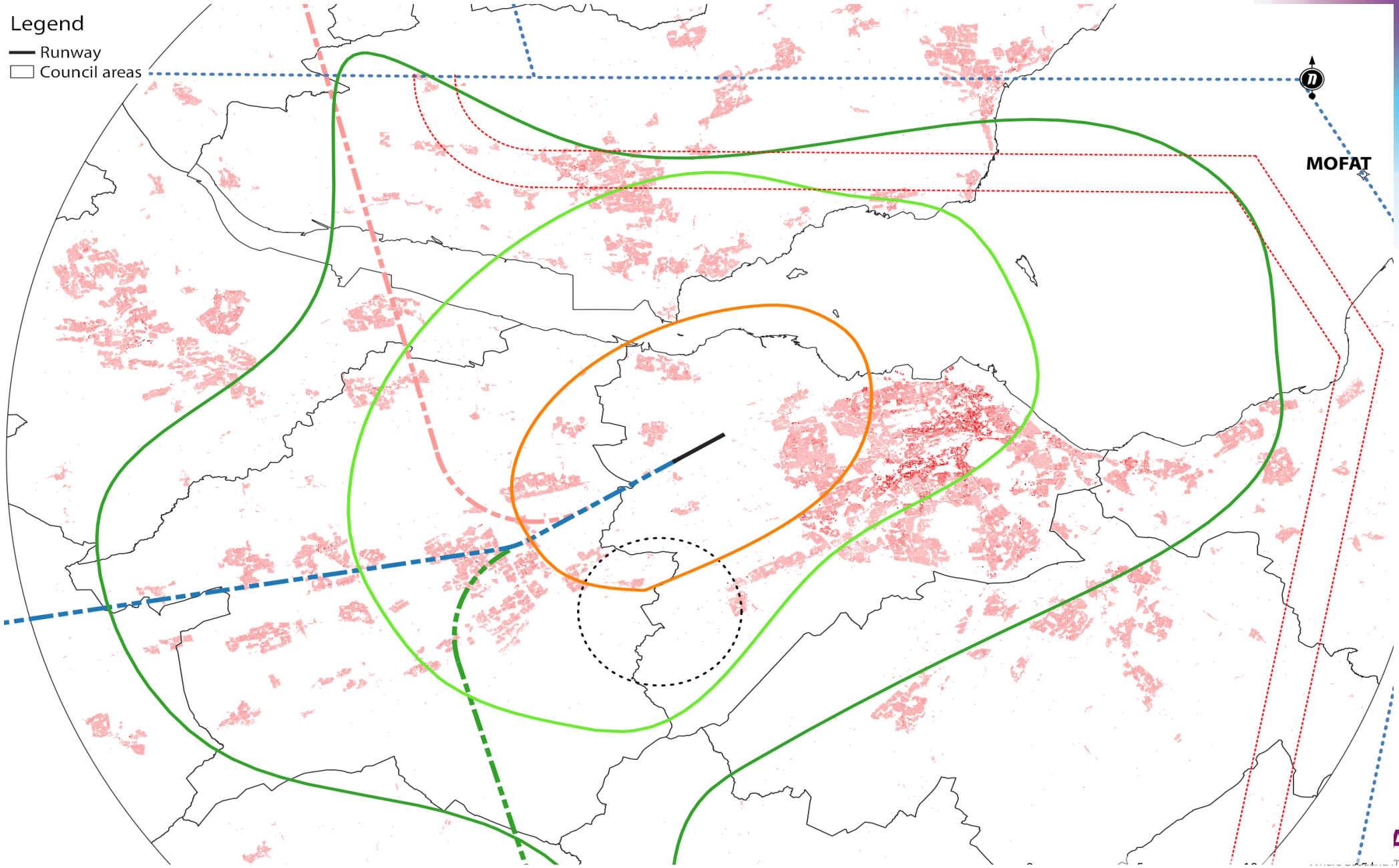




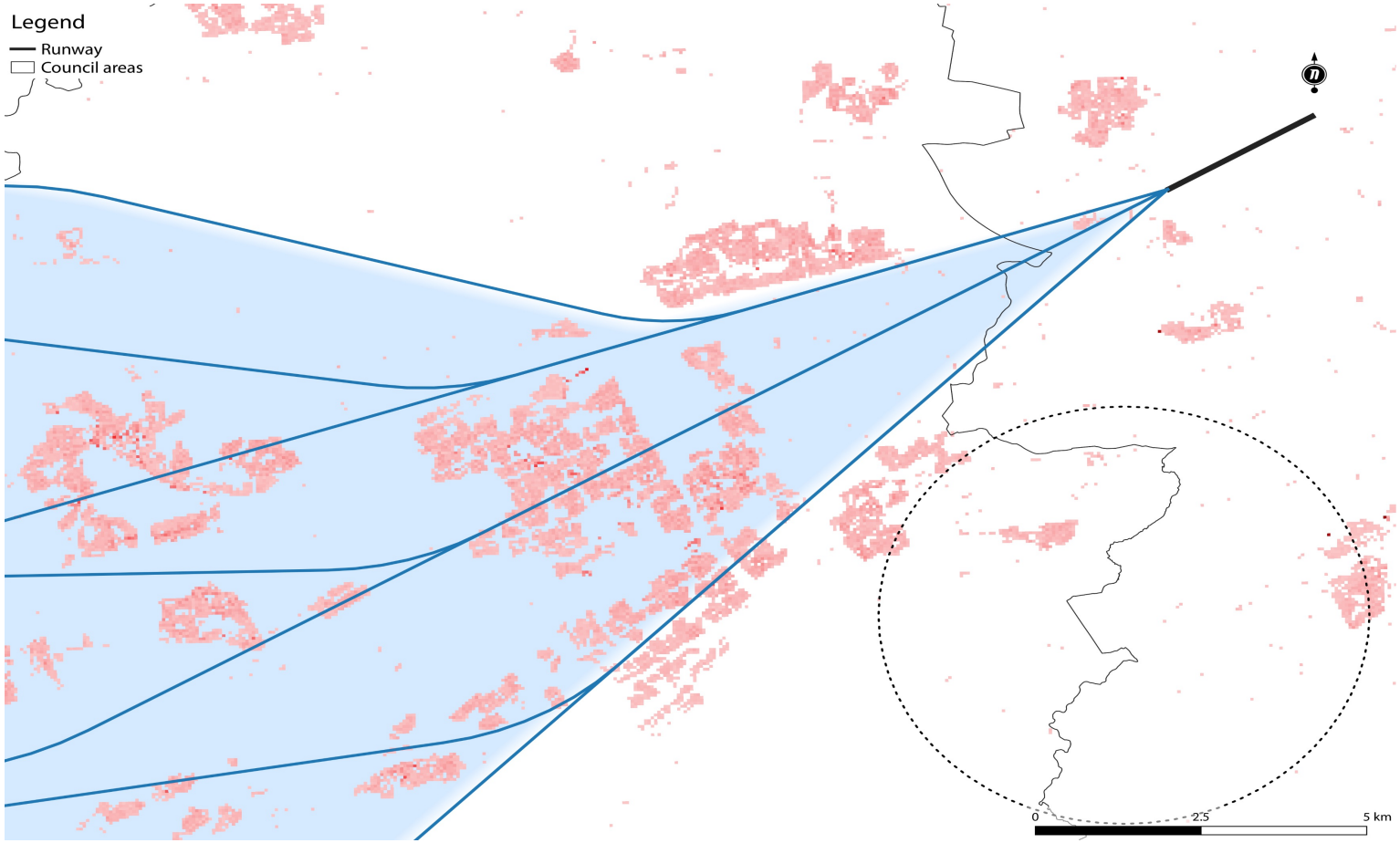




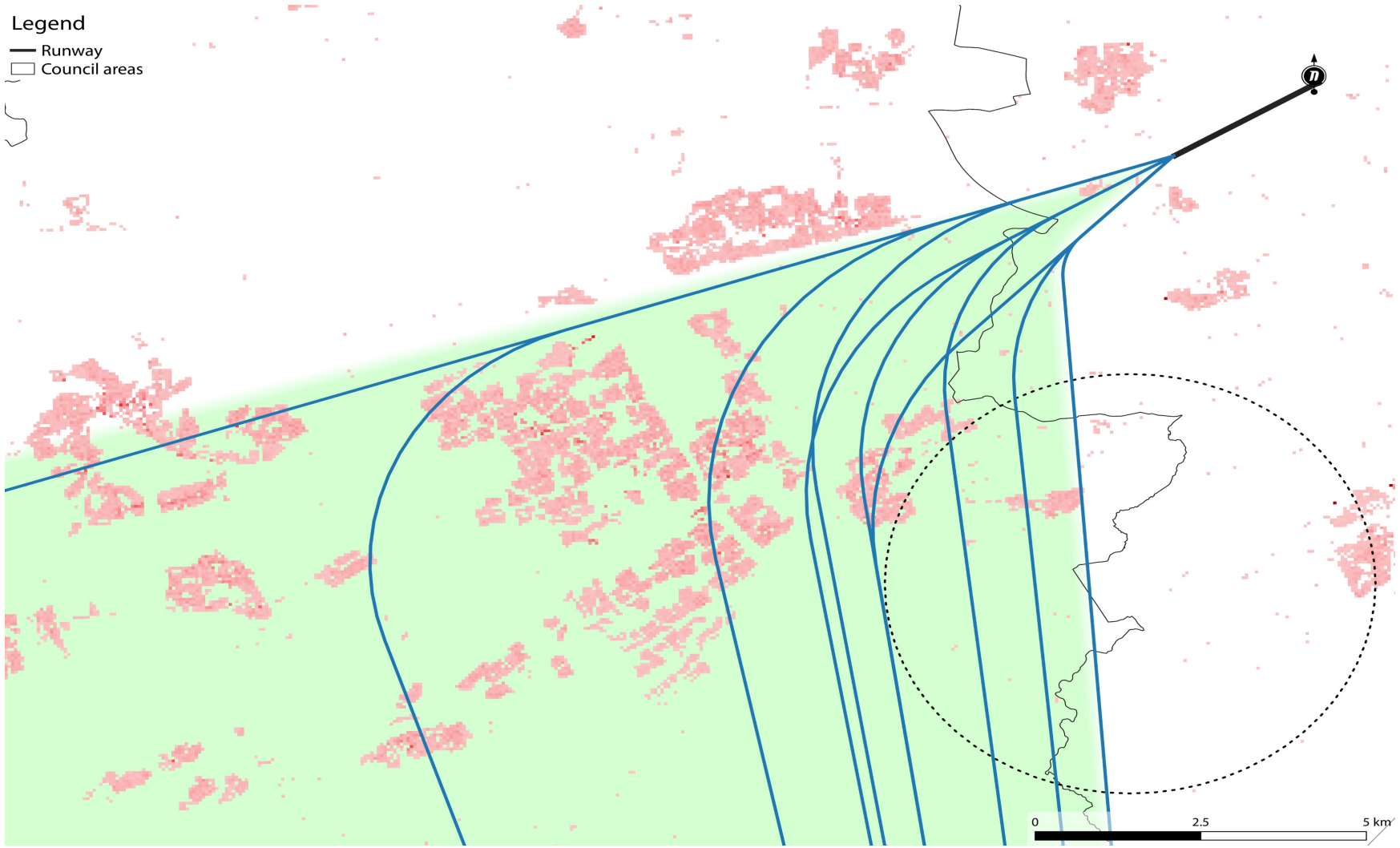

Legend
Runway
Council areas
MOFAT


Legend
Runway
Council areas
MOFAT

Draft swathe runway 24 to GOSAM



Draft swathe runway 24 to TALLA



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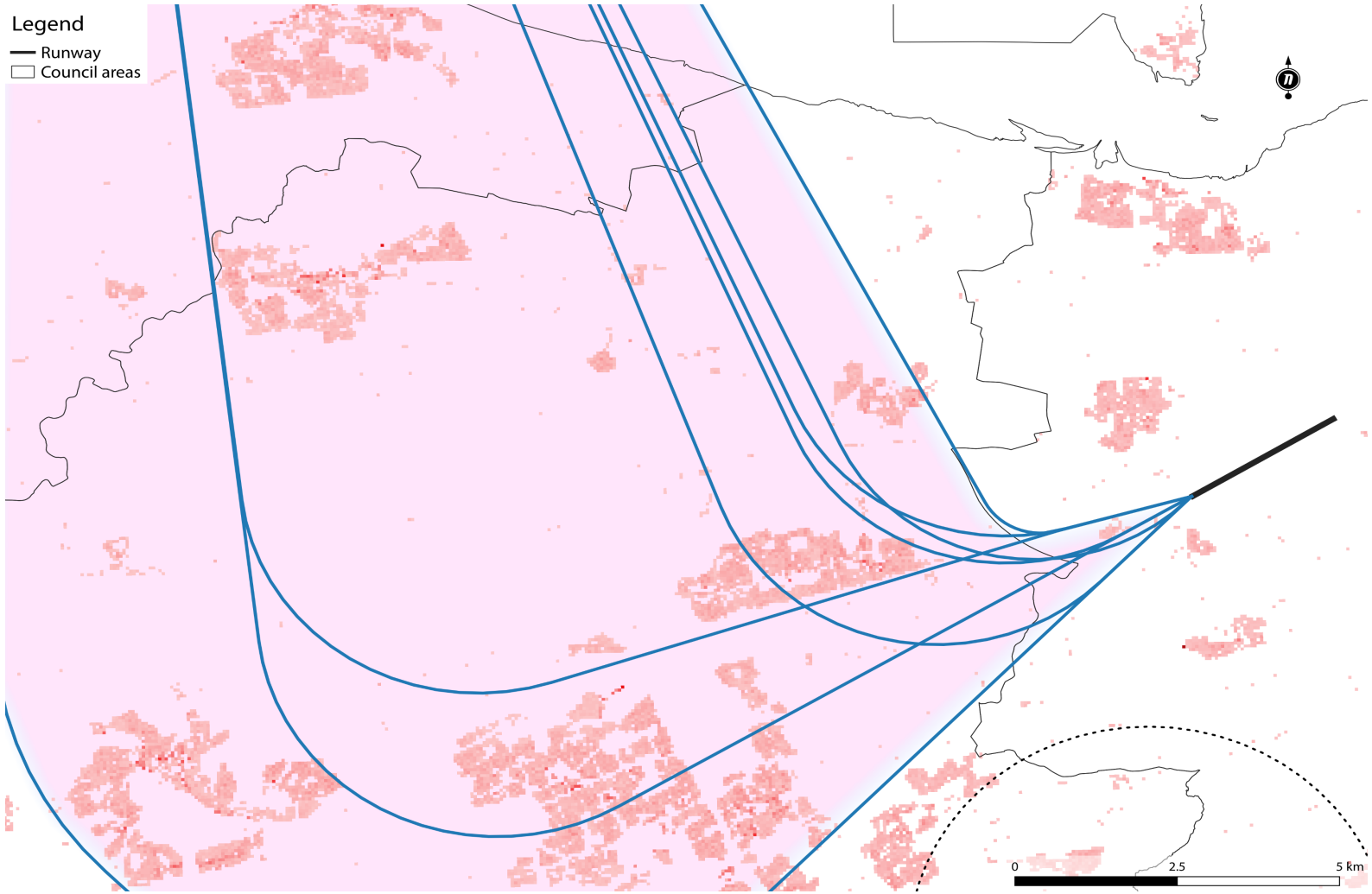
Draft swathe runway 24 to GRICE



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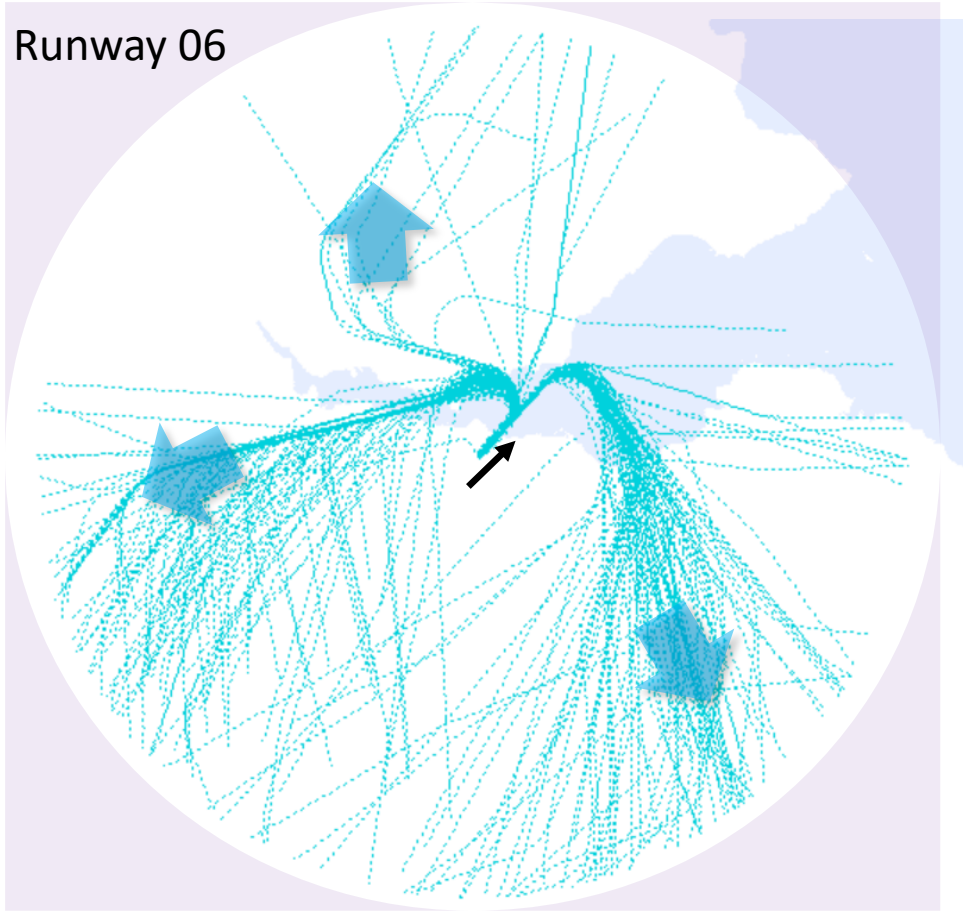
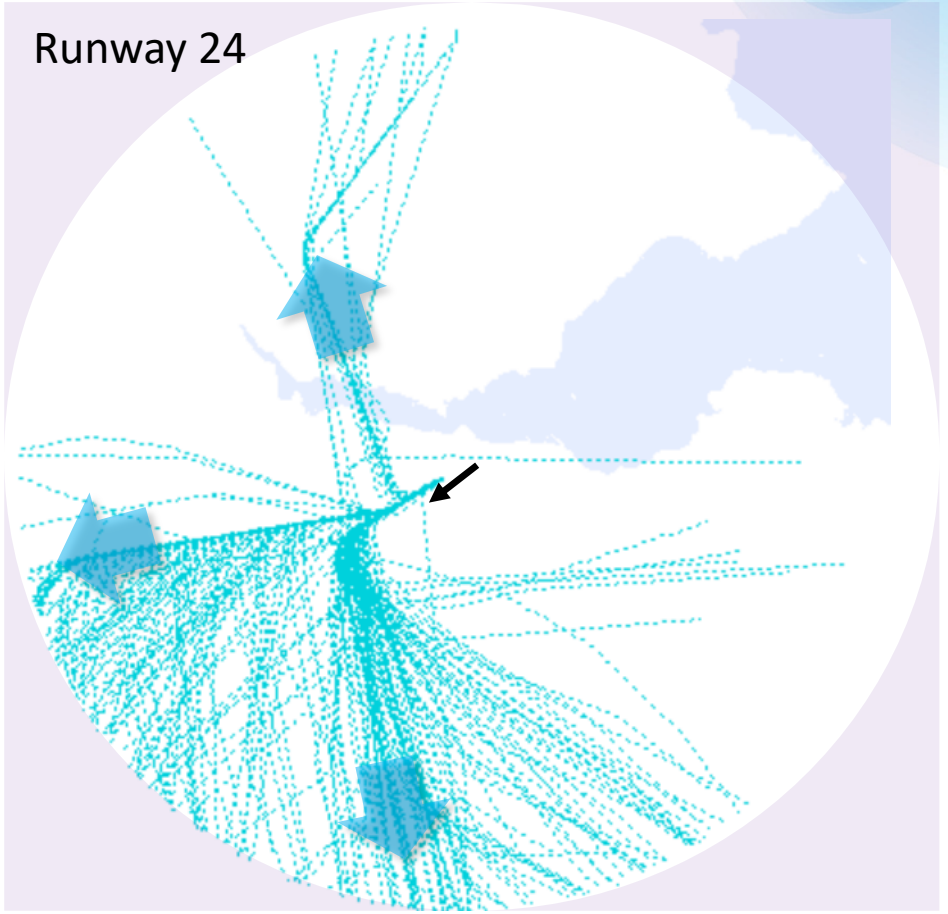
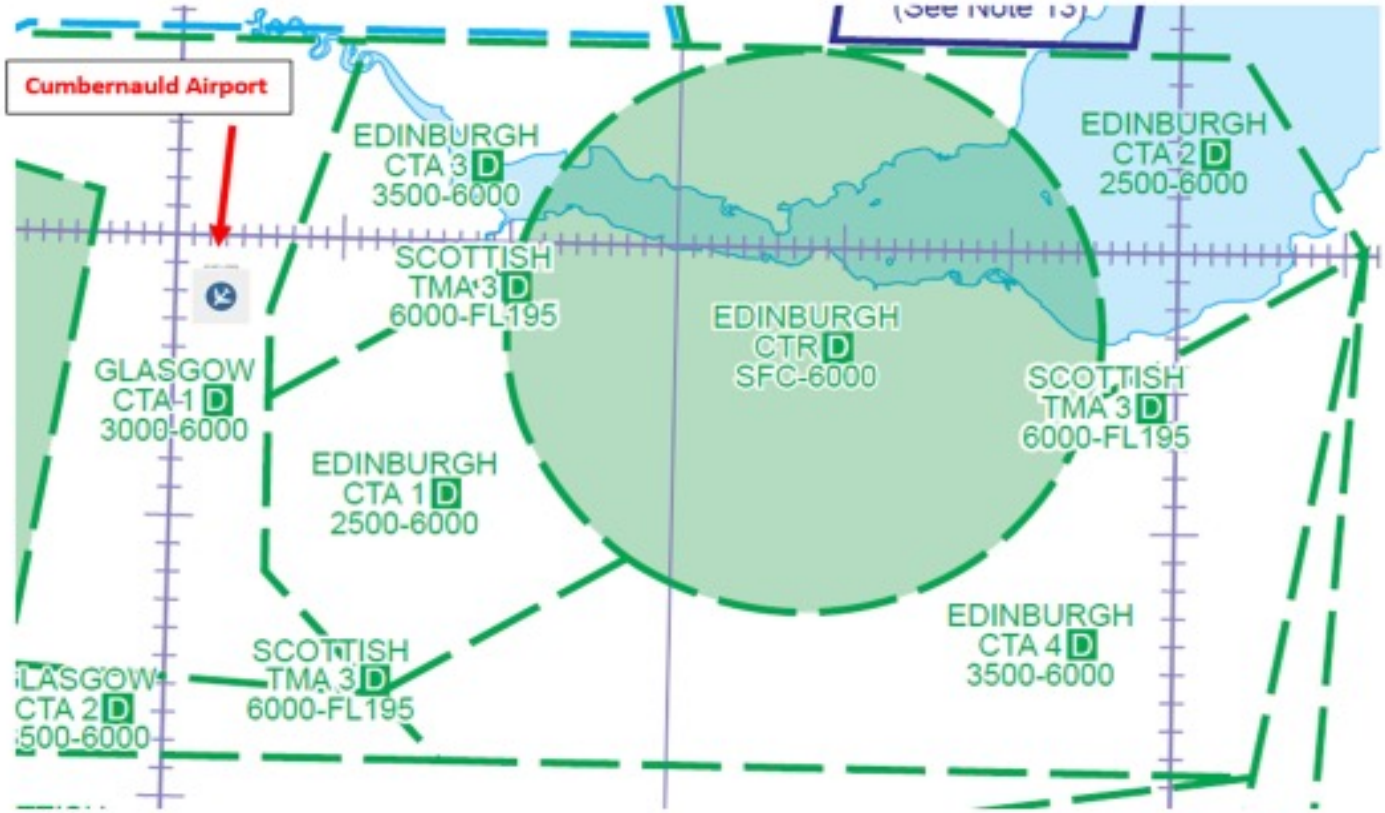
Actual tracks: Departures





Responses related to Edinburgh Airspace

DP 14



Summary – The responses on Edinburgh controlled airspace highlight the following:

- Existing controlled airspace currently structured around a closed Runway (RWY 12/30).
- Edinburgh airspace is excessive when compared with other UK airports.
- Areas to the North and South of Edinburgh reportedly underused.

The responses on Edinburgh controlled airspace have requested that the Edinburgh CTA base levels to be raised, particularly Edinburgh CTAs 2, 3 & 4. The focus being on removing airspace associated with Runway 12/30.

Arrivals & approaches

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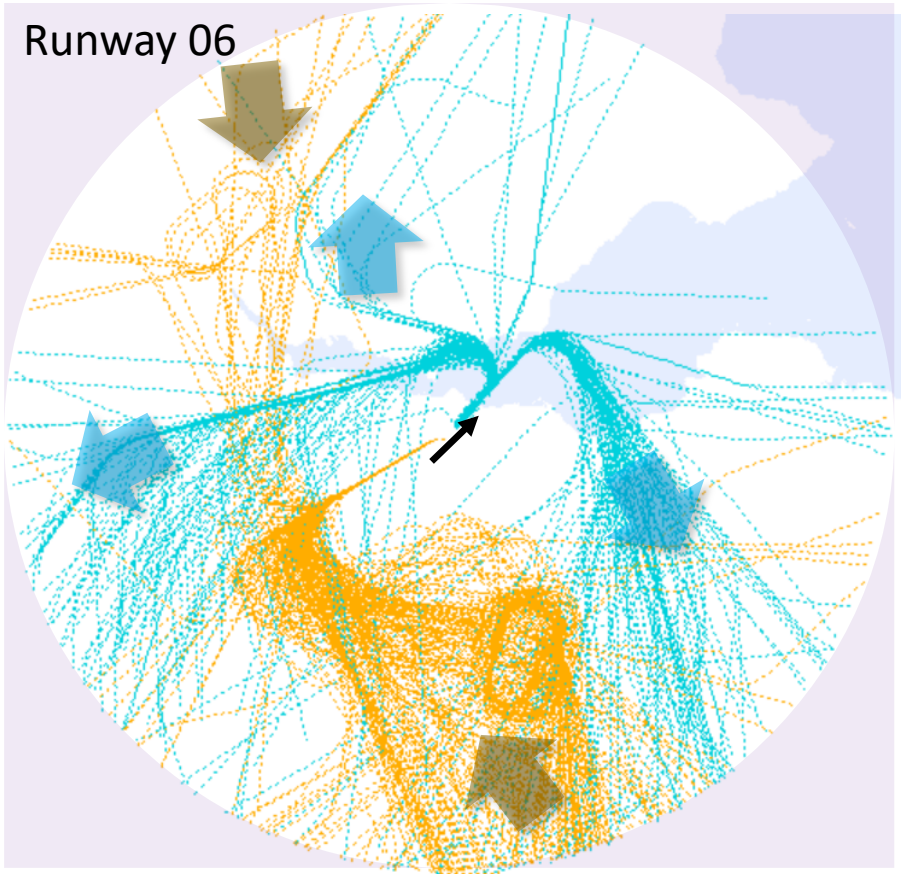
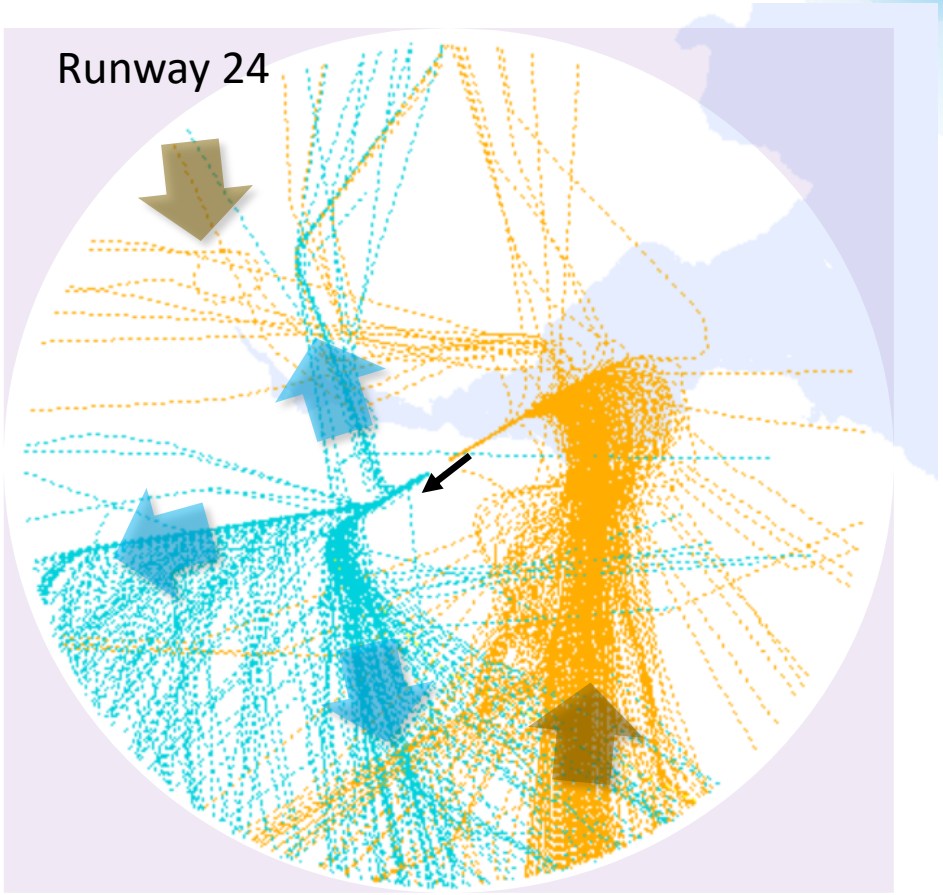
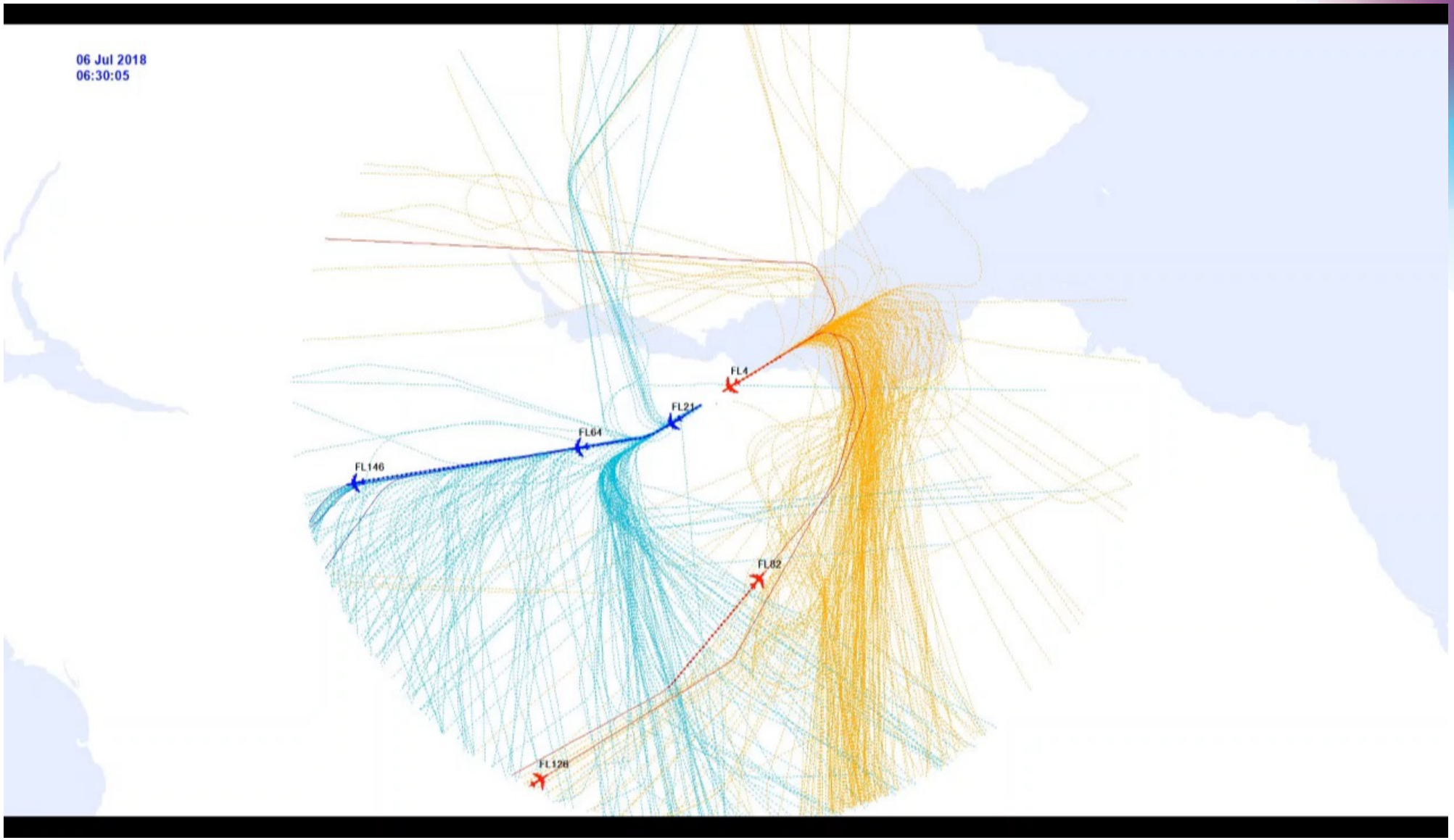
Actual tracks: Departures & approaches

Busy day summer 2018






06 Jul 2018
06:30:05
FL4
FL21
FL64
FL146
FL82
FL126

Arrivals and Approaches

4 Options

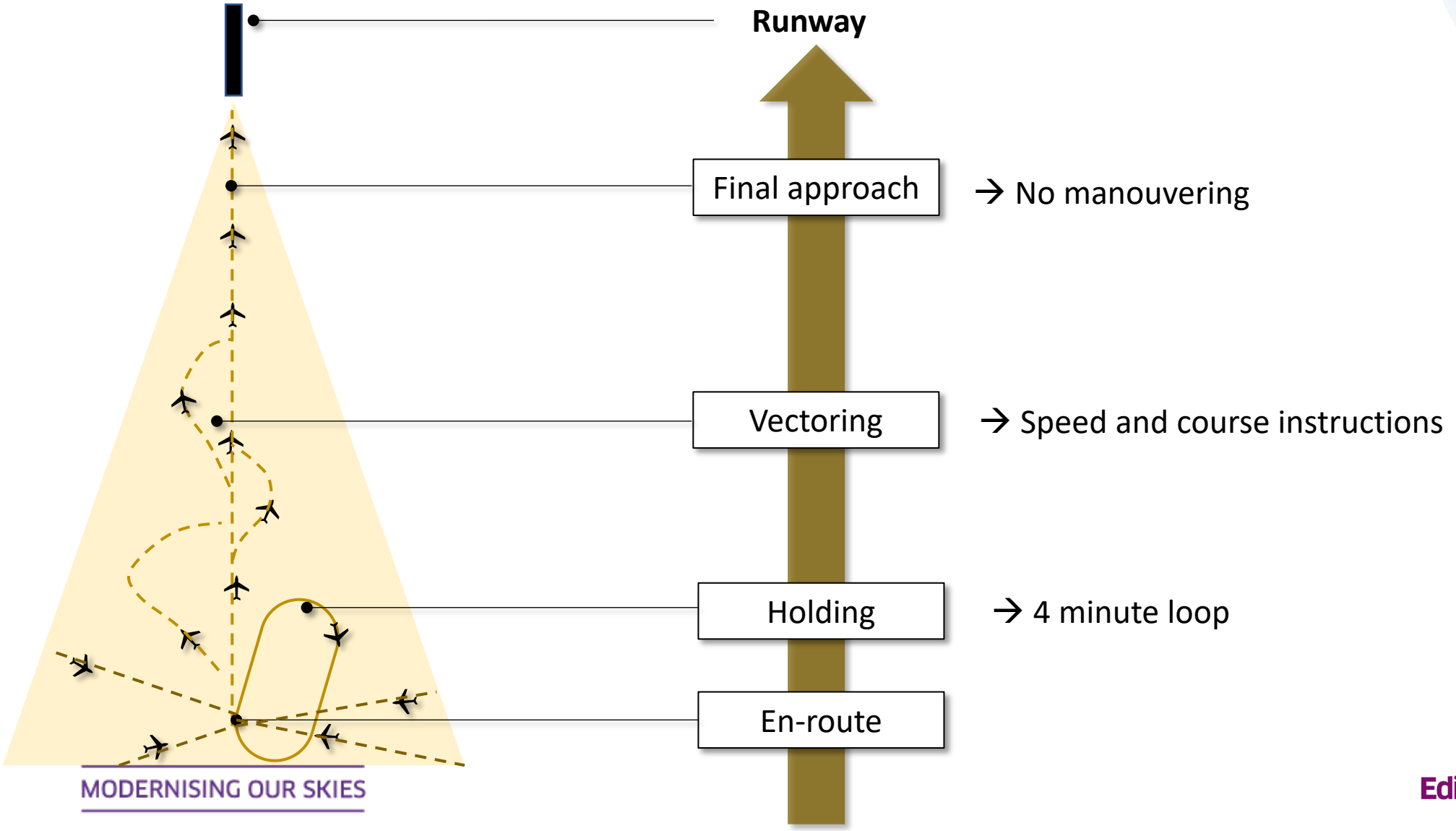
Holds if necessary to Radar vectoring

Some vectoring and some systemisation

Full systemisation

Point merge

Sequencing approaches



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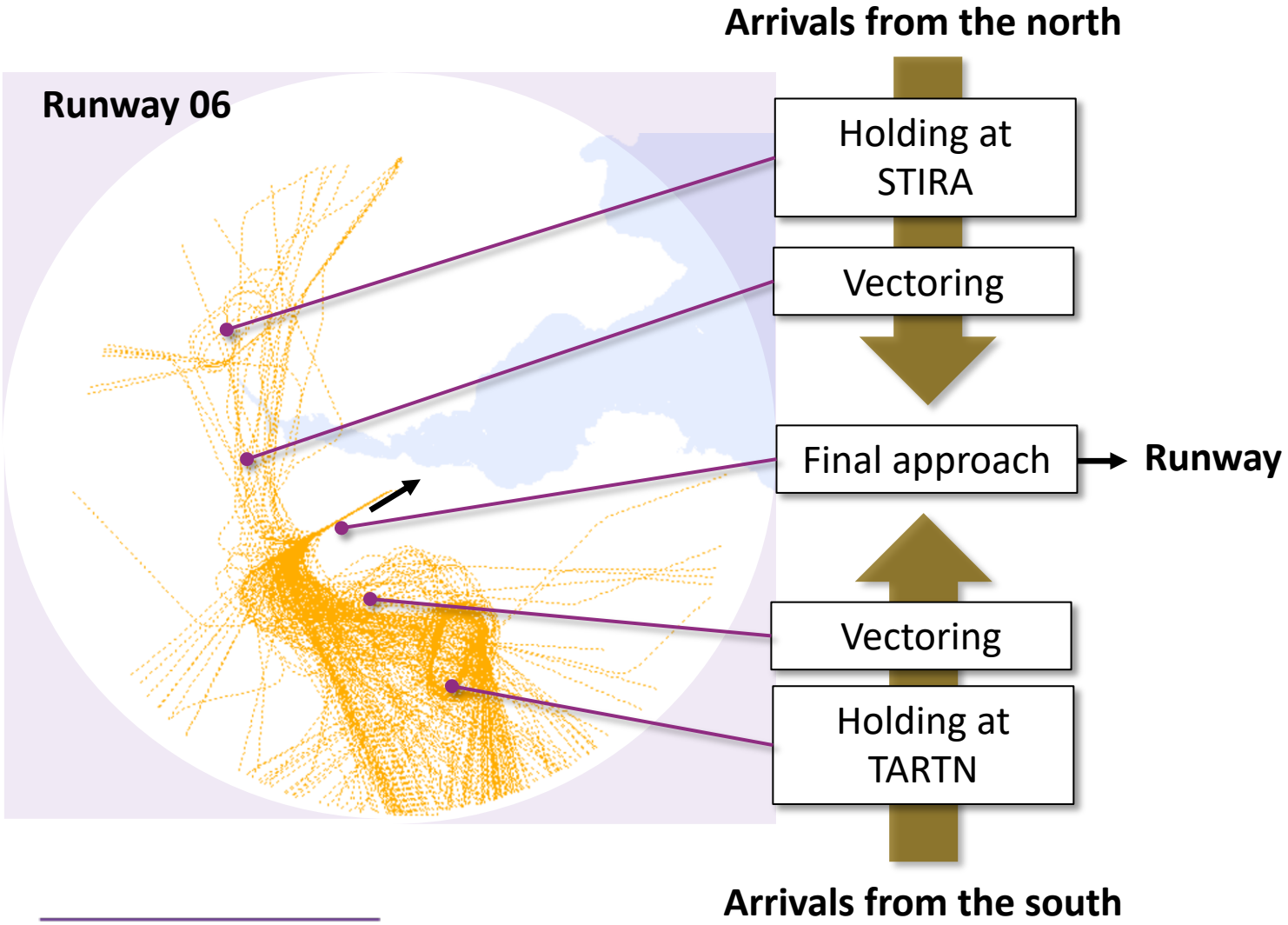
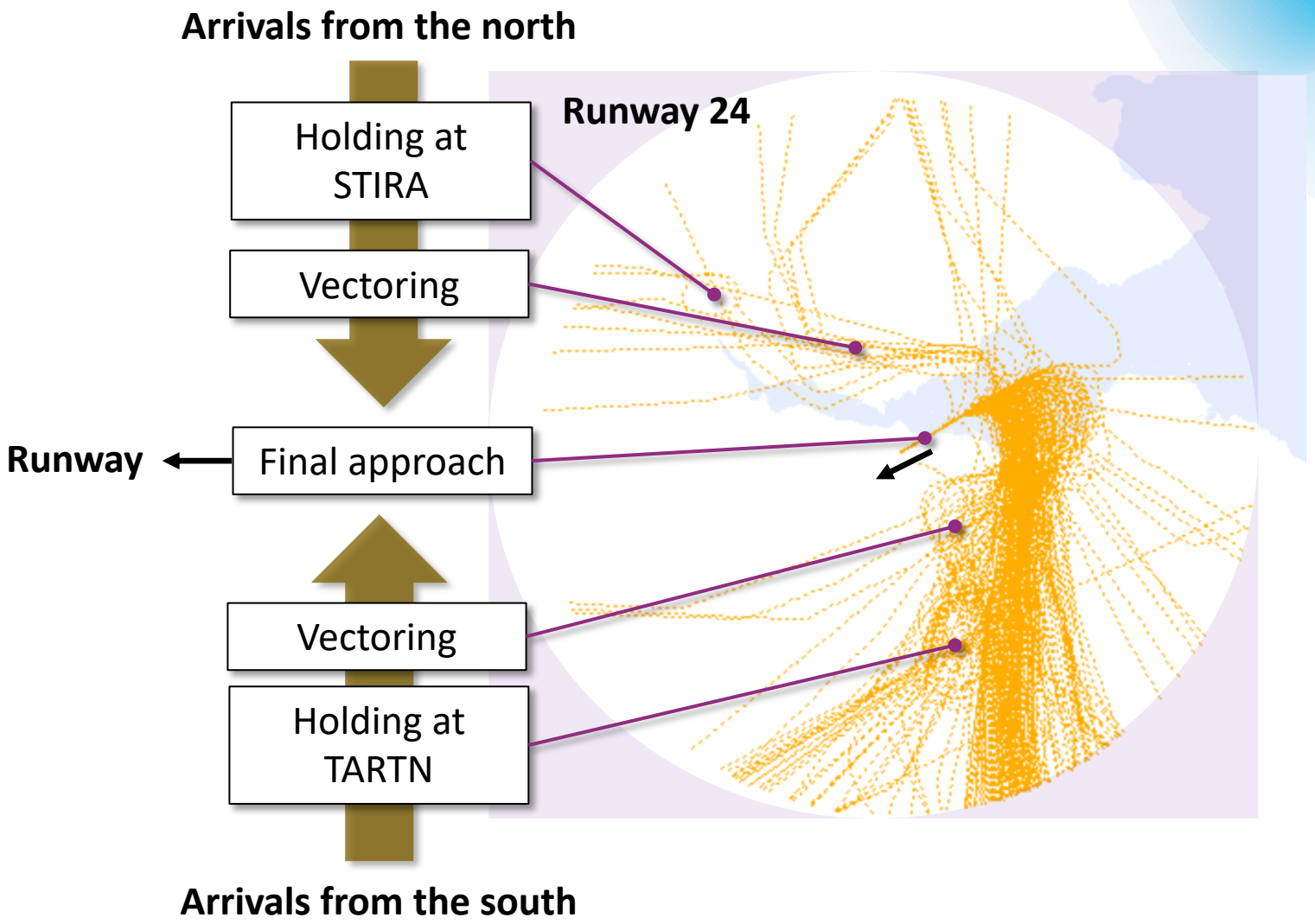
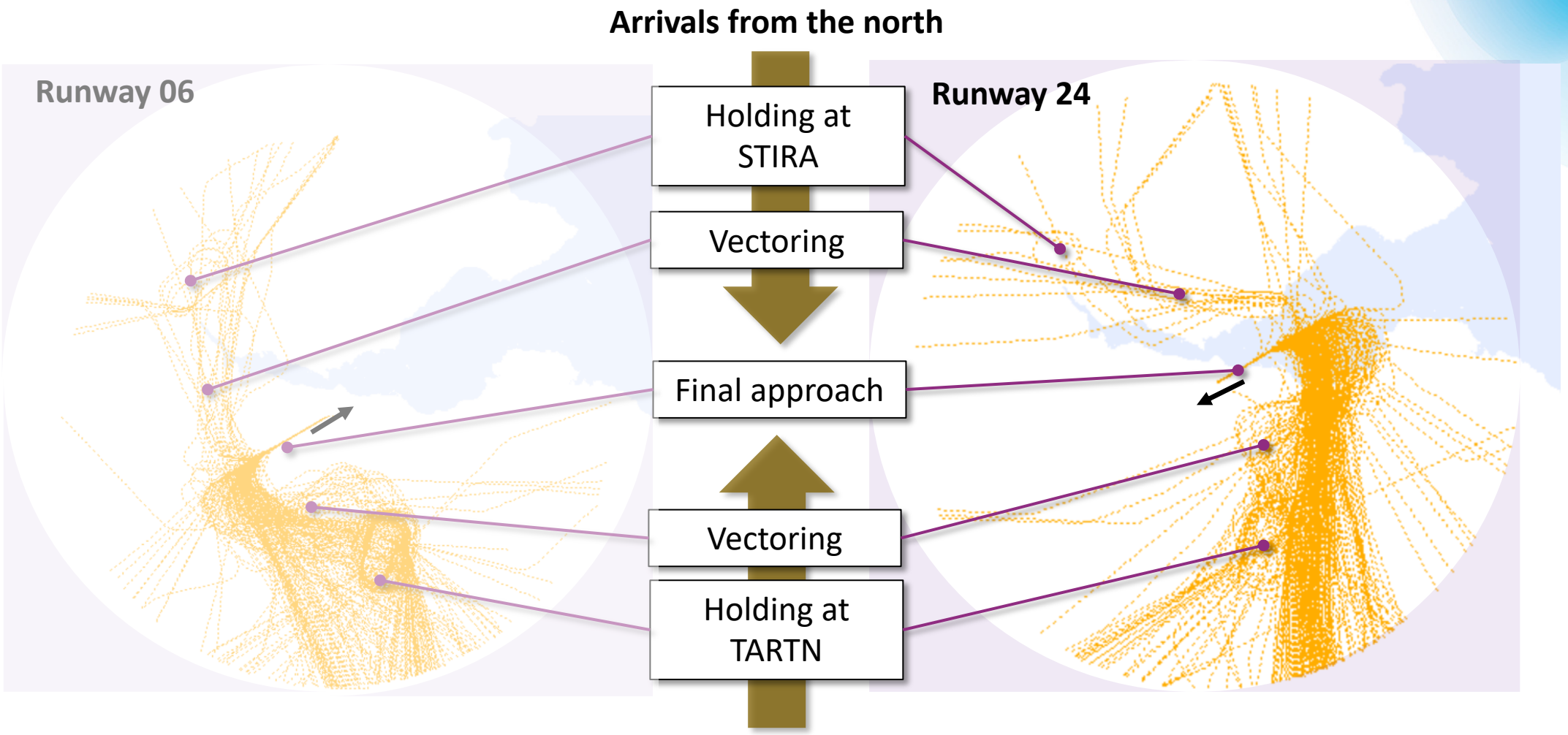
Actual tracks: Approaches



Actual tracks: Approaches



Actual tracks: Approaches



Arrival concepts

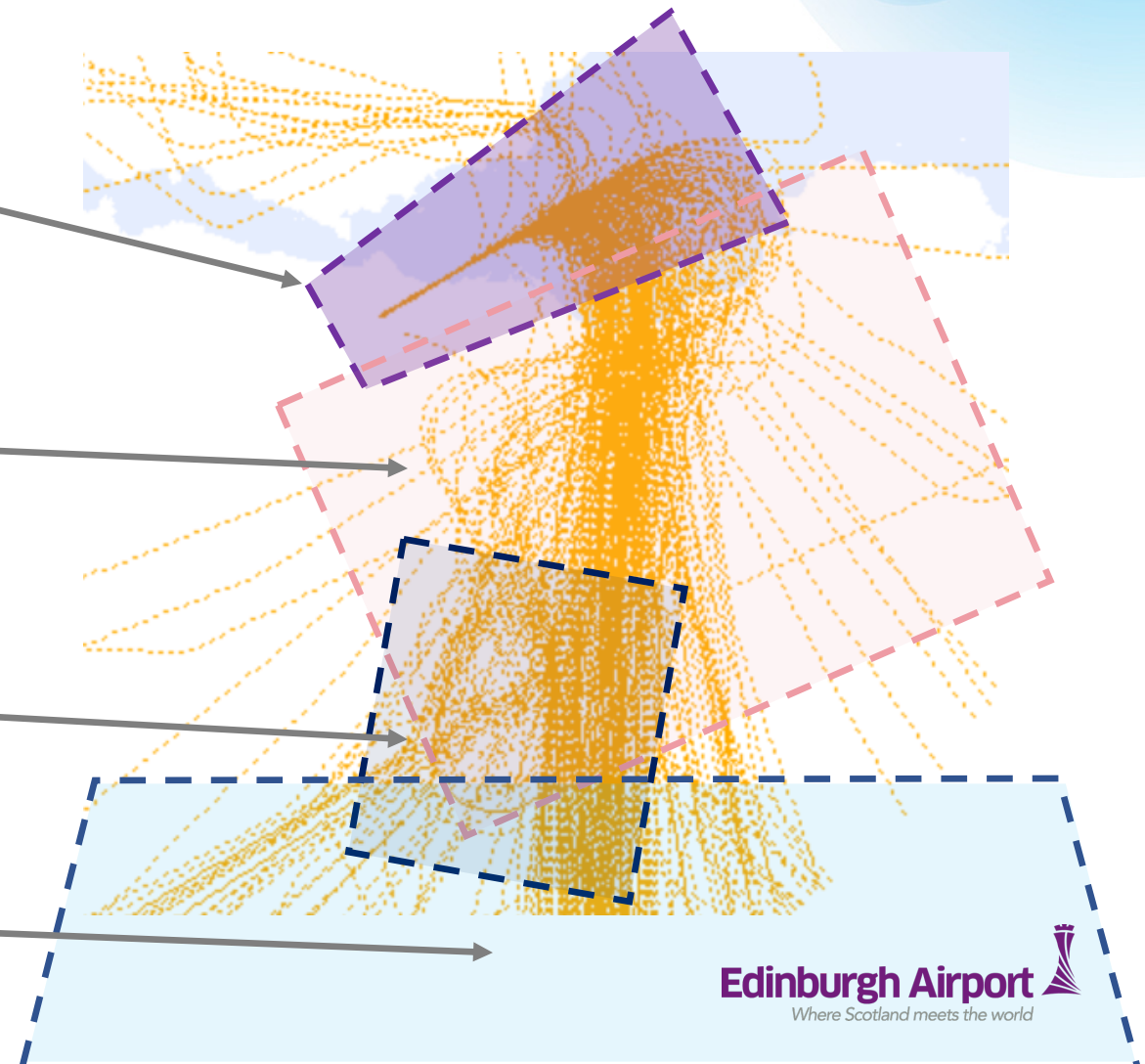
In the ACP NERL the arrival concepts are investigated

Final approach
Options:
- T-bar
- Y-bar

Intermediate
Options:
- Vectoring
- Approach transition + vectoring

Holding
Options:
- Hold
- Point merge + hold

En route system



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Capacity

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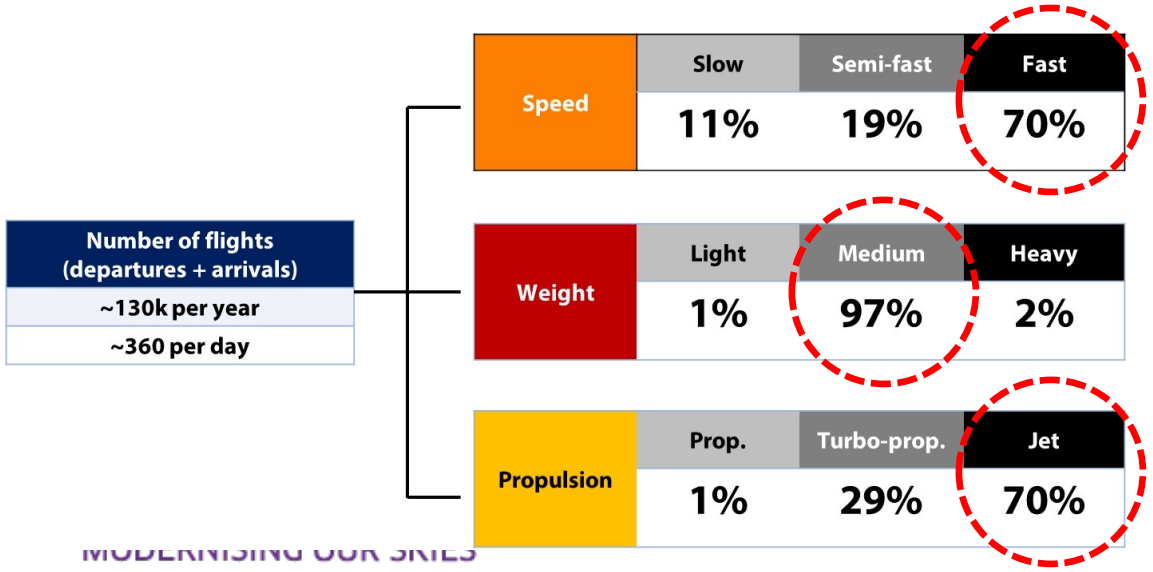
EDI ACP: Current departure capacity

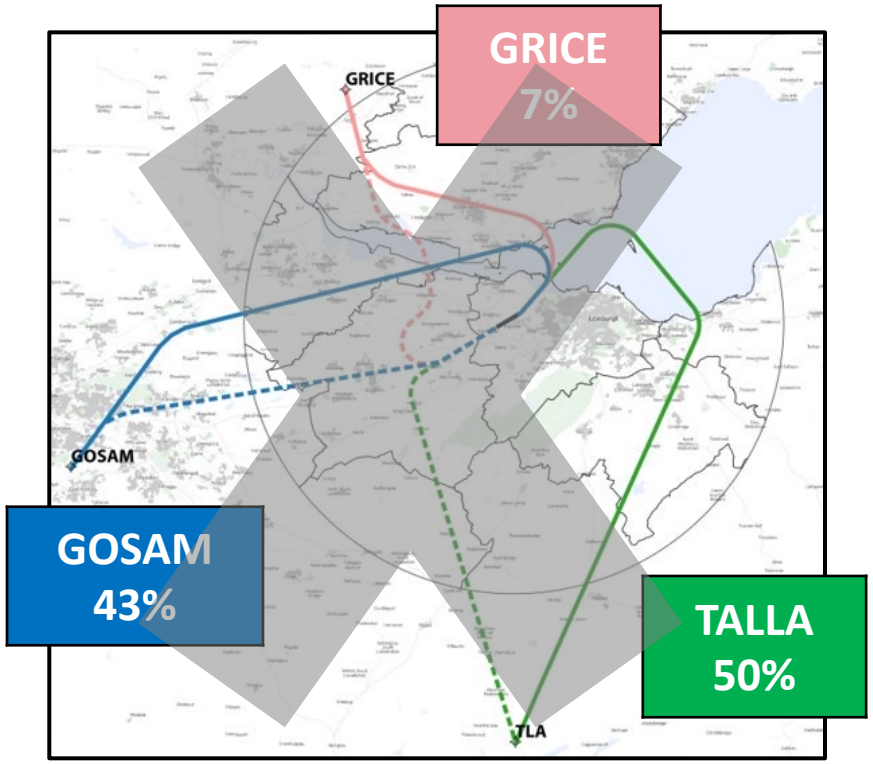
Dictated by:

- **Interval table**
- **Fleetmix**

		Leading aircraft		
		Slow	Semi-fast.	Fast
Following aircraft	Slow	**2 min.**	2 min.	1 min.
	Semi.-fast	3 min.	**2 min.**	2 min.
	Fast	4 min.	3 min.	**2 min.**

….and not the route structure, as all routes are considered as a ‘single route’





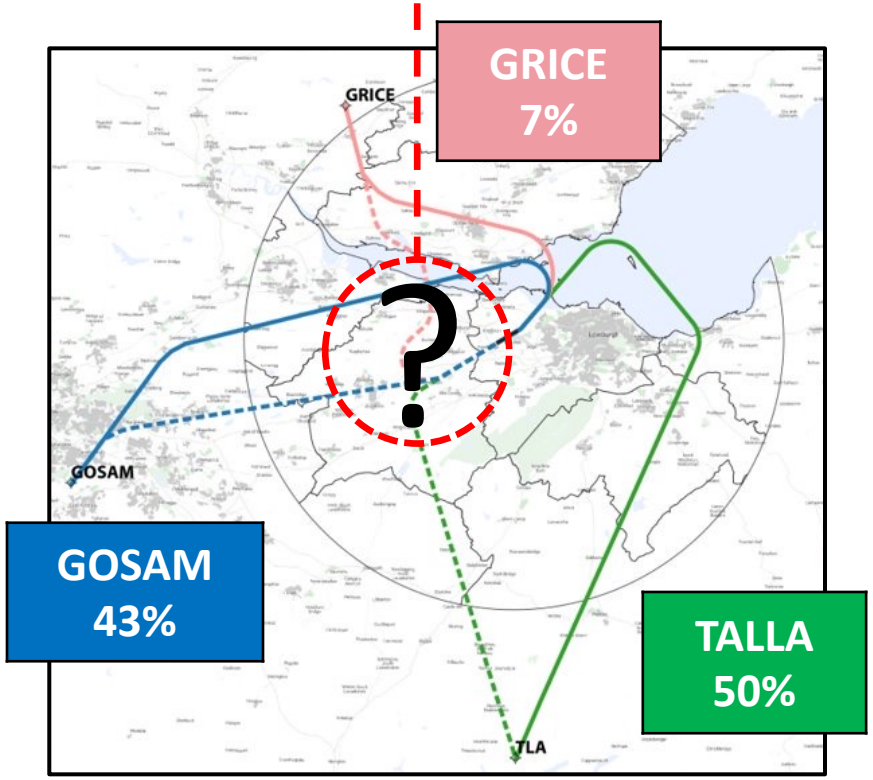
EDI ACP: Optioneering & departure capacity

1. What is the minimum safe interval between successive aircraft ?
2. How can the route design, and in specific the location of the split points of routes, contribute to the departure capacity ?

		Leading aircraft		
		Slow	Semi-fast.	Fast
Following aircraft	Slow	**2 min.**	2 min.	1 min.
	Semi.-fast	3 min.	**2 min.**	2 min.
	Fast	4 min.	3 min.	**2 min.**

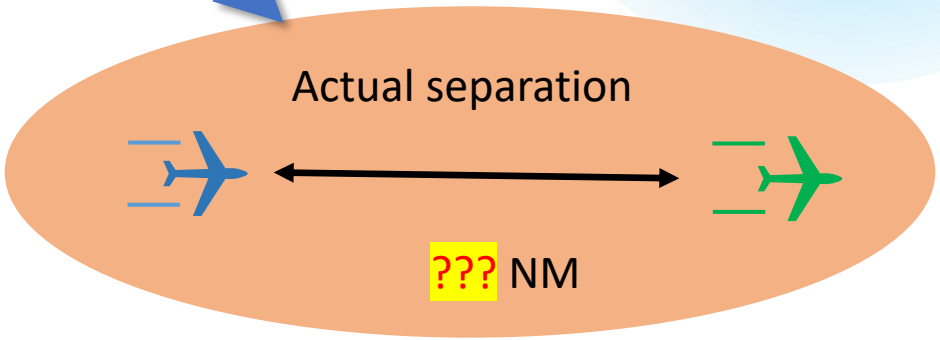
Number of flights (departures + arrivals)
~130k per year
~360 per day

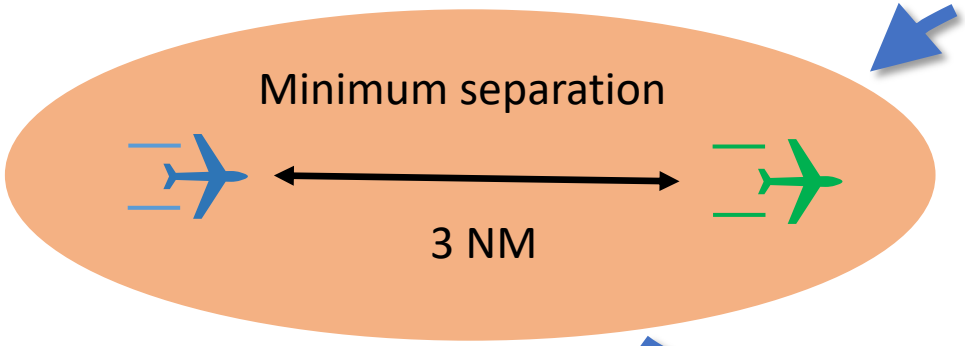
Speed	Slow	Semi-fast	Fast
	11%	19%	70%
Weight	Light	Medium	Heavy
	1%	97%	2%
Propulsion	Prop.	Turbo-prop.	Jet
	1%	29%	70%



EDI ACP: Optioneering & depature capacity

Following aircraft	Leading aircraft: Slow	Leading aircraft: Semi-fast.	Leading aircraft: Fast
Slow	**2 min.**	2 min.	1 min.
Semi.-fast	3 min.	**2 min.**	2 min.
Fast	4 min.	3 min.	**2 min.**





Following aircraft	Leading aircraft: Slow	Leading aircraft: Semi-fast.	Leading aircraft: Fast
Slow	??? **min.**	??? min.	??? min.
Semi.-fast	??? min.	??? **min.**	??? min.
Fast	??? min.	??? min.	??? **min.**

Next steps

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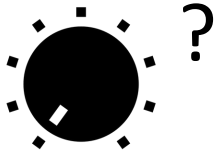
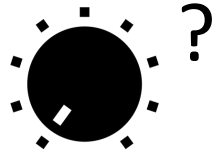
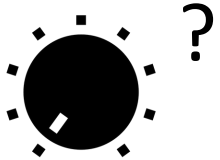
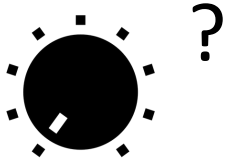
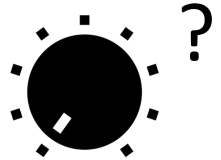
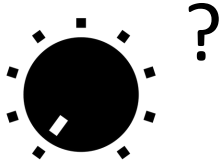
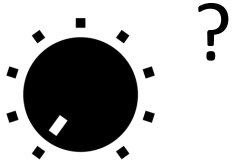
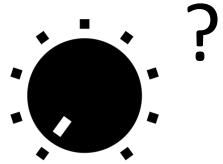
Re: EDI ACP = Airspace + ATC + routes

	Airspace system	ATC system	Route system
1. Modernise airspace			
2. Reduce delays, prepare for future growth			
3. May minise environmental impact			

Next Steps

NERL ACP

Airspace

- How much systemisation?
- Traffic flows upper airspace
- Sector capacity

Outbound

- SID connections points

Inbound

- Vectoring
- Point merge
- Hold positions

EDI ACP

Capacity

- Investigate on Safe intervals
- Investigate on role of split-point location (SIDs)

Define route options

- Create initial route options (‘mini swathes’) with input from:
  - NERL optioneering
  - Findings capacity study
  - Environmental aspects
  - Airspace and flight procedure design principles

Appraisal (qualitative)

- Apply other design principles to options

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Airspace Change Programme

- Any Questions ?
- Further Engagement with all DP's considered (late March – early April)
- Feedback to airspace_change@edinburghairport.com
- Virtual engagement platform during March

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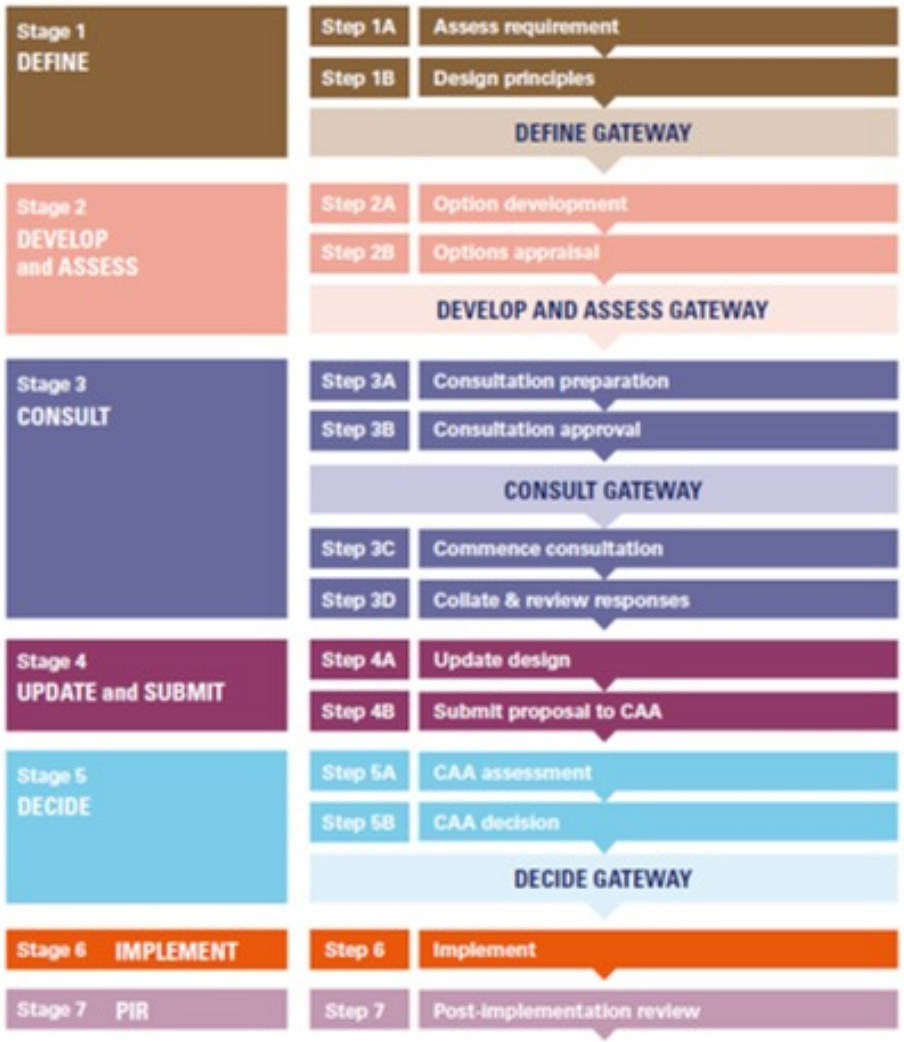
Annex B
Airspace Change Programme

- Stage 2: Options development
- Stage 2a: Ideas on design principles

Introduction

- Recap
- Capacity
- Departures
- Arrivals
- Environmental Design Principles

Programme Approach CAP 1616



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Stage 2A – Options Development

The change sponsor develops one or more options that address the Statement of Need and align with the defined design principles

Identify all possible route options

Aim:

Gathers feedback on the design options from stakeholders

Have the design principles been applied correctly ?

Described all options with capacity and airspace issues

We shall look at additional Controlled Airspace, areas to avoid and sensitive receptors.

Stage 2A Options development Community Concerns

- Noise
- Air Quality
- Track miles (carbon)
- Respite
- Sensitive receptors

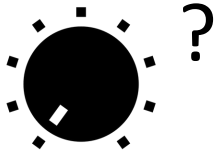
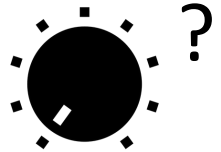
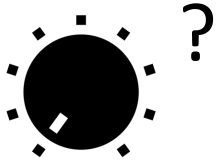
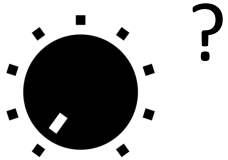
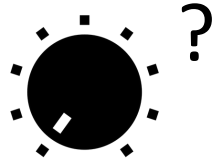
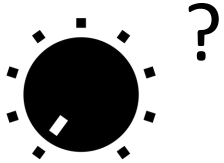
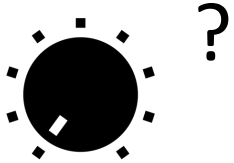
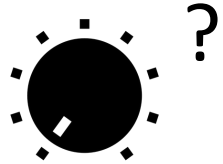
- Mapping and software – Stage 2B qualitative

Drivers for the airspace change

1. “PBN”	Modernise airspace	*“to meet technical requirements”*
2. Airspace capacity	Reduce delays, prepare for future growth	*“can meet existing and future demand by increasing the capacity of its runways and allow flights to depart with fewer delays and environmental impacts .”*
3. Environment	May minise environmental impact	*“in terms of the total number of people overflown, as well as when and how often they are overflown – while also cutting average CO2 emissions.”*

(Source: Statement of Need)

EDI ACP = Airspace + ATC + routes

	Airspace system	ATC system	Route system
1. Modernise airspace			
2. Reduce delays, prepare for future growth			
3. Minimise environmental impact			

Design Principles

Category	Number	Design principle
Safety (core)	FDP1	The airspace design and its operation must be as safe or safer than it is today.
Safety (core)	FDP2	Flight paths must be flyable and technically supported by air traffic control and airport technical management systems.
Operational (core)	FDP3	Flight paths must be designed to allow modern aircraft to use performance-based navigation (PBN) in line with CAA's modernisation strategy
Operational (core)	FDP4	Routes to/from Glasgow and Edinburgh airports must be procedurally deconflicted from the ground to a preferred level in coordination with NATS Prestwick.
Operational (core)	FDP5	The predictability of flight tracks must be maximised for consistency of operations.
Operational (core)	FDP6	Collaborate with other Scottish airports and NATS to ensure that the airspace design options are compatible with the wider programme of lower altitude and network airspace changes and accords with the CAA's published Airspace Modernisation Strategy (CAP 1711) and any current or future plans associated with it.

Design Principles

Health and wellbeing	FDP7	Flight paths should be designed to minimise the total adverse effect on health and quality of life created by aircraft noise and emissions.
Health and wellbeing	FDP8	For flightpaths at or above 4,000ft to below 7,000ft, the environmental priority should continue to be minimising the impact of aviation noise in a manner consistent with the government's overall policy on aviation noise, unless this would disproportionately increase CO_2 emissions.
Health and wellbeing	FDP9	Flight paths should be designed to minimise population overflown below 4,000ft and, between 4,000ft and 7,000ft, taking into account any potential adverse impact, due to those overflown having protected characteristics, as defined by the Equalities Act 2010.
Health and wellbeing	FDP10	Flight paths should be designed to minimise overflying sensitive locations and noise-sensitive receptors (for example, the zoo, retirement complexes, green spaces, historic heritage sites, and others).
Health and wellbeing	FDP11	Flight paths should be designed to include track concentration and/or track dispersal options to provide noise respite.
Operational	FDP12	Flight paths should be designed with routes that minimise track miles and fuel burn.
Operational	FDP13	Flight paths should be designed to ensure efficient and effective route management.
Technical	FDP14	Requirements of airspace users should be taken into account when designing flight paths.
Environment	FDP15	Flight paths should be designed to minimise adverse local air quality impacts.
Economy	FDP16	Airspace should be designed to maximise capacity in order to contribute economic benefits to Scotland, including tourism and trade.

The (current) system Recap

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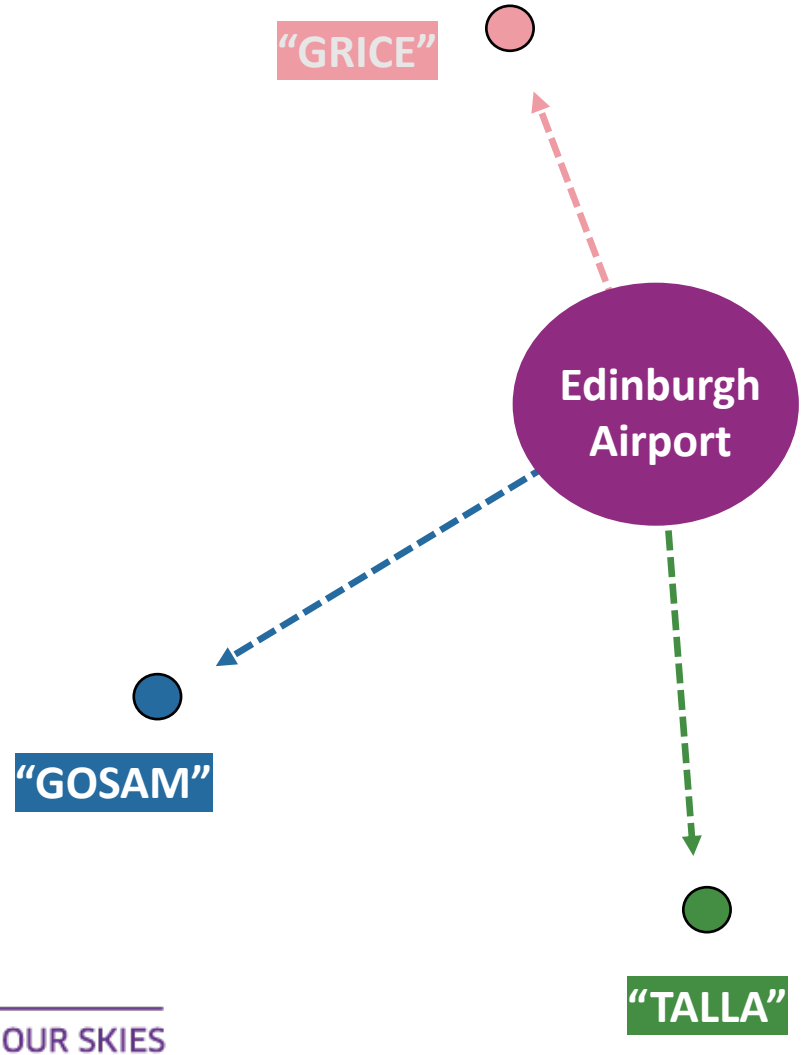
The system / (Departure) route exit points



Route exit points:

1) GOSAM
2) GRICE
3) TALLA

2 minutes separation – all routes

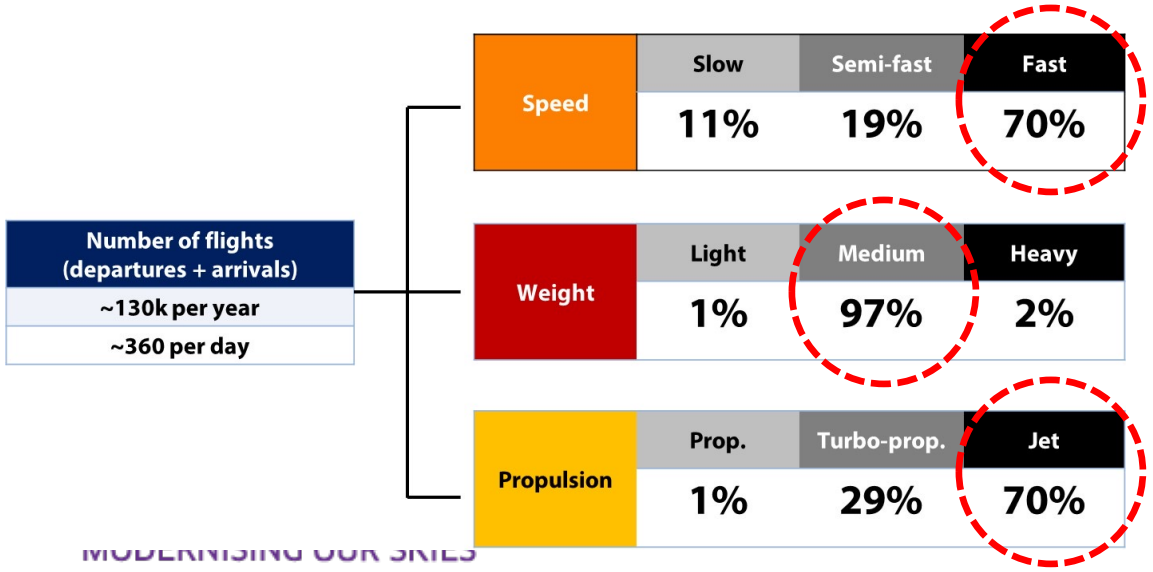
EDI ACP: Current departure capacity

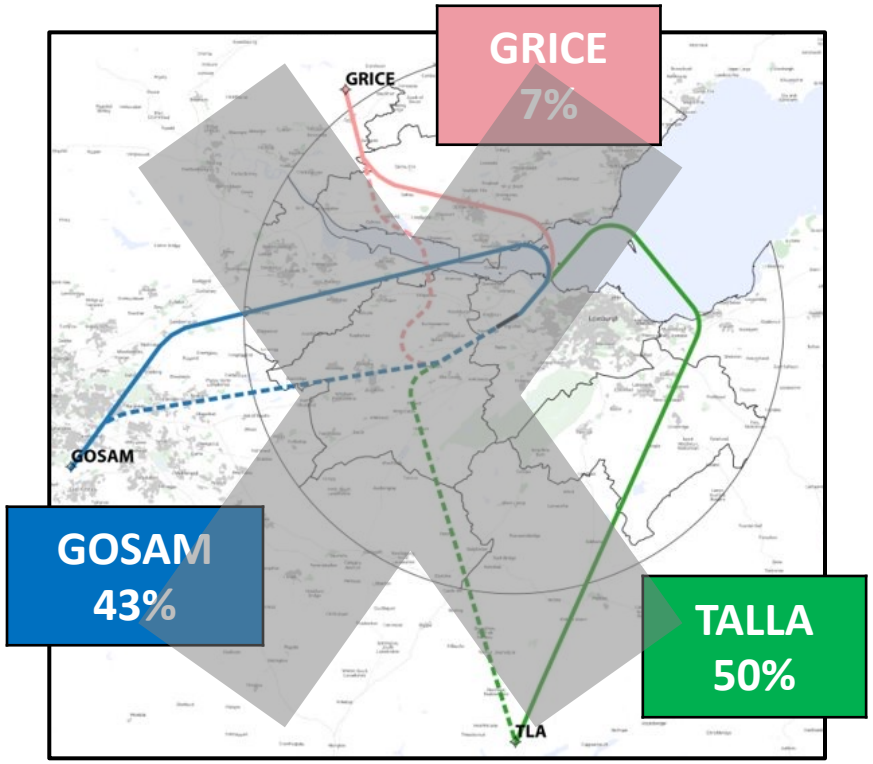
Dictated by:

- **Interval table**
- **Fleetmix**

		Leading aircraft		
		Slow	Semi-fast.	Fast
Following aircraft	Slow	**2 min.**	2 min.	1 min.
	Semi.-fast	3 min.	**2 min.**	2 min.
	Fast	4 min.	3 min.	**2 min.**

….and not the route structure, as all routes are considered as a ‘single route’





Capacity

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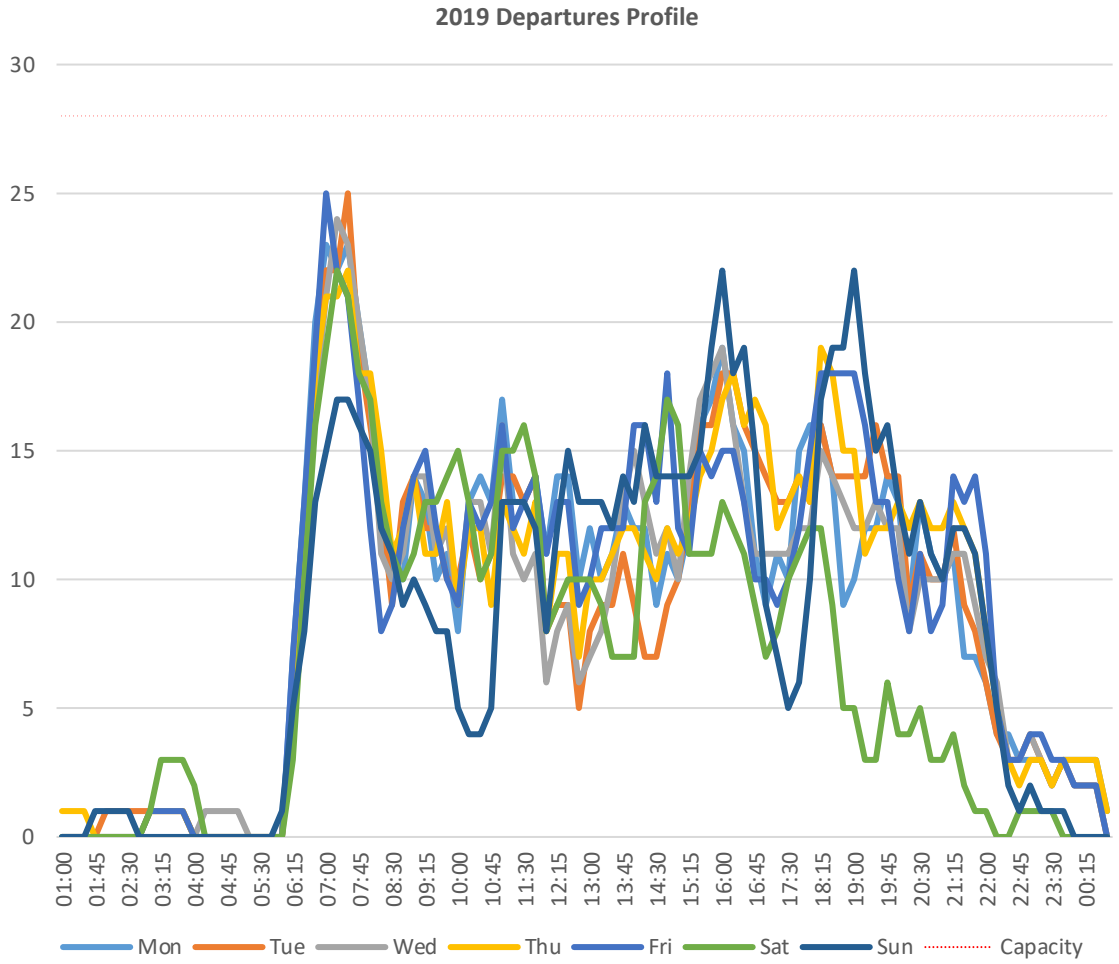
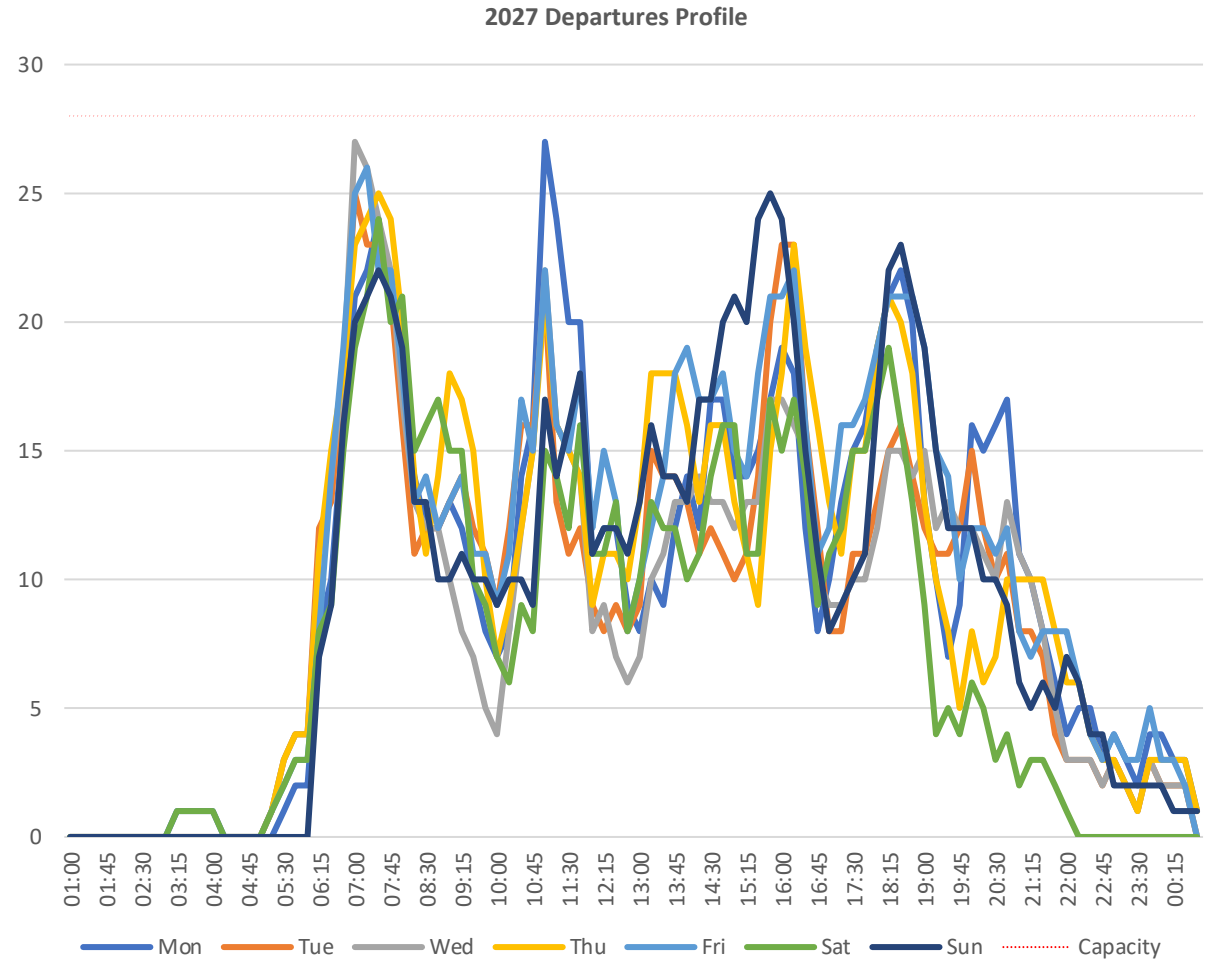
Runway – Departures Profile

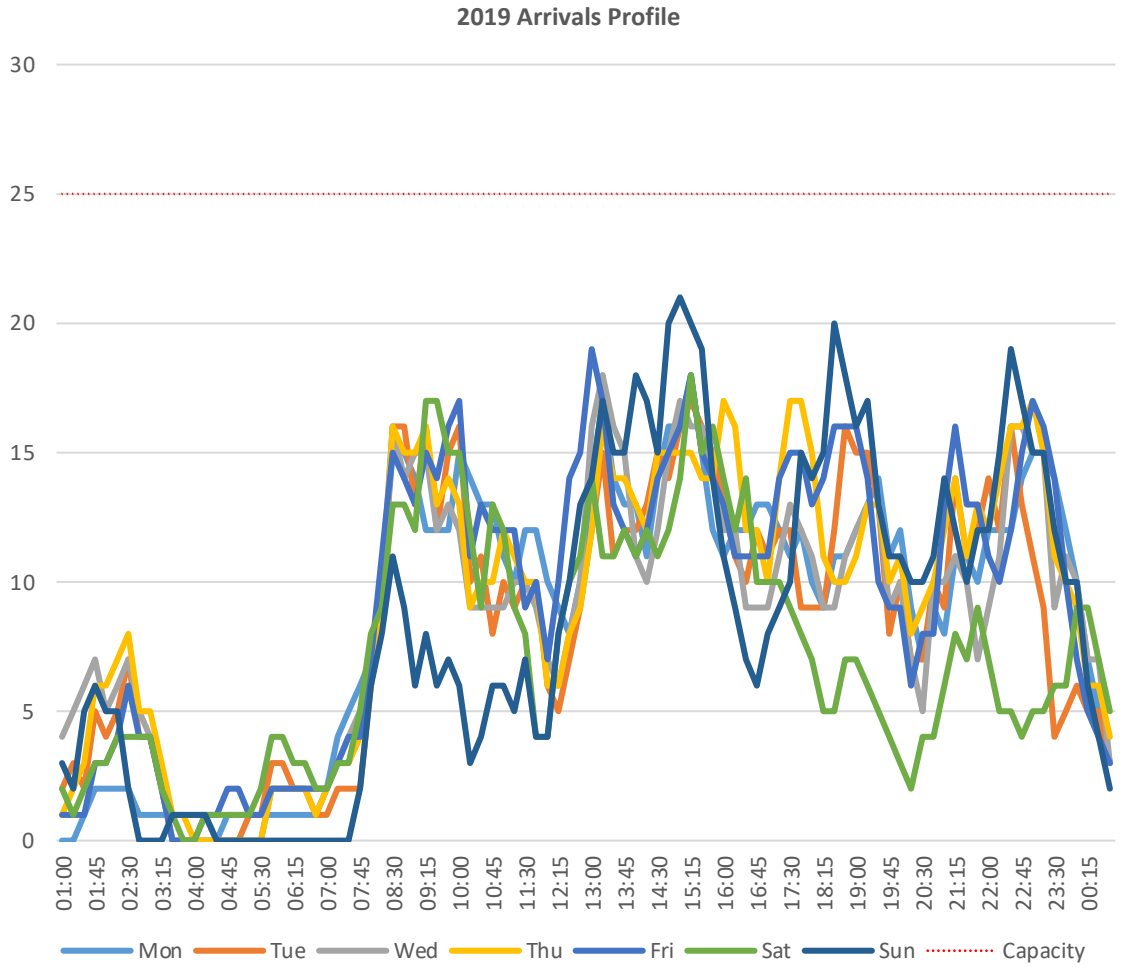
Second and third waves trend higher by 2027 vs 2019. Departure demand is close to capacity in 2027 with little resilience.

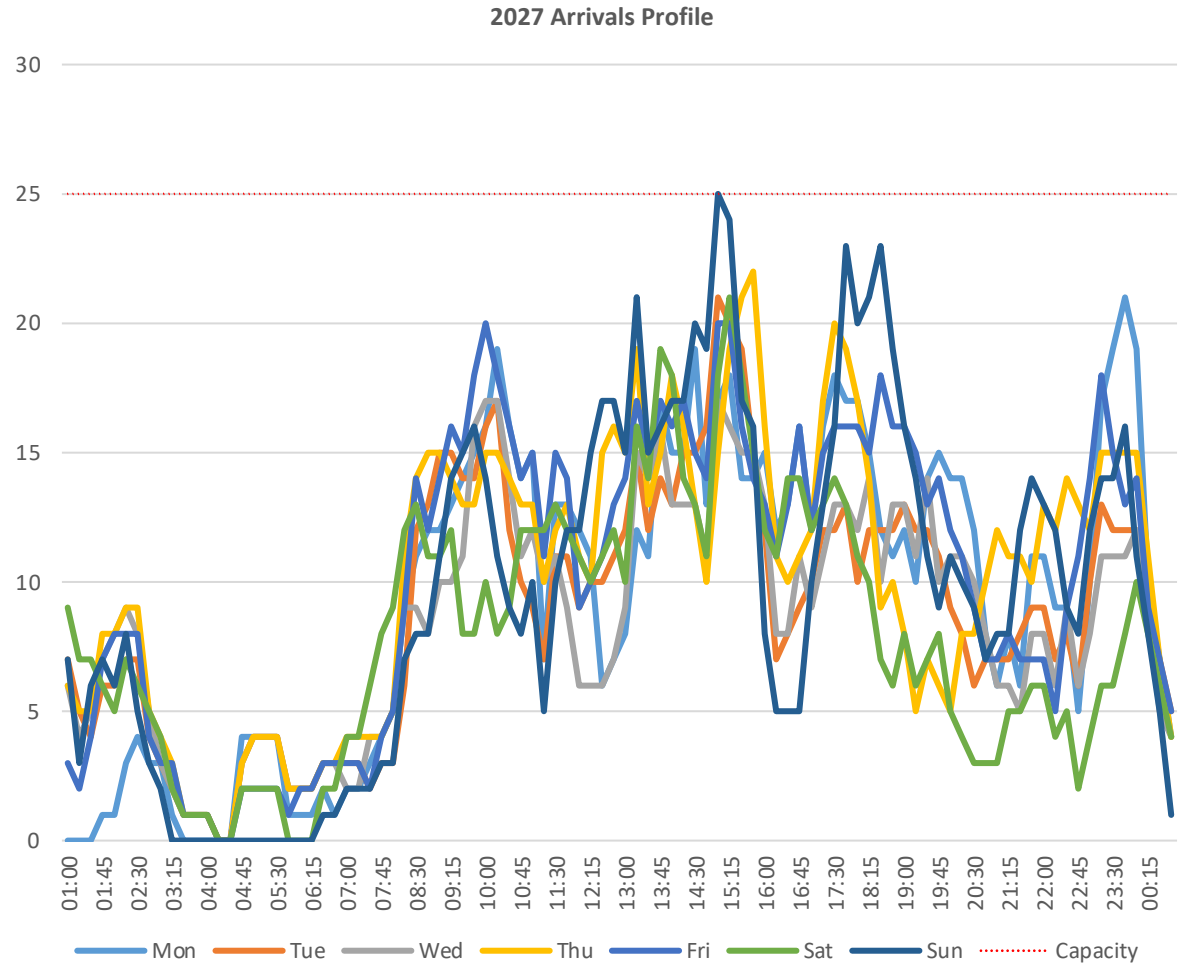




Runway – Arrivals Profile

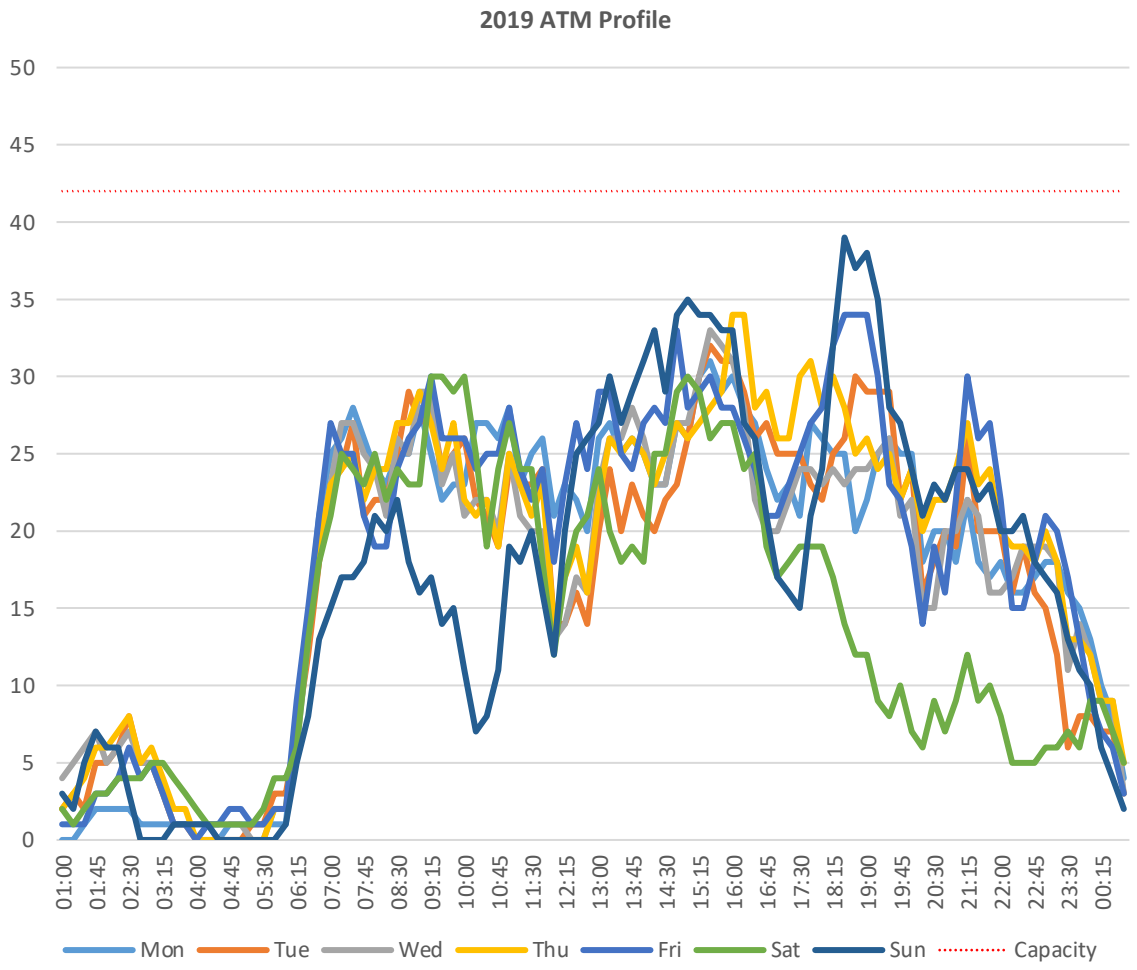
Increase in international and long-haul arrivals hit the 0830-1045 and 1400-1500 windows. Risk of no resilience on peak days.

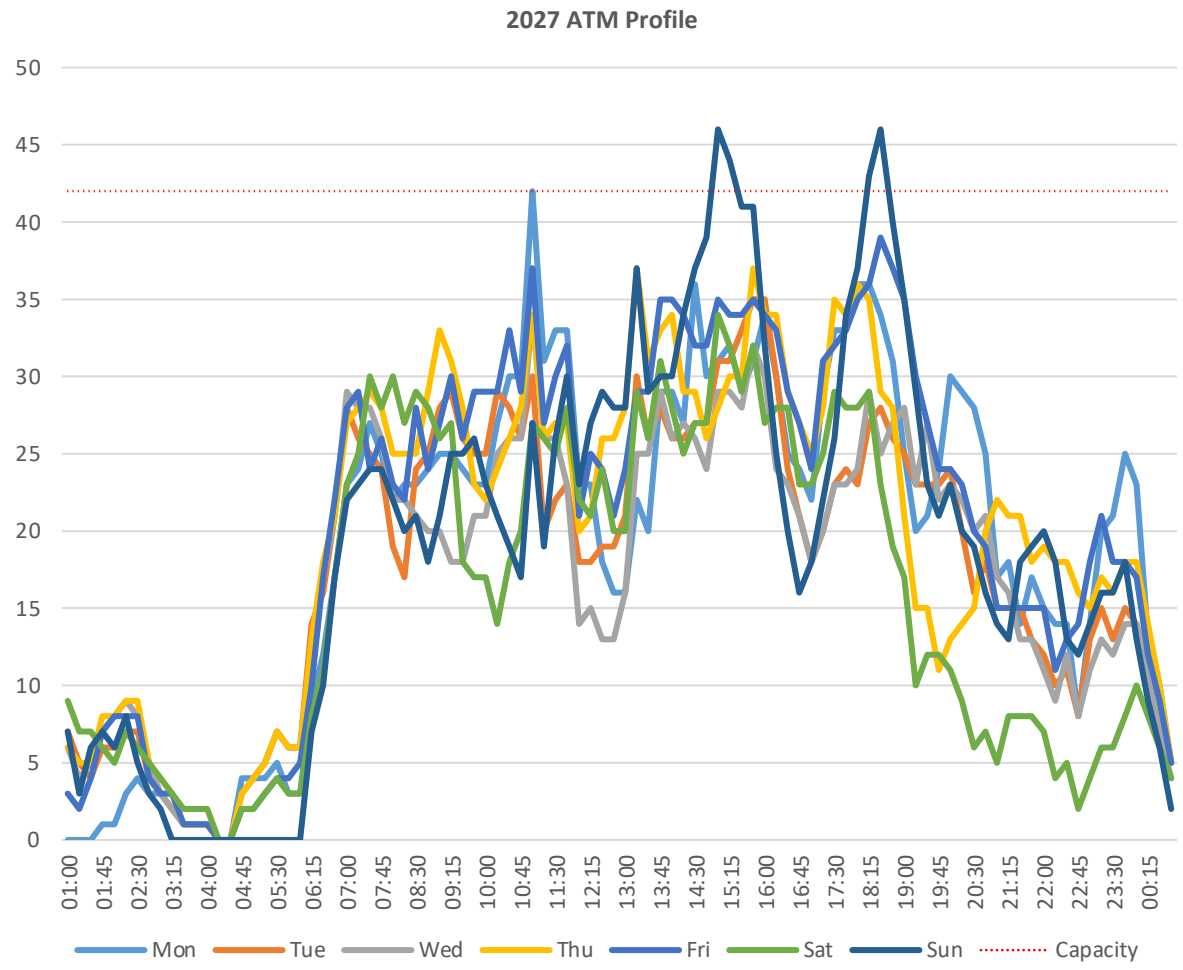




Runway – Movements Profile

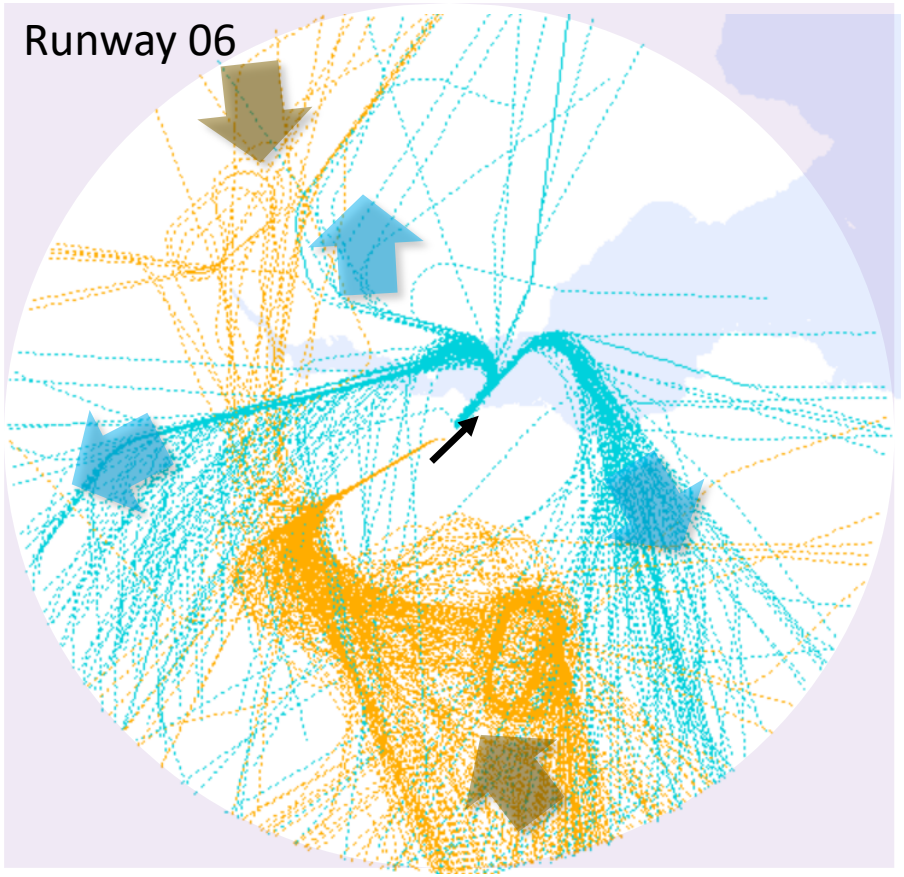
More “waves” by 2027 as shoulder periods fill-in. Risk of total movement demand exceeding movement capacity on peak days in 2027.

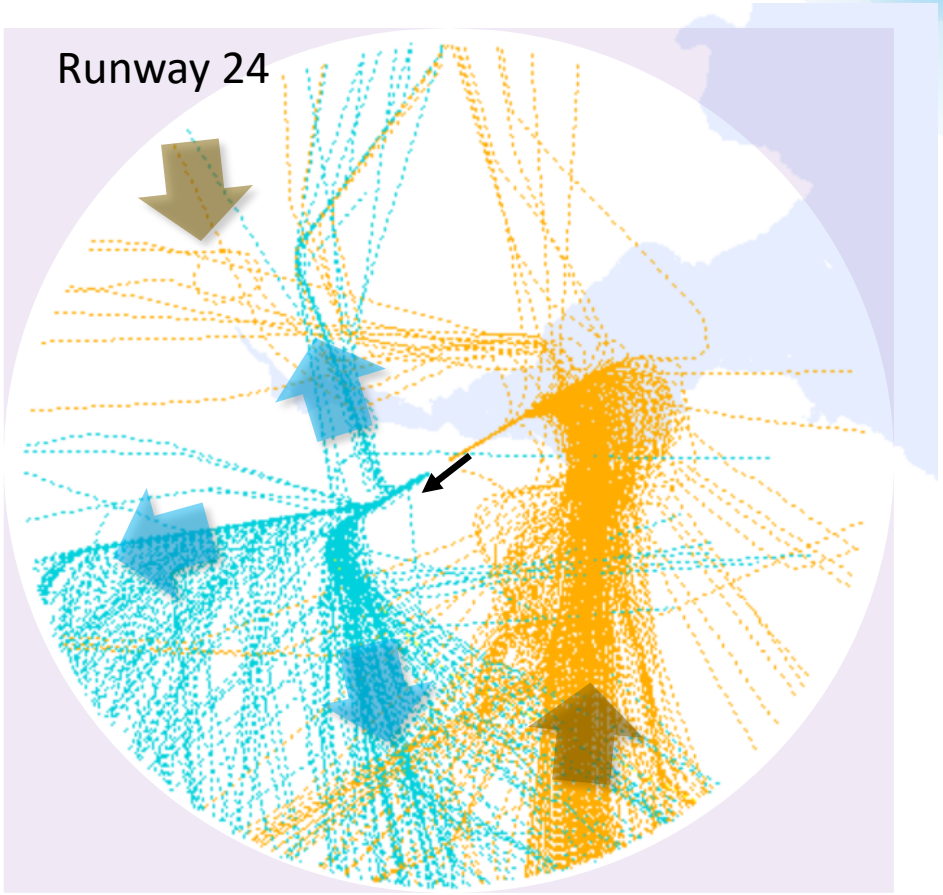


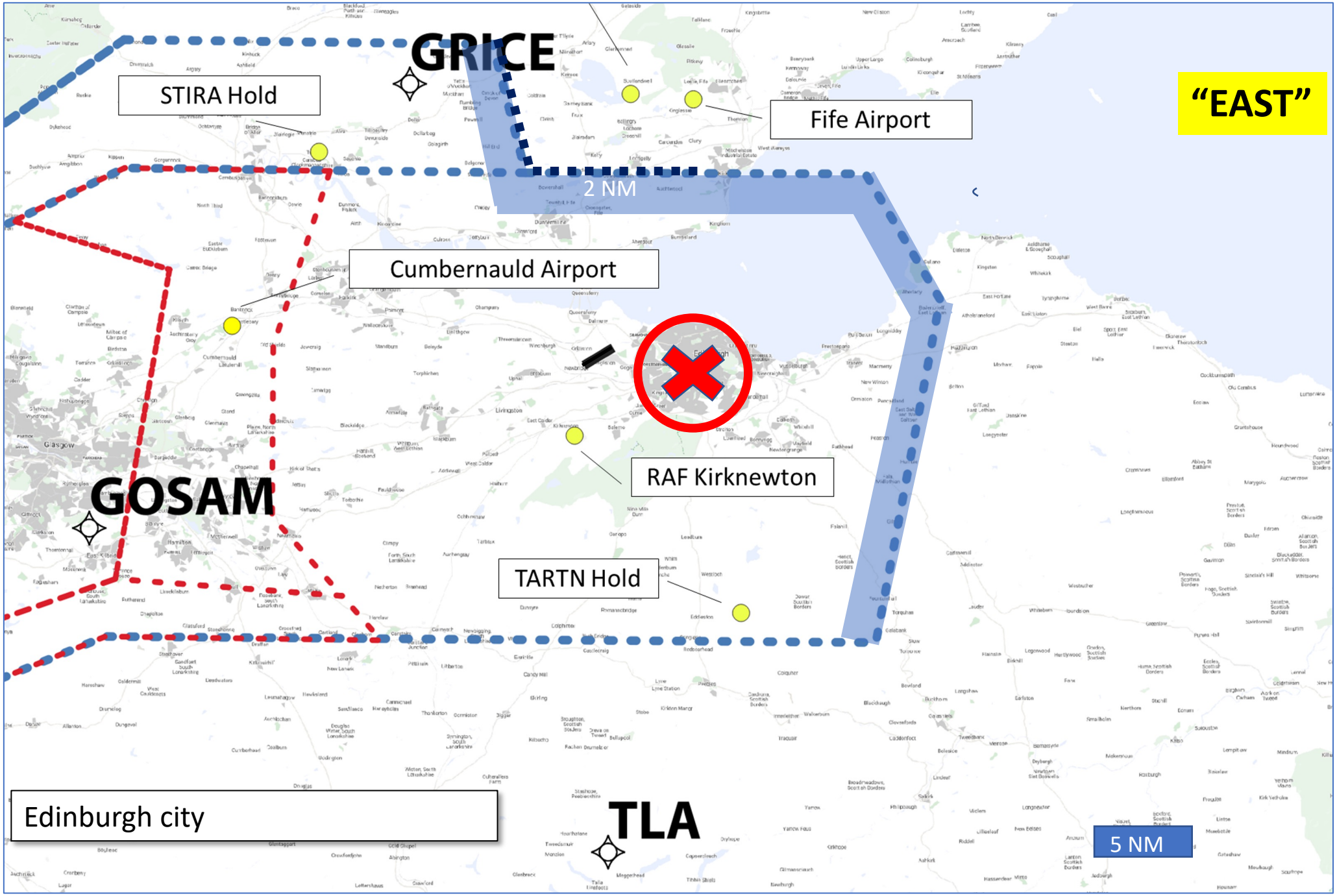


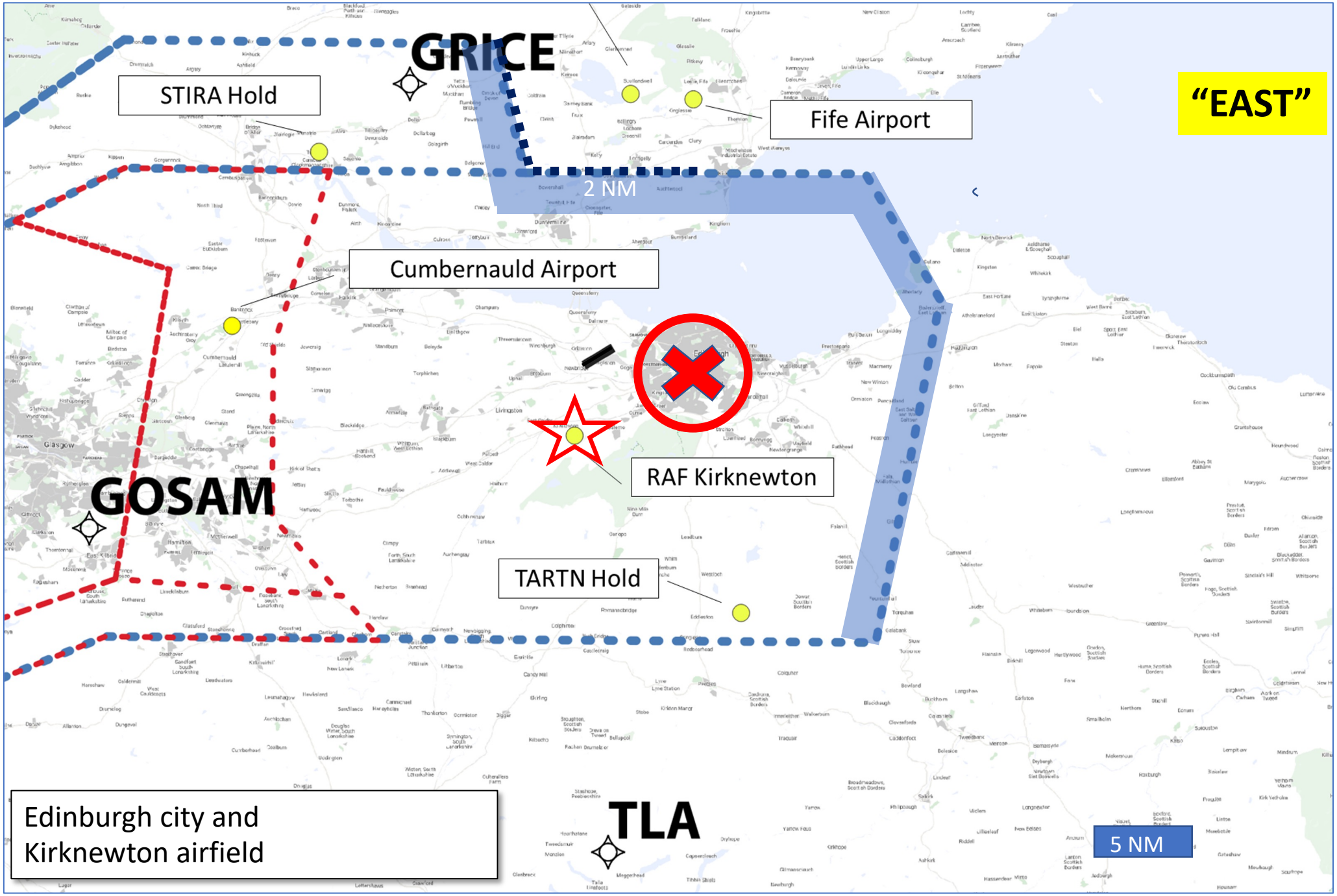
Actual tracks: Departures & approaches

Busy day summer 2018

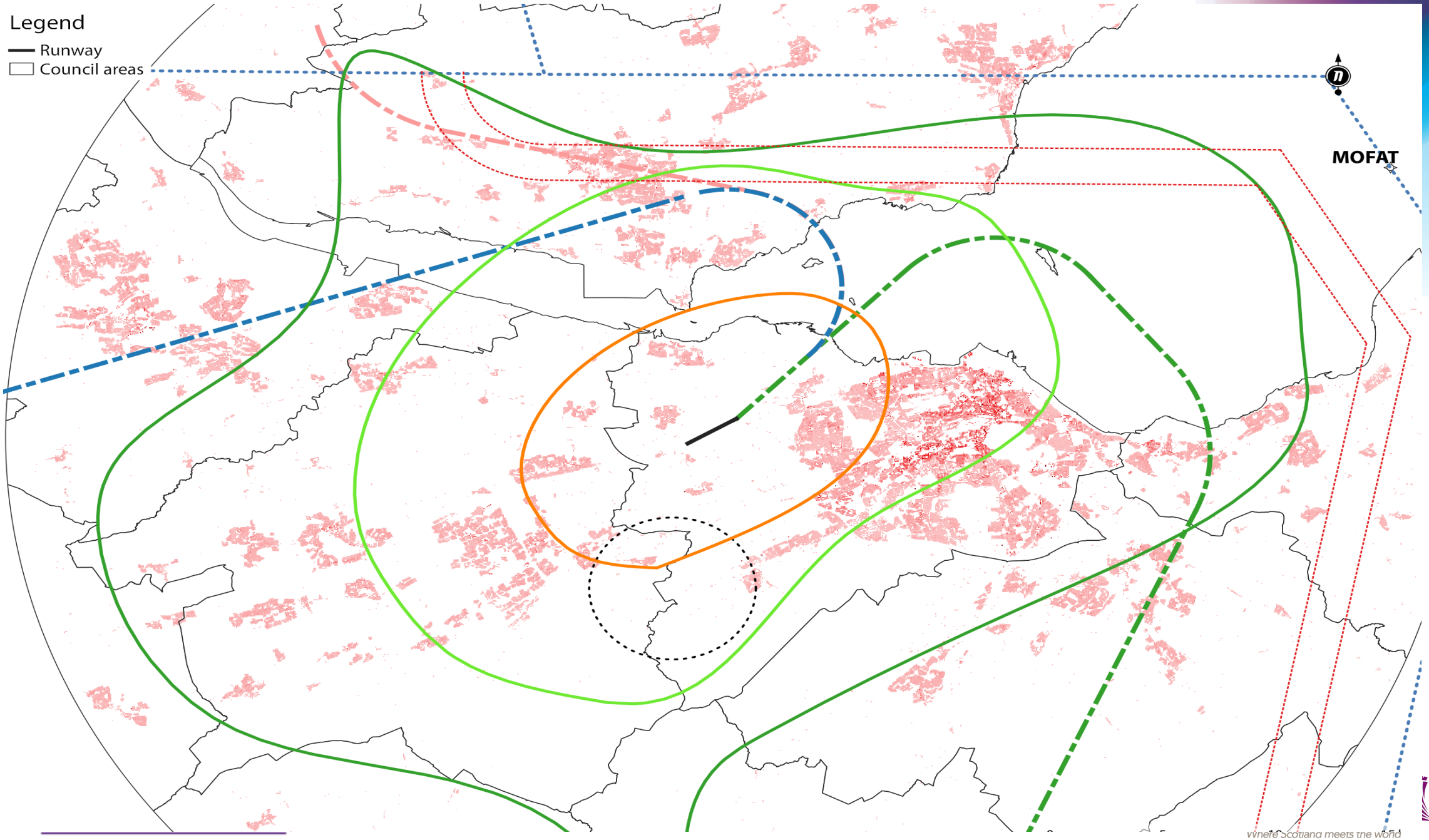


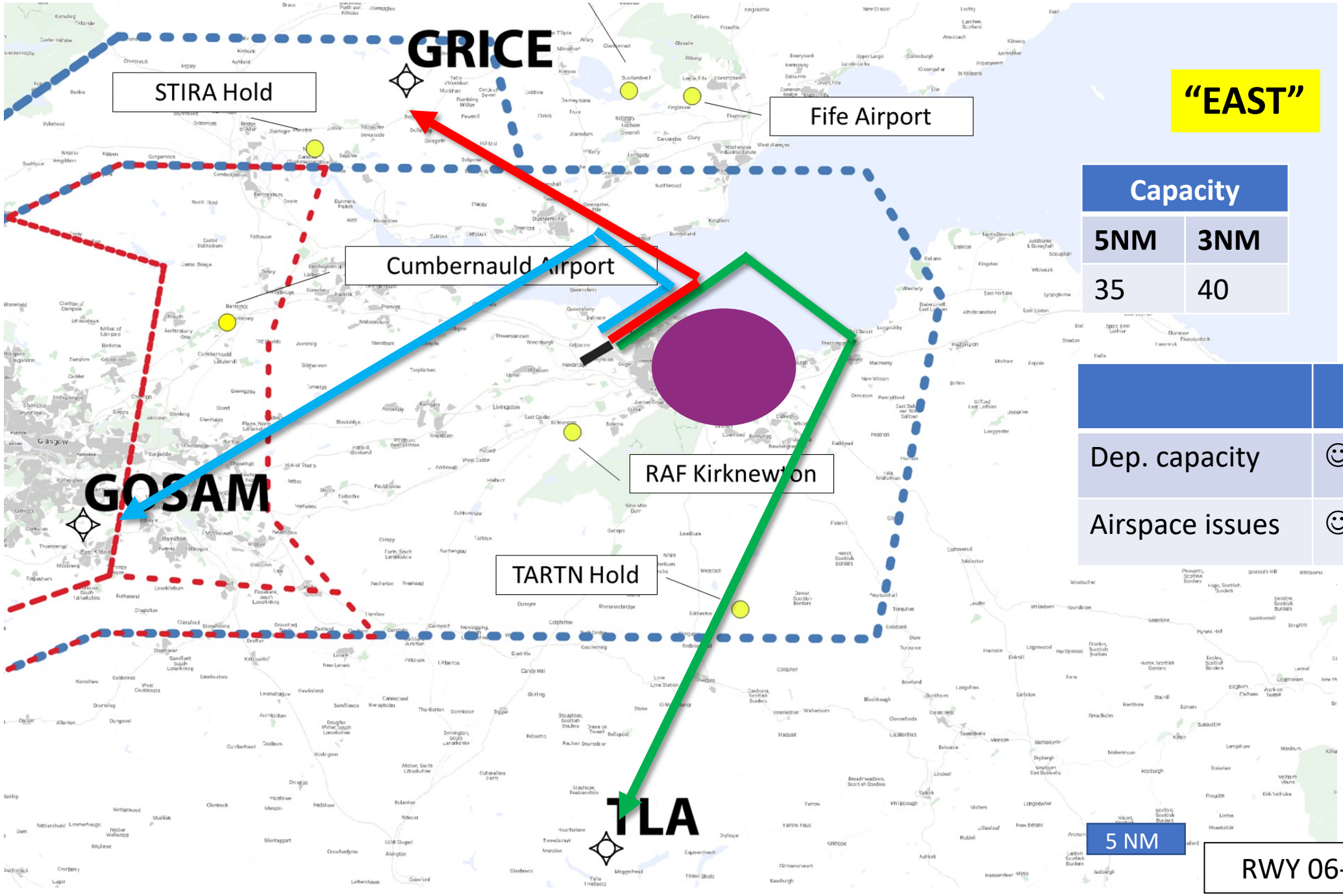


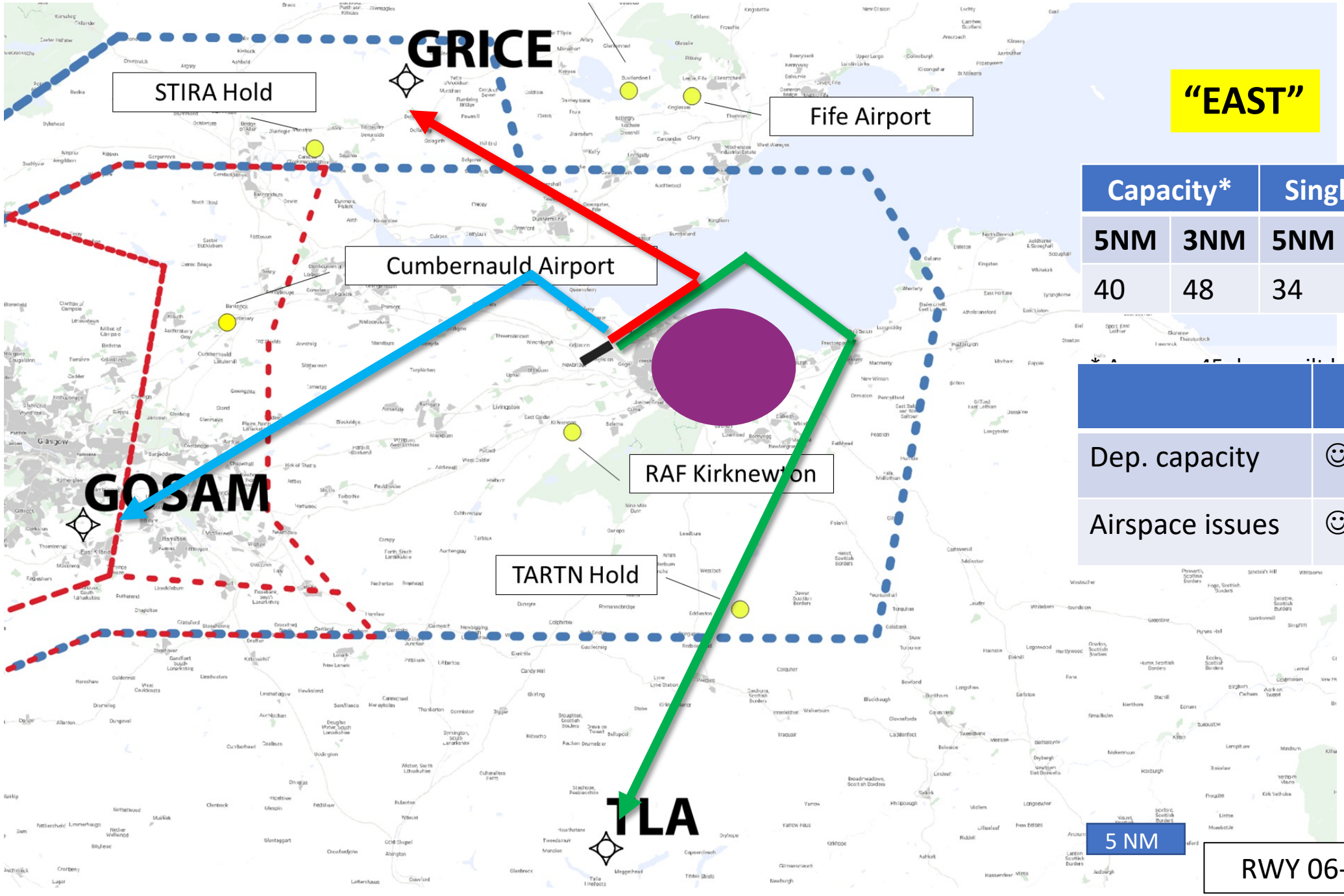

GRICE
STIRA Hold
Fife Airport
"EAST"
2 NM
Cumbernauld Airport
RAF Kirknewton
GOSAM
TARTN Hold
Edinburgh city
TLA
5 NM


GRICE
STIRA Hold
Fife Airport
"EAST"
2 NM
Cumbernauld Airport
RAF Kirknewton
GOSAM
TARTN Hold
TLA
Edinburgh city and
Kirknewton airfield
5 NM

RWY 06
3 exit points
(GOSAM via North)


Legend
Runway
Council areas
MOFAT


GRICE
STIRA Hold
Fife Airport
"EAST"
Capacity
5NM
3NM
35
40
Cumbernauld Airport
RAF Kirknewton
GOSAM
TARTN Hold
TLA
Dep. capacity
☺
Airspace issues
☺
5 NM
RWY 06-3xt-#1

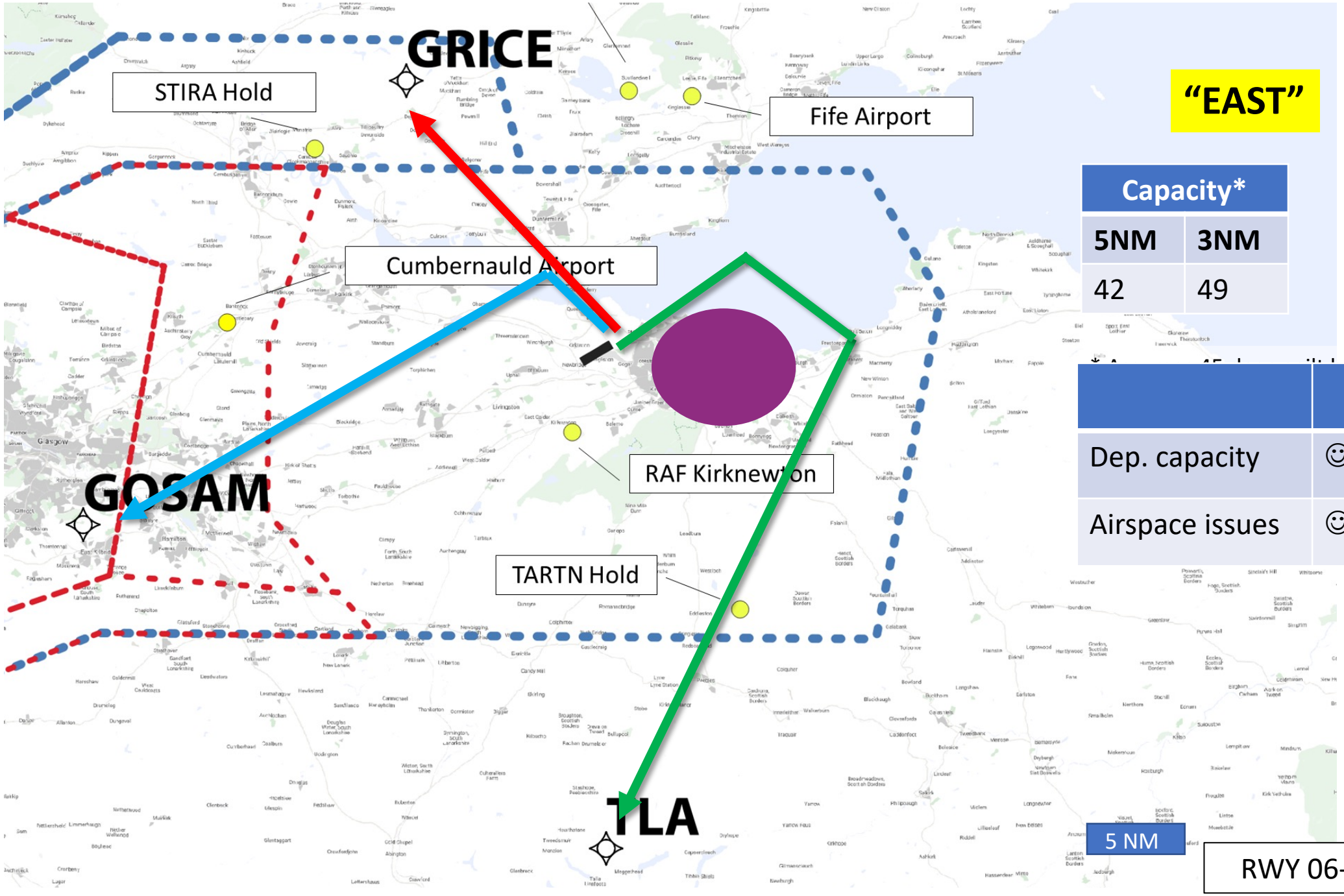


"EAST"

Capacity*		Single SID	
5NM	3NM	5NM	3NM
40	48	34	40

Dep. capacity	☺(☺)
Airspace issues	☺

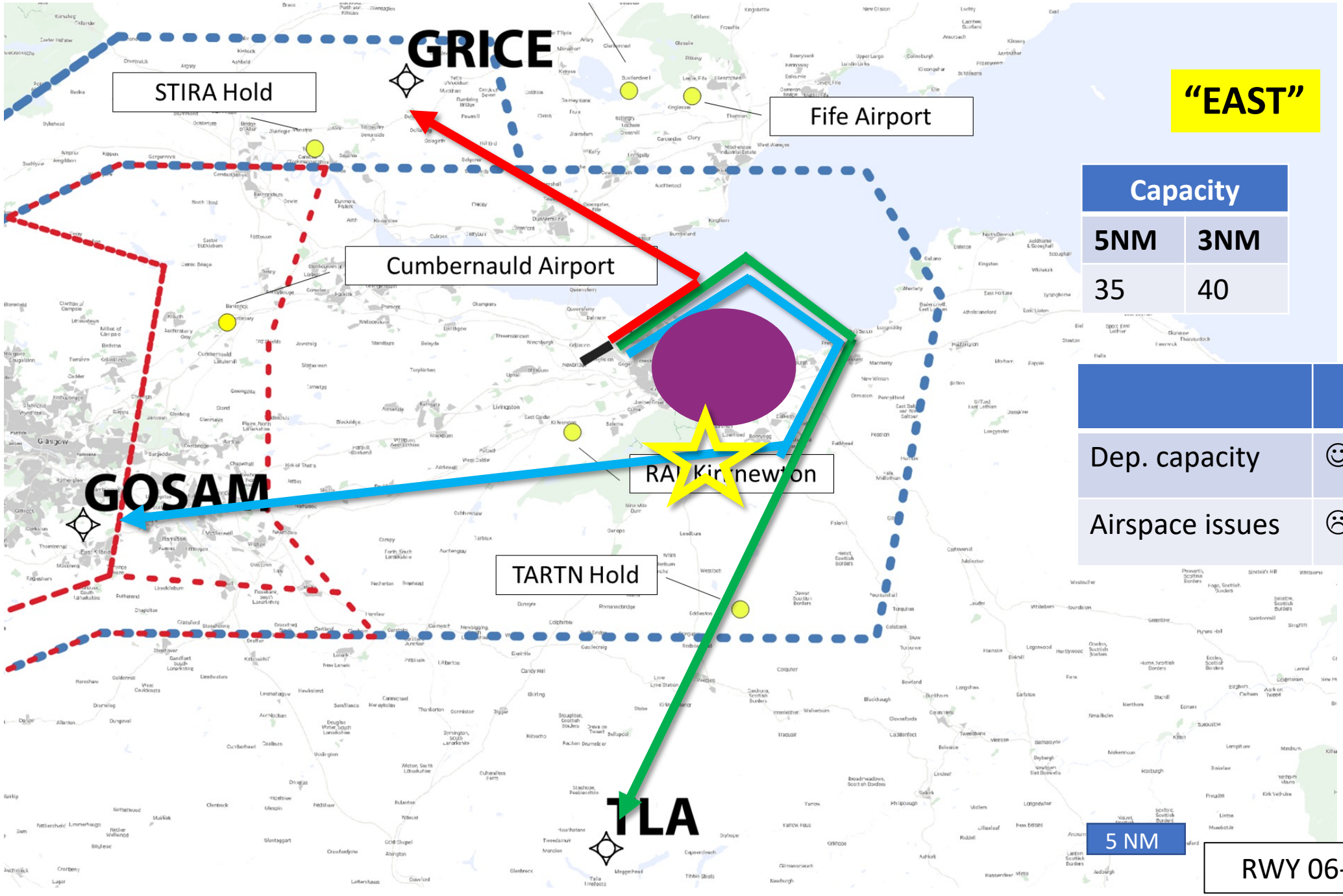
RWY 06-3xt-#2


GRICE
STIRA Hold
Fife Airport
"EAST"
Capacity*
5NM
3NM
42
49
Cumbernauld Airport
RAF Kirknewton
GOSAM
TARTN Hold
TLA
Dep. capacity
☺☺
Airspace issues
☺
5 NM
RWY 06-3xt-#3

RWY 06

3 exit points

GOSAM via South

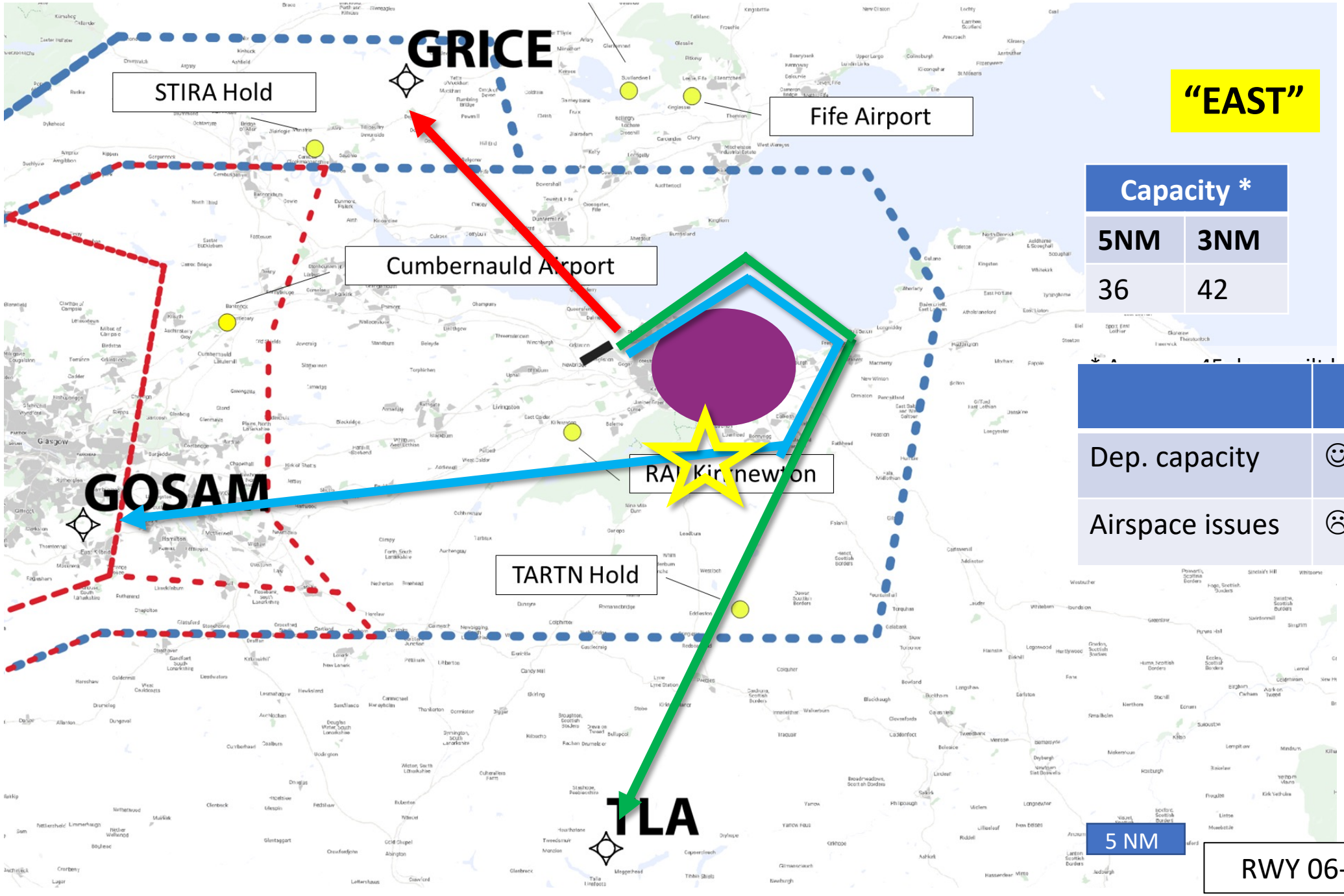


"EAST"

Capacity	
5NM	3NM
35	40

Dep. capacity	☺
Airspace issues	☹

RWY 06-3xt-#4



"EAST"

Capacity *	
5NM	**3NM**
36	42

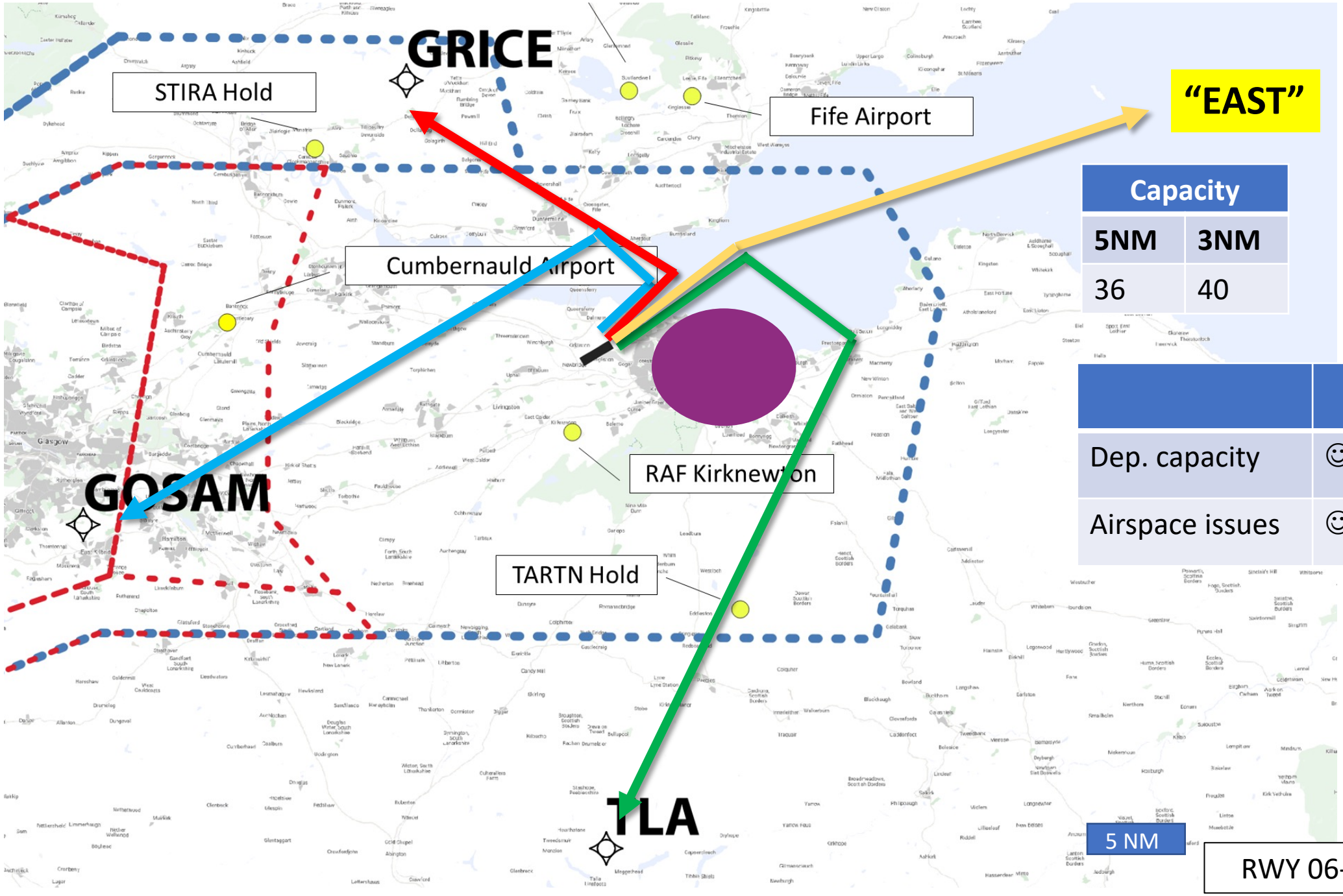
Dep. capacity	☺
Airspace issues	☹

RWY 06-3xt-#5

RWY 06

4 exit points

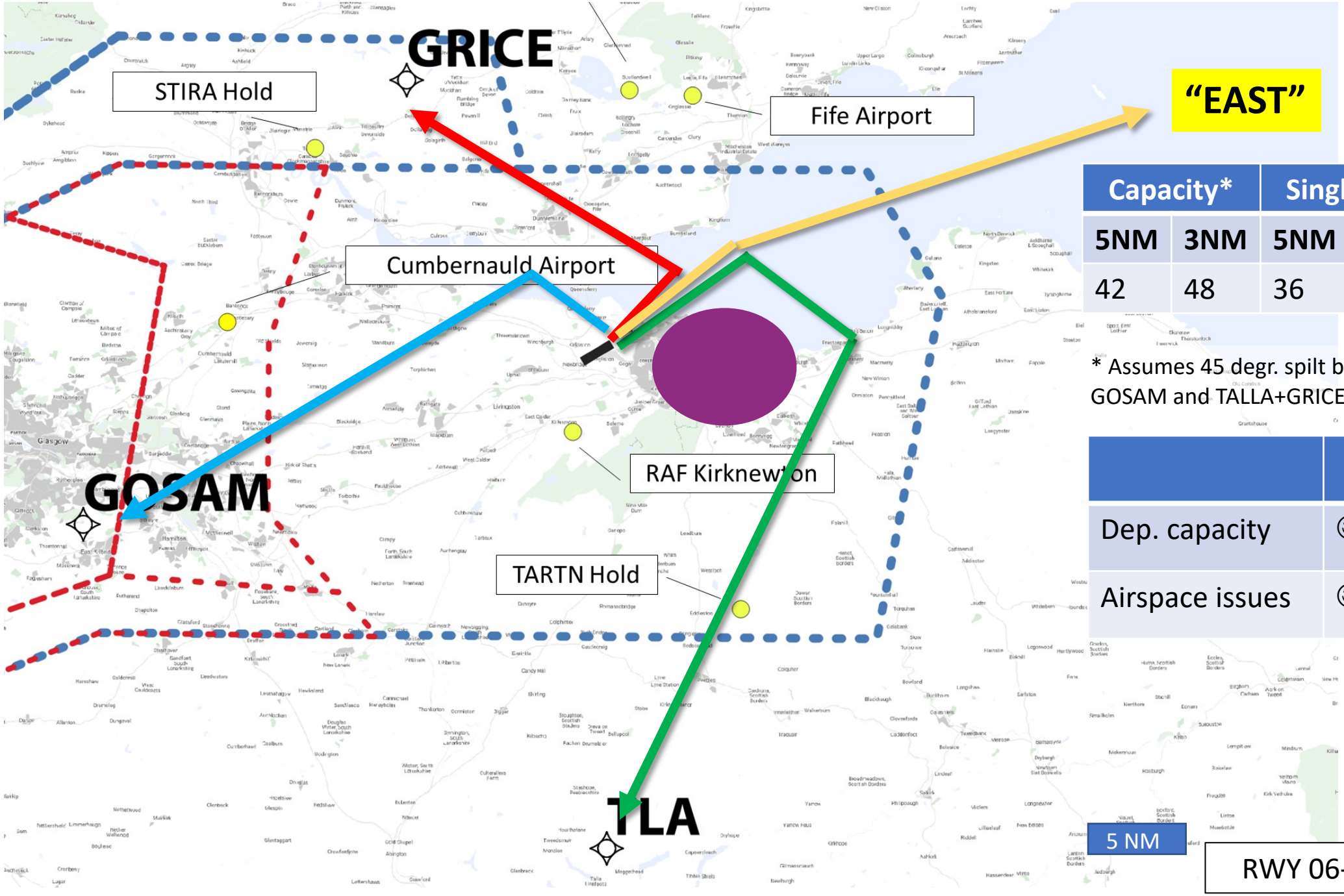
GOSAM via North



Capacity	
5NM	3NM
36	40

Dep. capacity	☺
Airspace issues	☺

RWY 06-4xt-#1

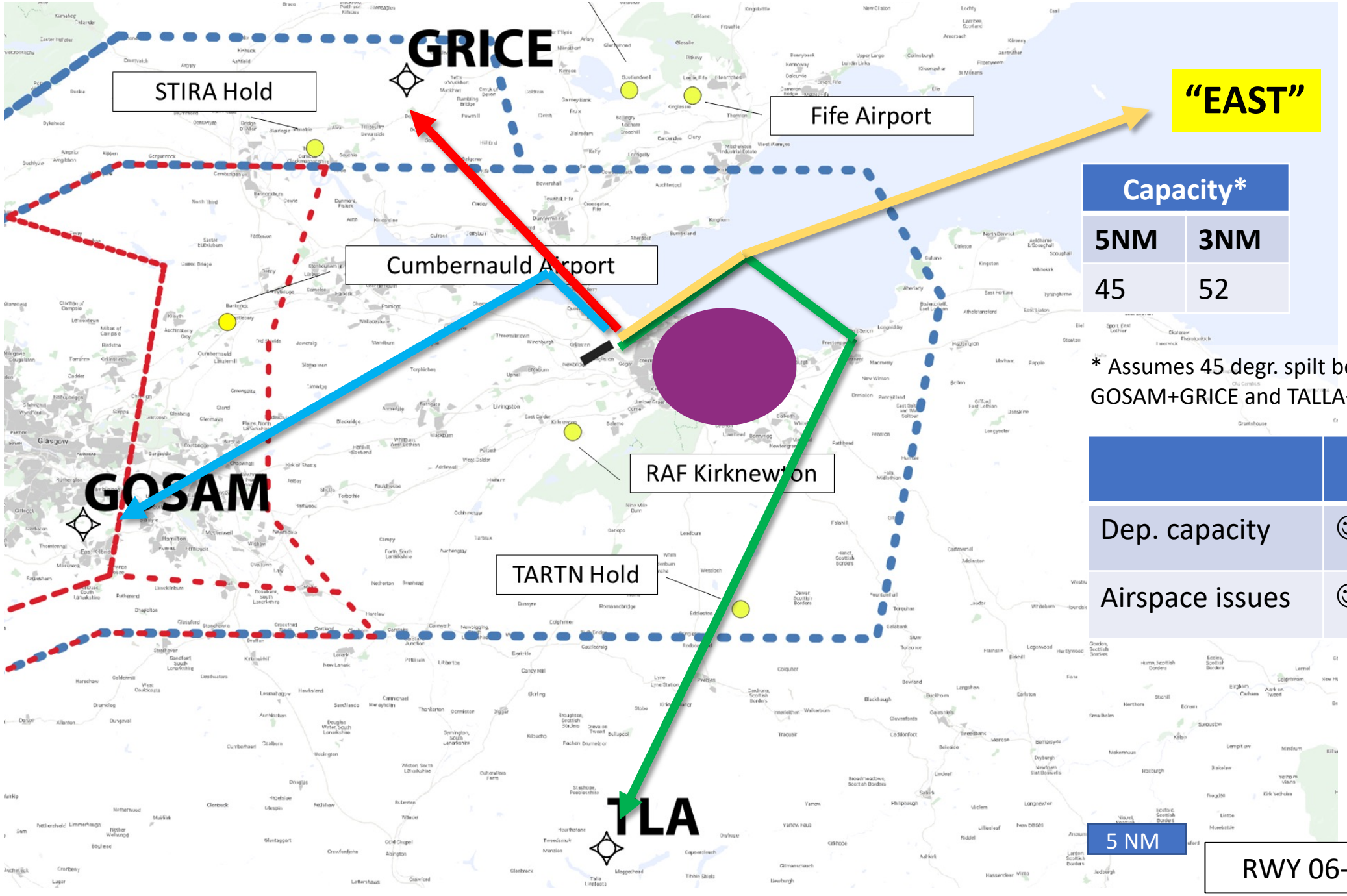


Capacity*		Single SID	
5NM	3NM	5NM	3NM
42	48	36	40

* Assumes 45 degr. spilt between GOSAM and TALLA+GRICE+EAST

Dep. capacity	☺(☺)
Airspace issues	☺

RWY 06-4xt-#2



Capacity*	
5NM	3NM
45	52

* Assumes 45 degr. spilt between GOSAM+GRICE and TALLA+EAST

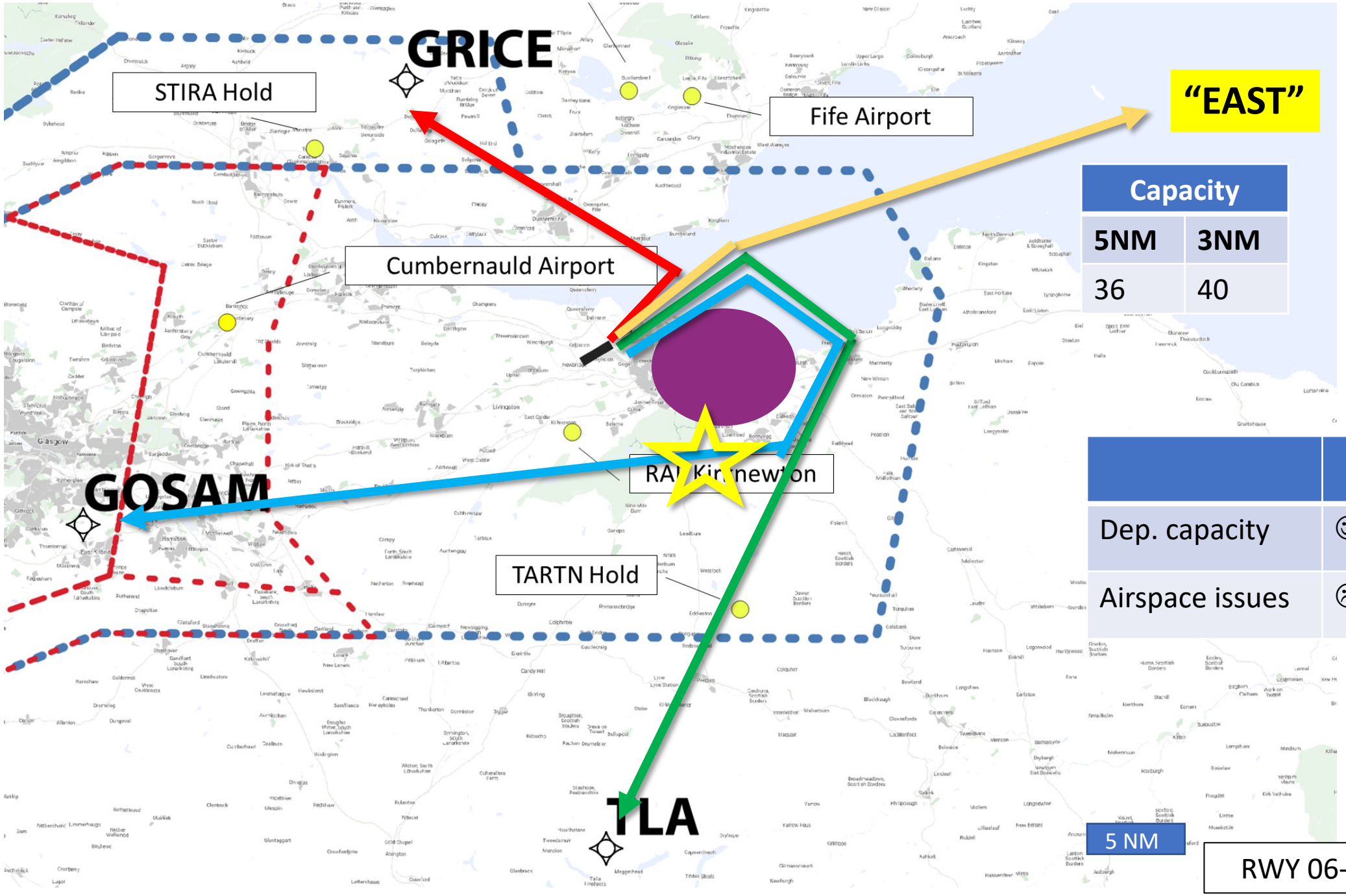
Dep. capacity	☺☺☺
Airspace issues	☺

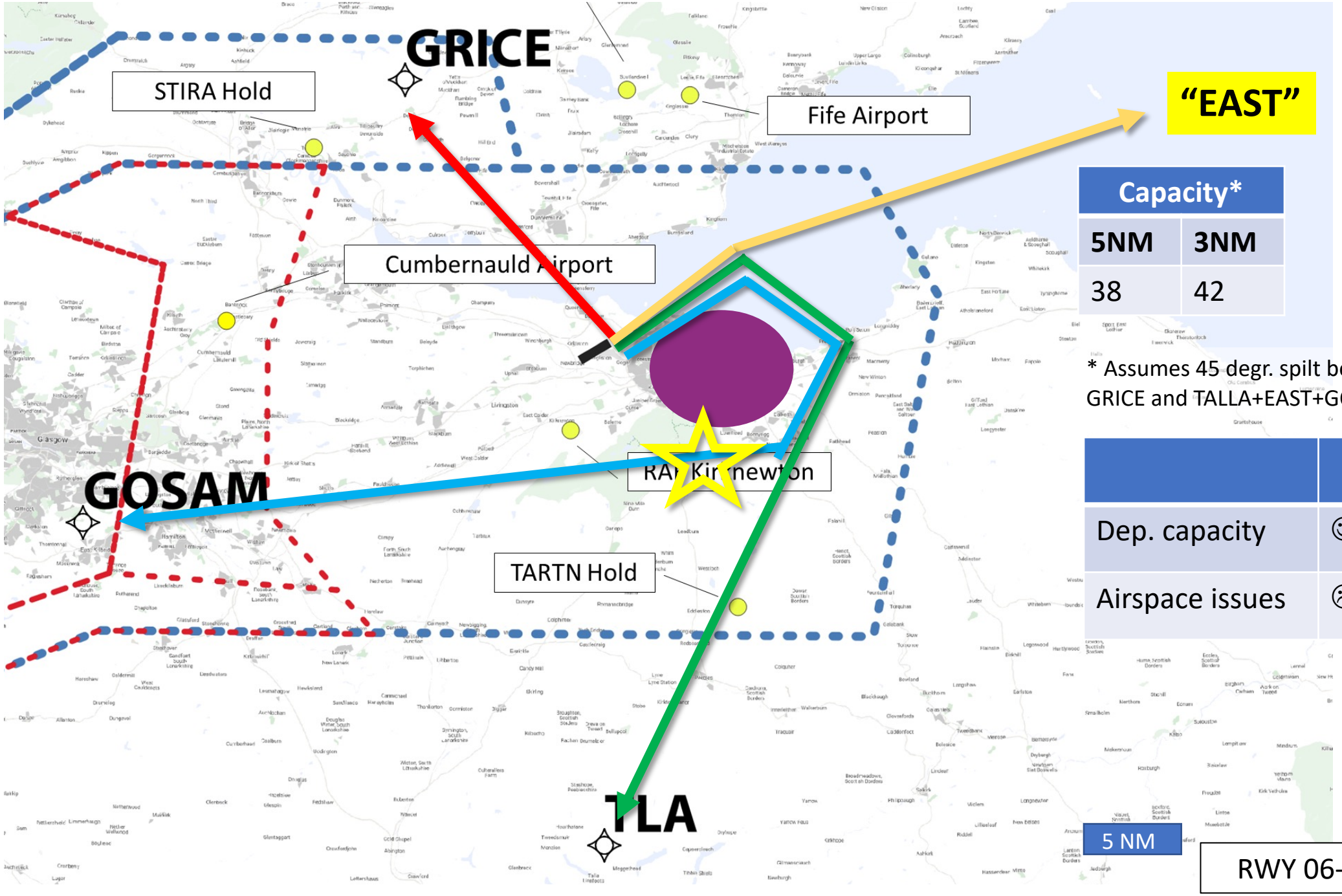
RWY 06-4xt-#3

RWY 06

4 exit points

GOSAM via South


GRICE
STIRA Hold
Fife Airport
"EAST"
Cumbernauld Airport
Capacity
5NM
3NM
36
40
RAF Kinnewton
GOSAM
TARTN Hold
Dep. capacity
☺
Airspace issues
☹
TLA
5 NM
RWY 06-4xt-#4

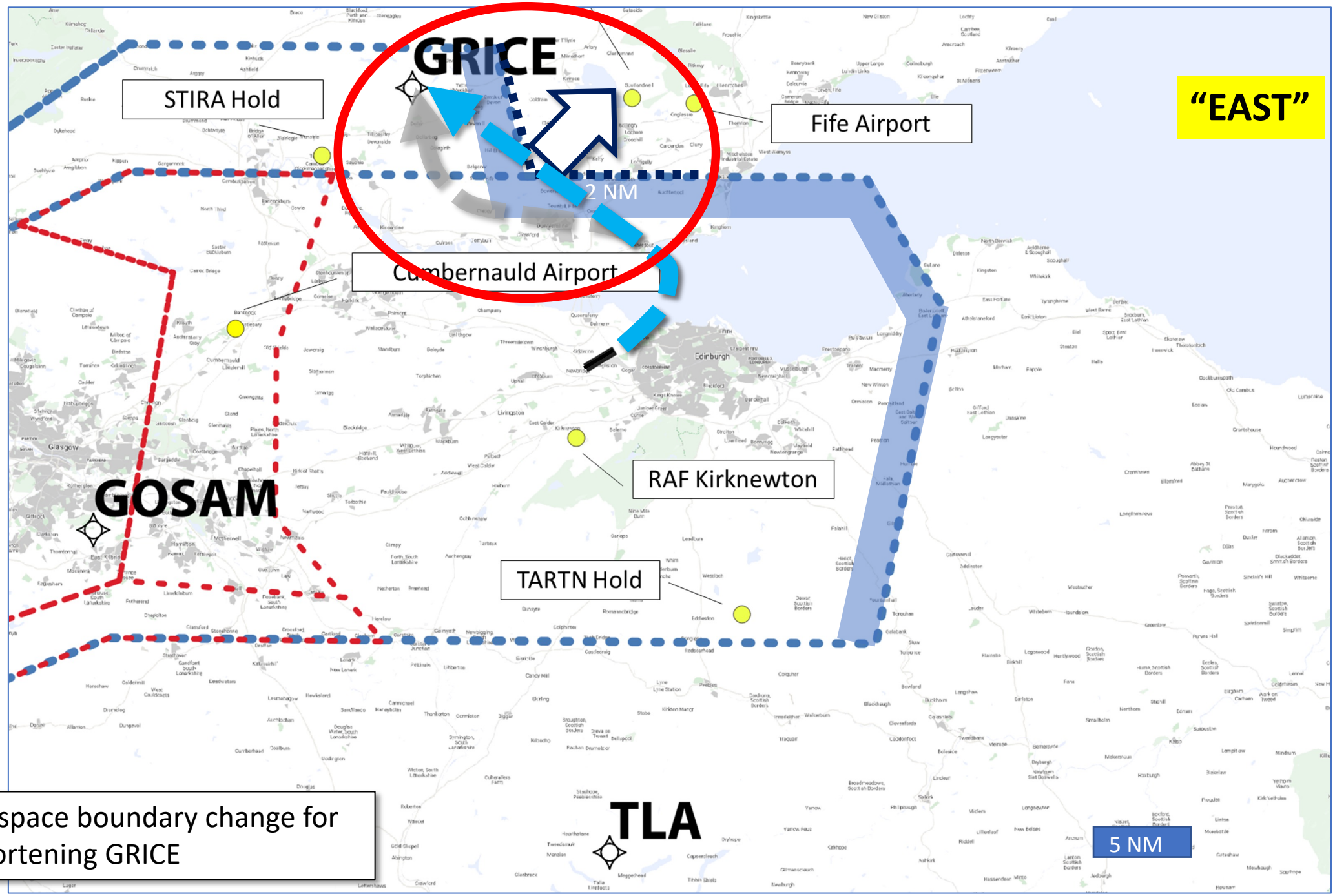


Capacity*	
5NM	3NM
38	42

* Assumes 45 degr. spilt between GRICE and TALLA+EAST+GOSAM

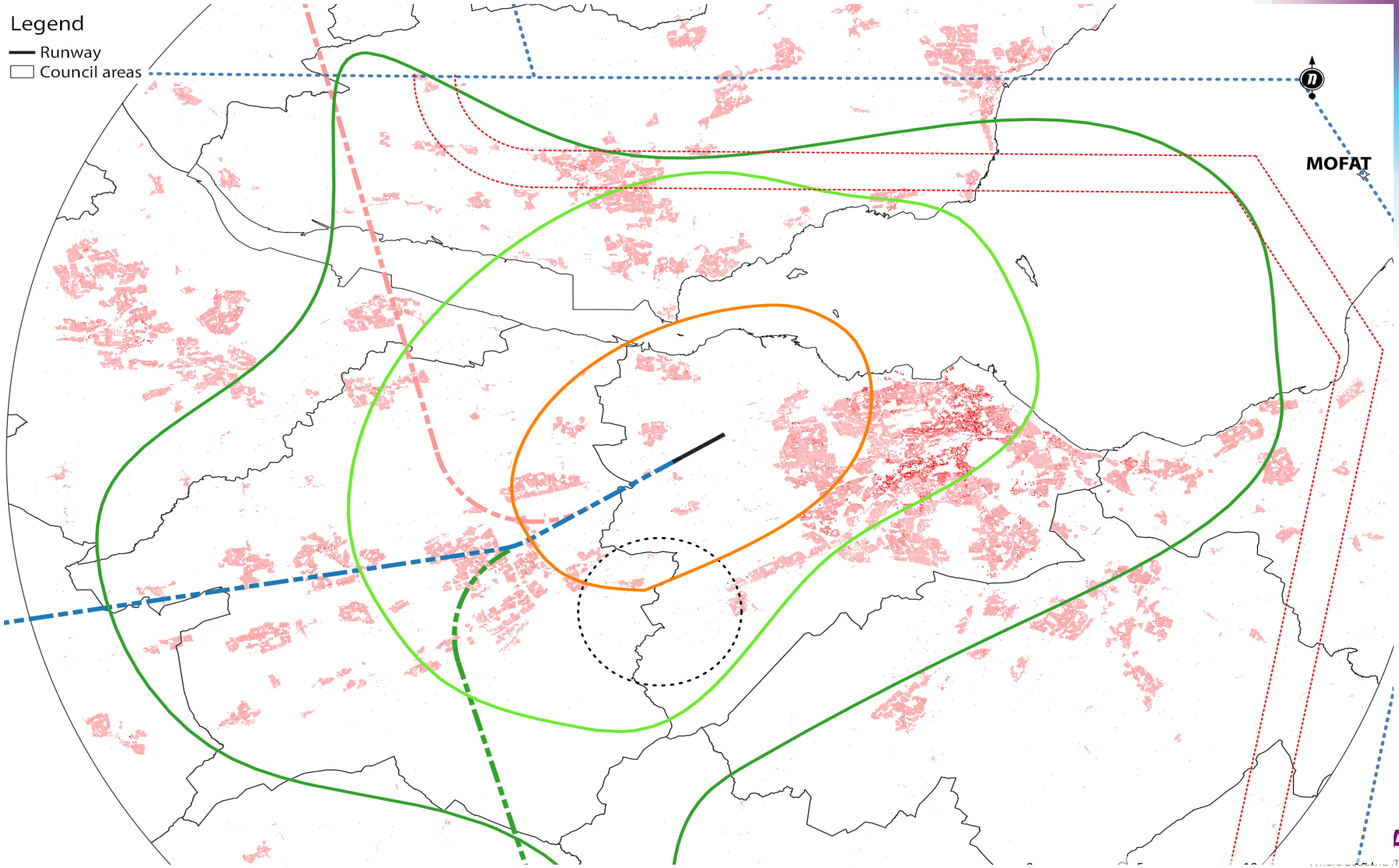
Dep. capacity	☺
Airspace issues	☹

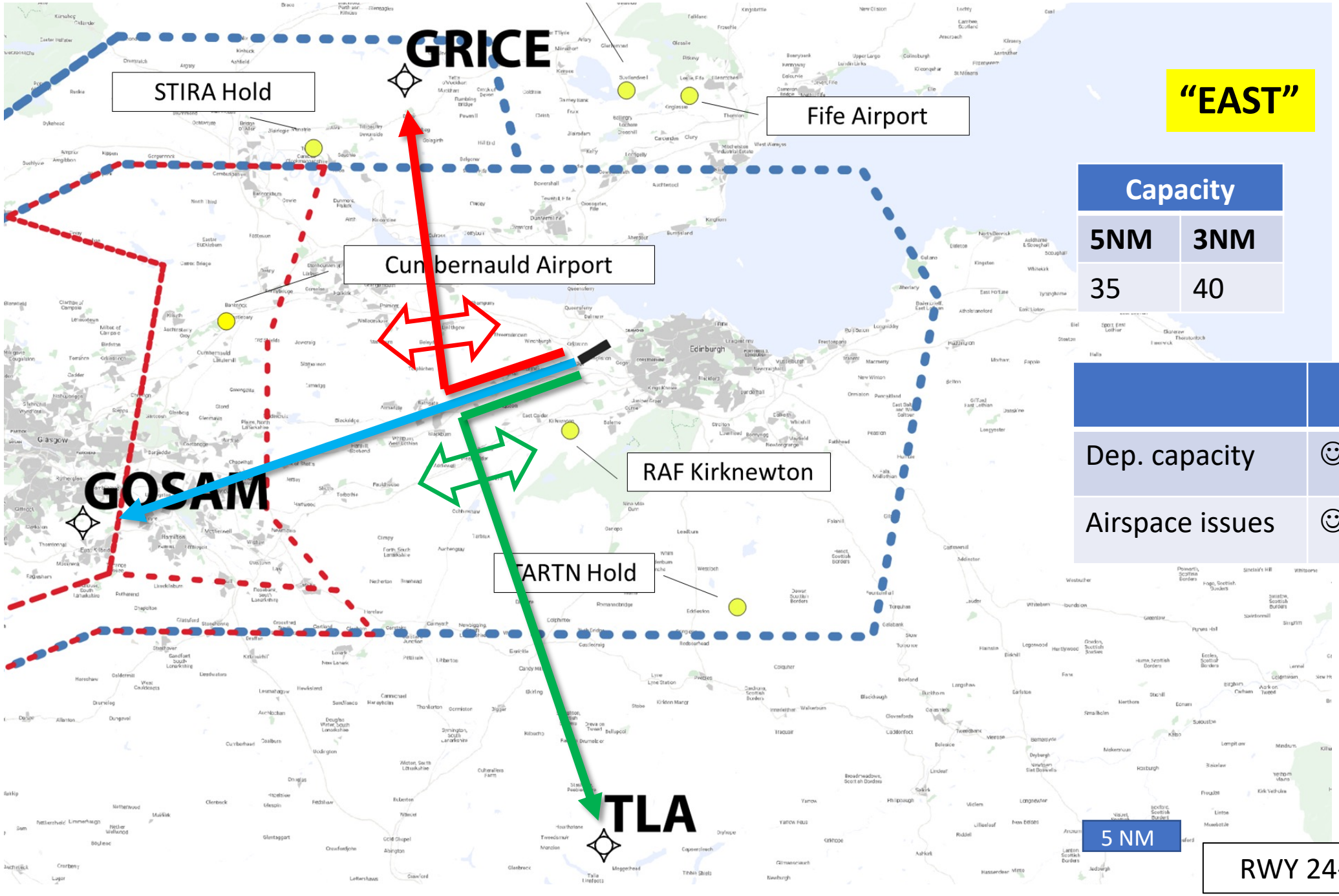
RWY 06-4xt-#5

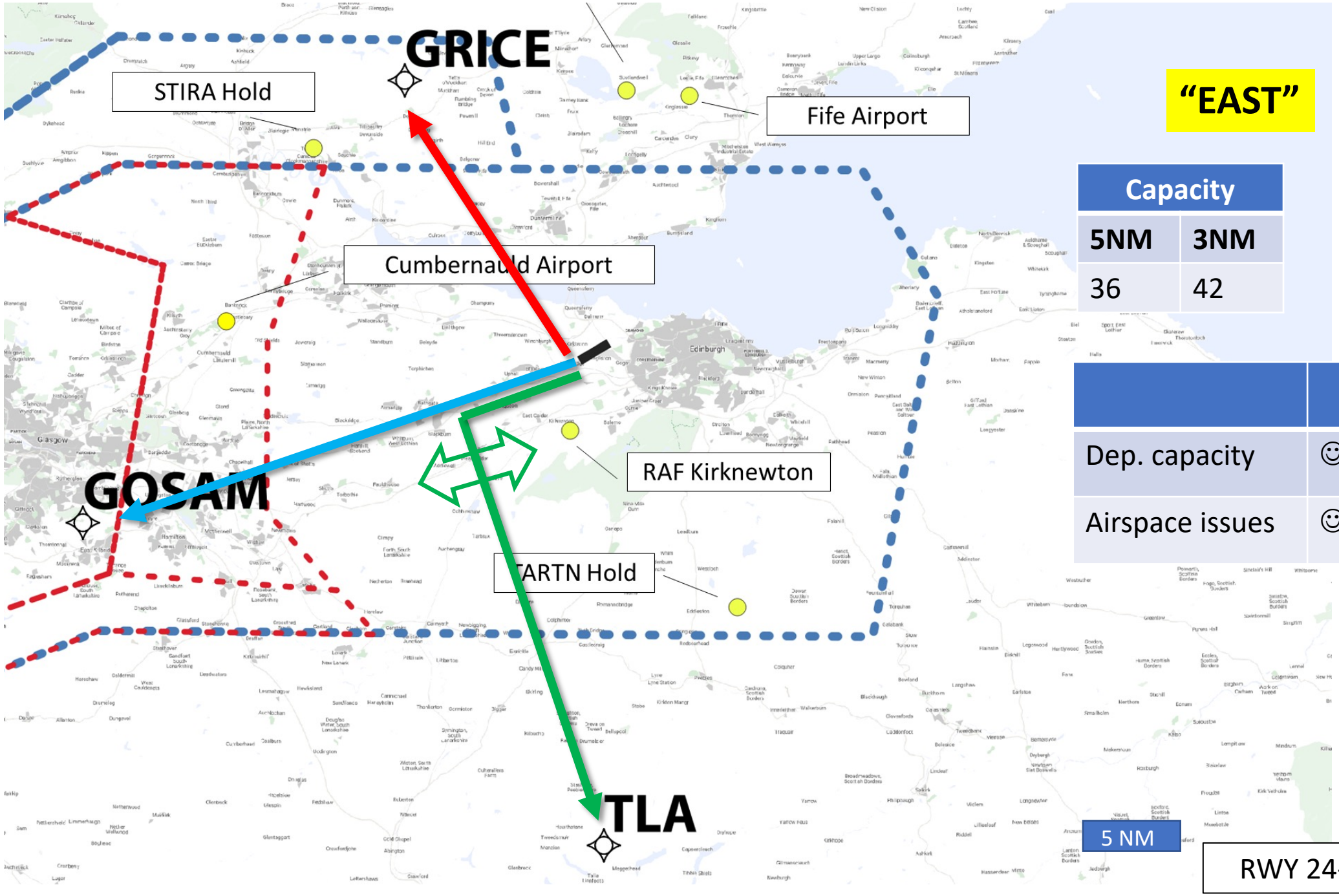


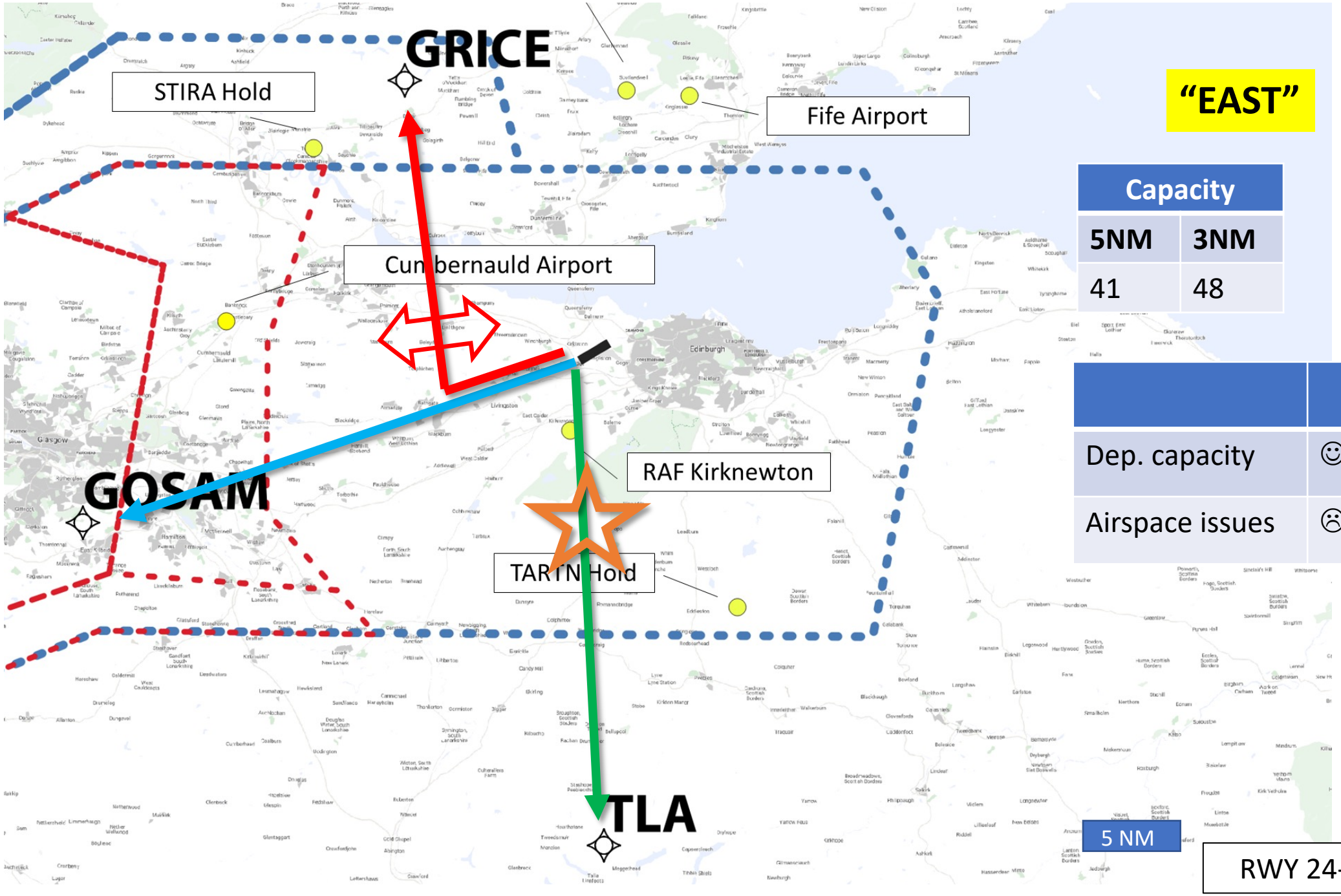
Airspace boundary change for shortening GRICE

RWY 24
3 exit points
(TALLA via South)


Legend
Runway
Council areas
MOFAT


GRICE
STIRA Hold
Fife Airport
"EAST"
Capacity
5NM
3NM
35
40
Cumbernauld Airport
Edinburgh
Glasgow
RAF Kirknewton
GOSAM
TARTN Hold
TLA
Dep. capacity ☺
Airspace issues ☺
5 NM
RWY 24-3xt-#1


GRICE
STIRA Hold
Fife Airport
"EAST"
Capacity
5NM
3NM
36
42
Cumbernauld Airport
Edinburgh
RAF Kirknewton
GOSAM
TARTN Hold
TLA
Dep. capacity
Airspace issues
5 NM
RWY 24-3xt-#2

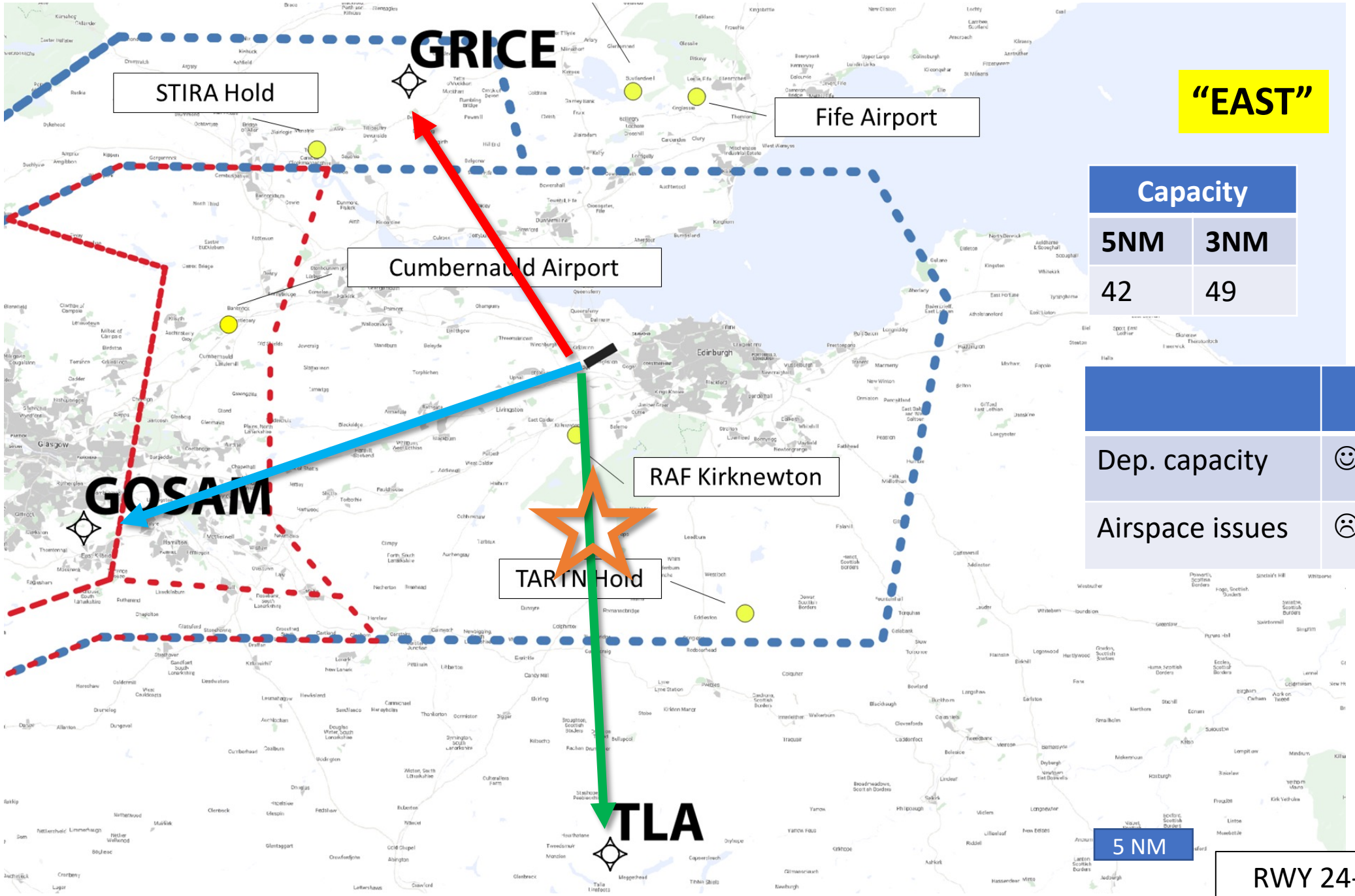


"EAST"

Capacity	
5NM	**3NM**
41	48

Dep. capacity	☺☺
Airspace issues	☹

RWY 24-3xt-#3



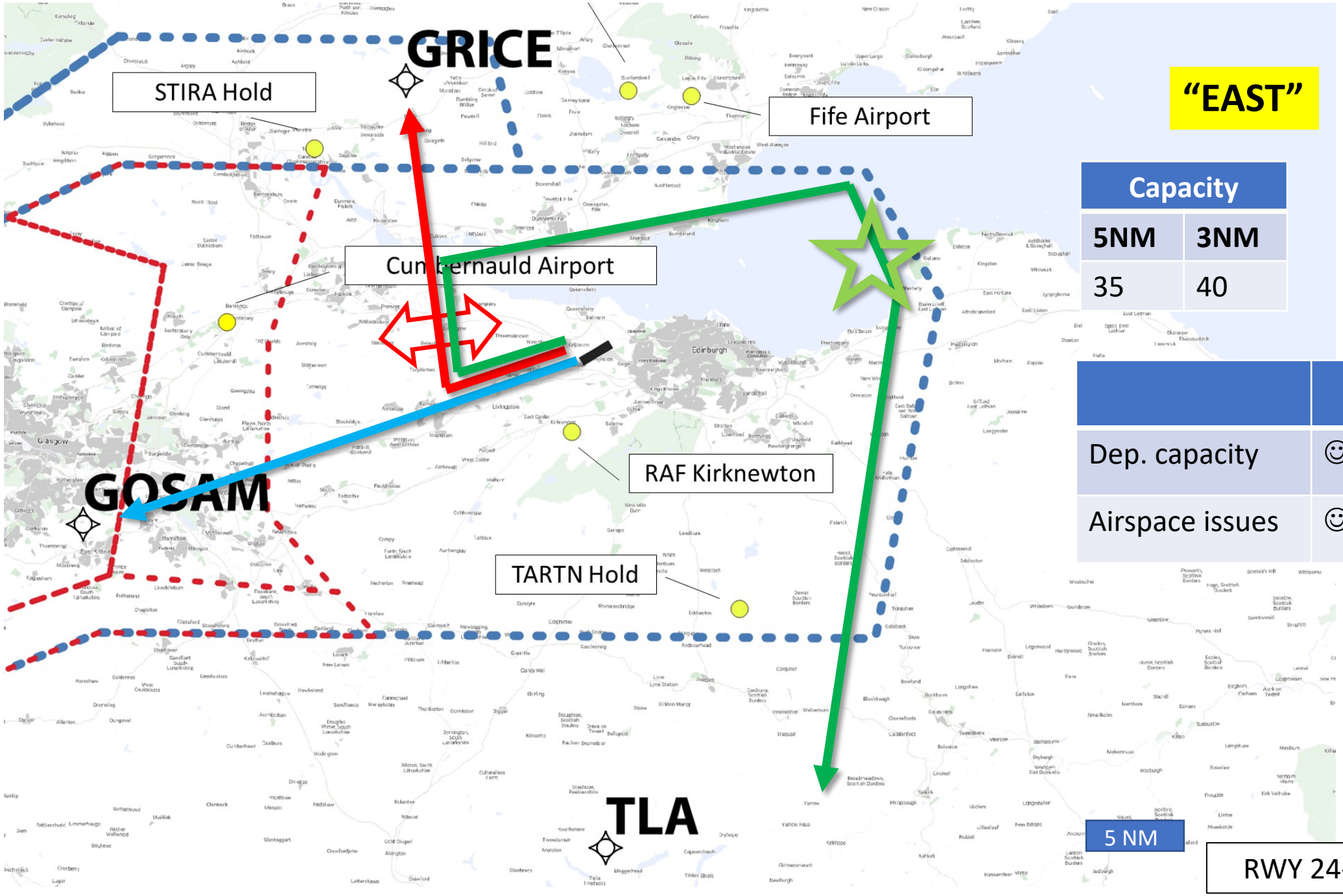
"EAST"

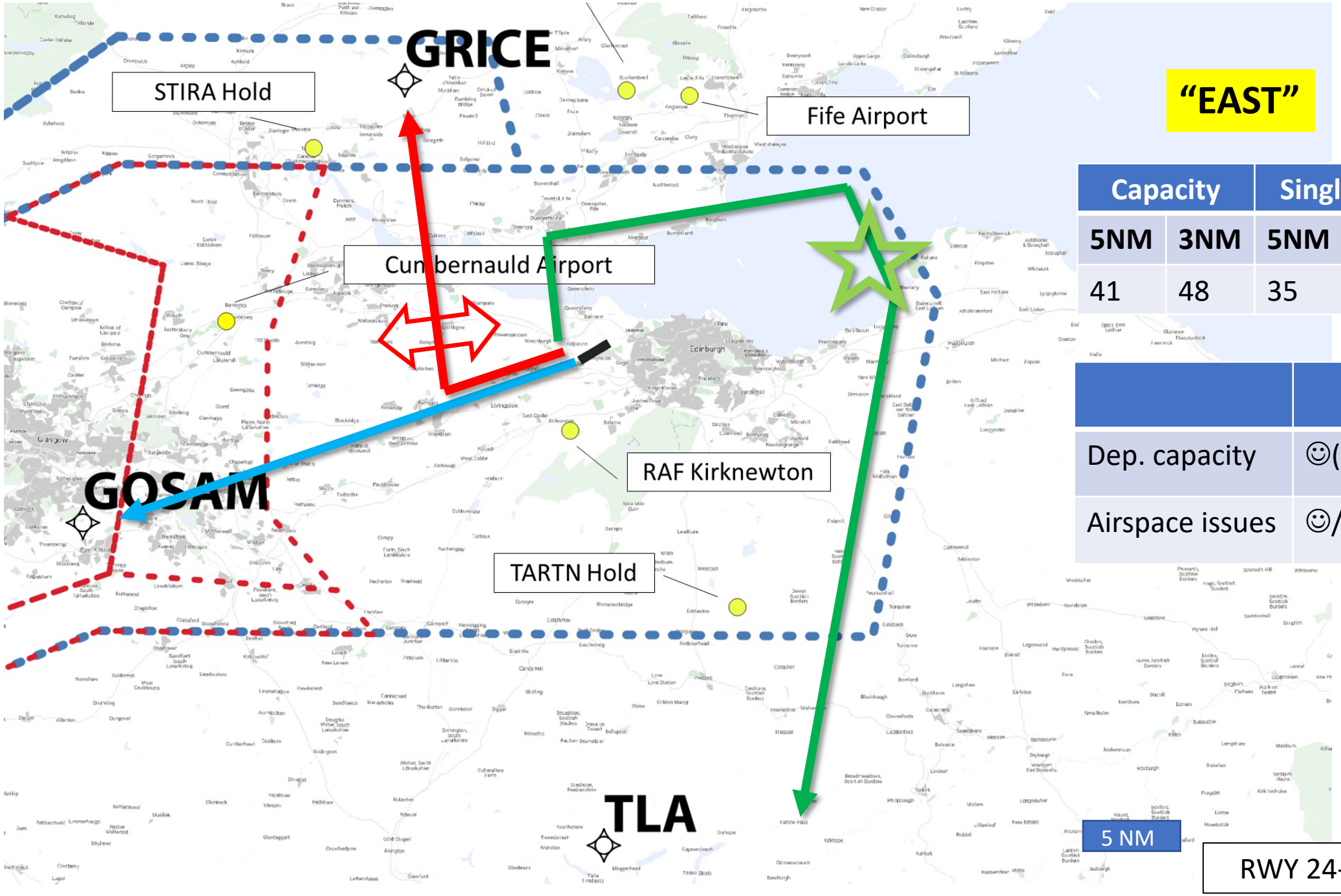
Capacity	
5NM	3NM
42	49

Dep. capacity	☺☺
Airspace issues	☹

RWY 24-3xt-#4

RWY 24
3 exit points
(TALLA via North)


GRICE
STIRA Hold
Fife Airport
"EAST"
Capacity
5NM
3NM
35
40
Cumbernauld Airport
Edinburgh
Livingston
RAF Kirknewton
GOSAM
TARTN Hold
TLA
Dep. capacity
☺
Airspace issues
☺/😐
5 NM
RWY 24-3xt-#5

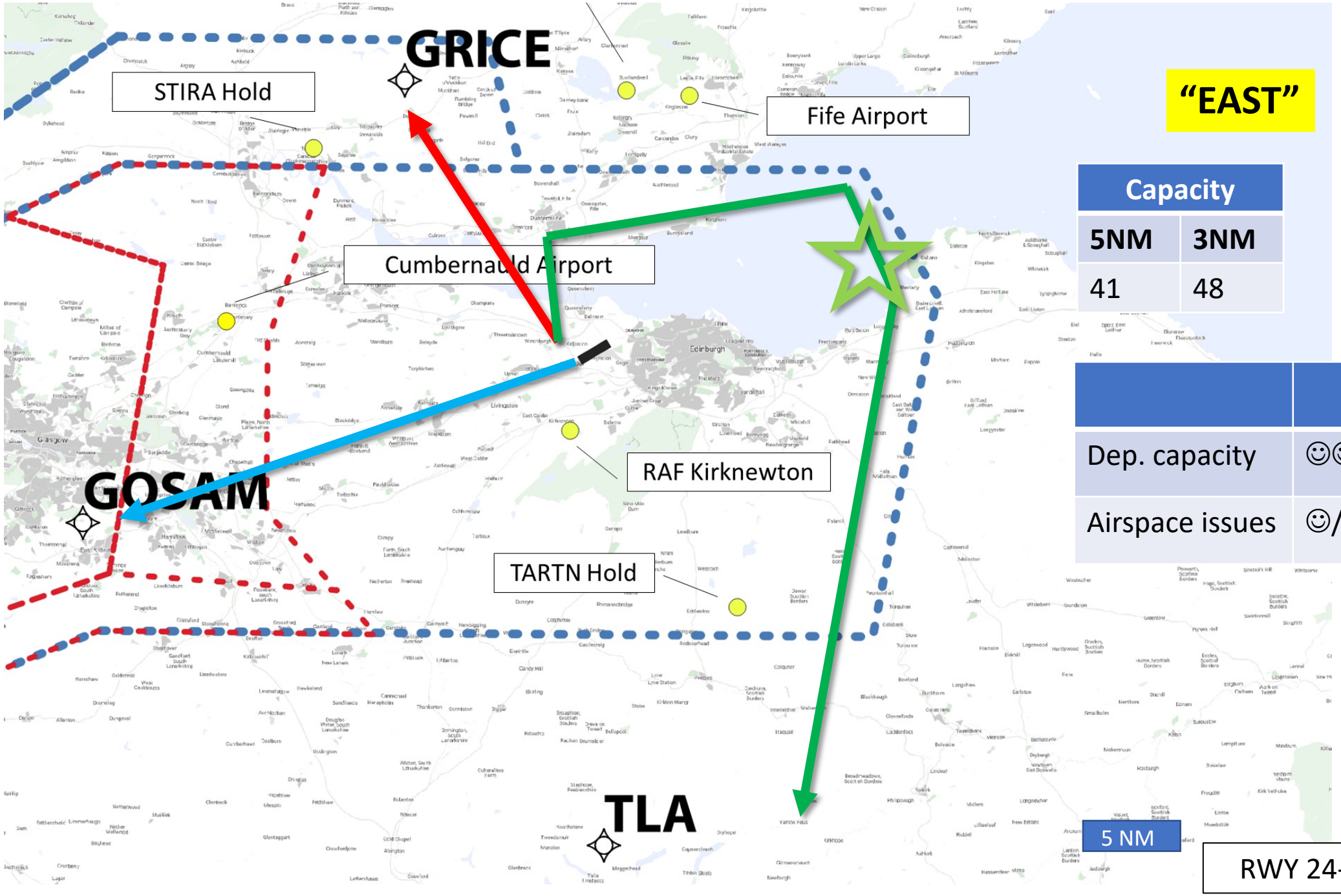


"EAST"

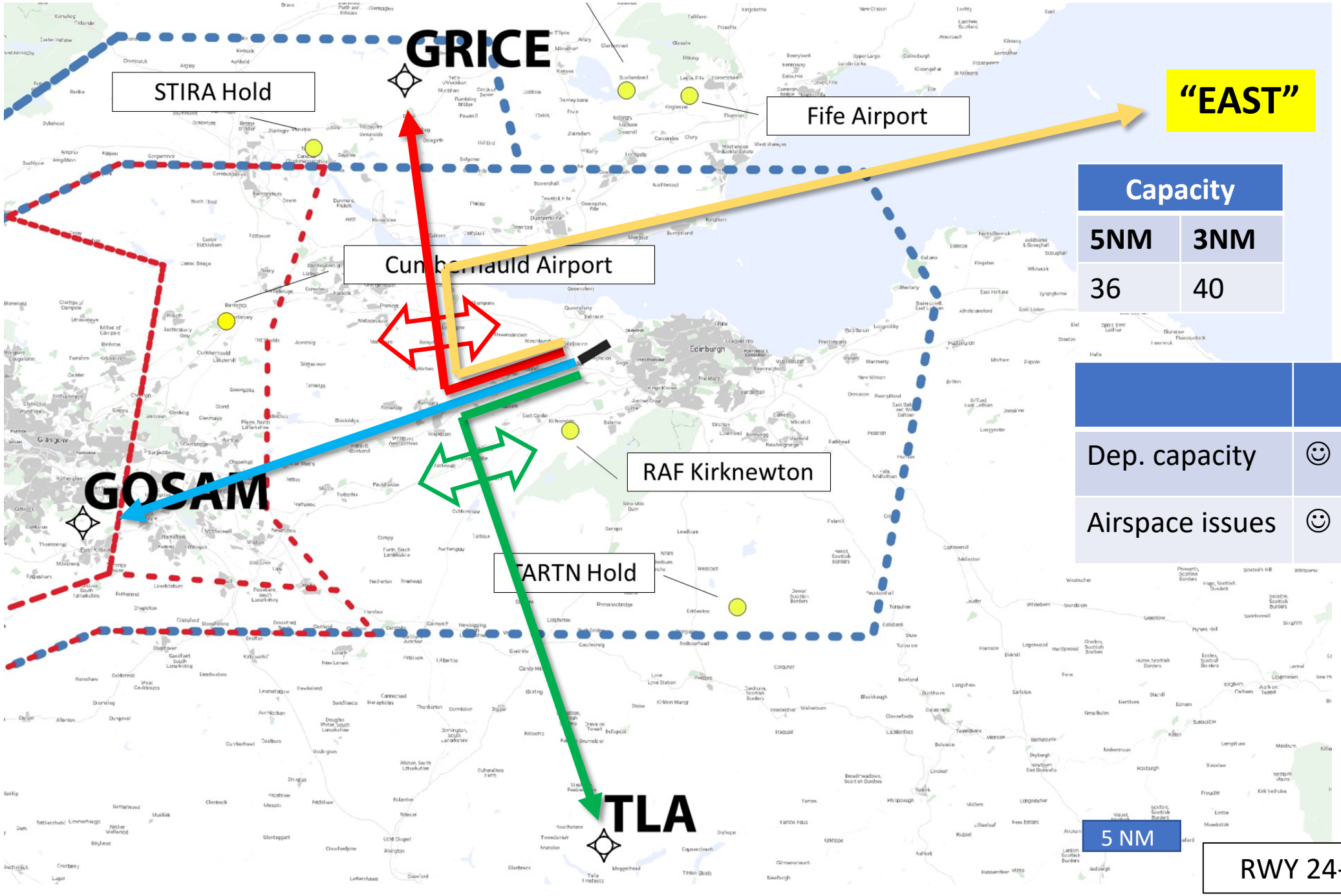
Capacity		Single SID	
5NM	3NM	5NM	3NM
41	48	35	40

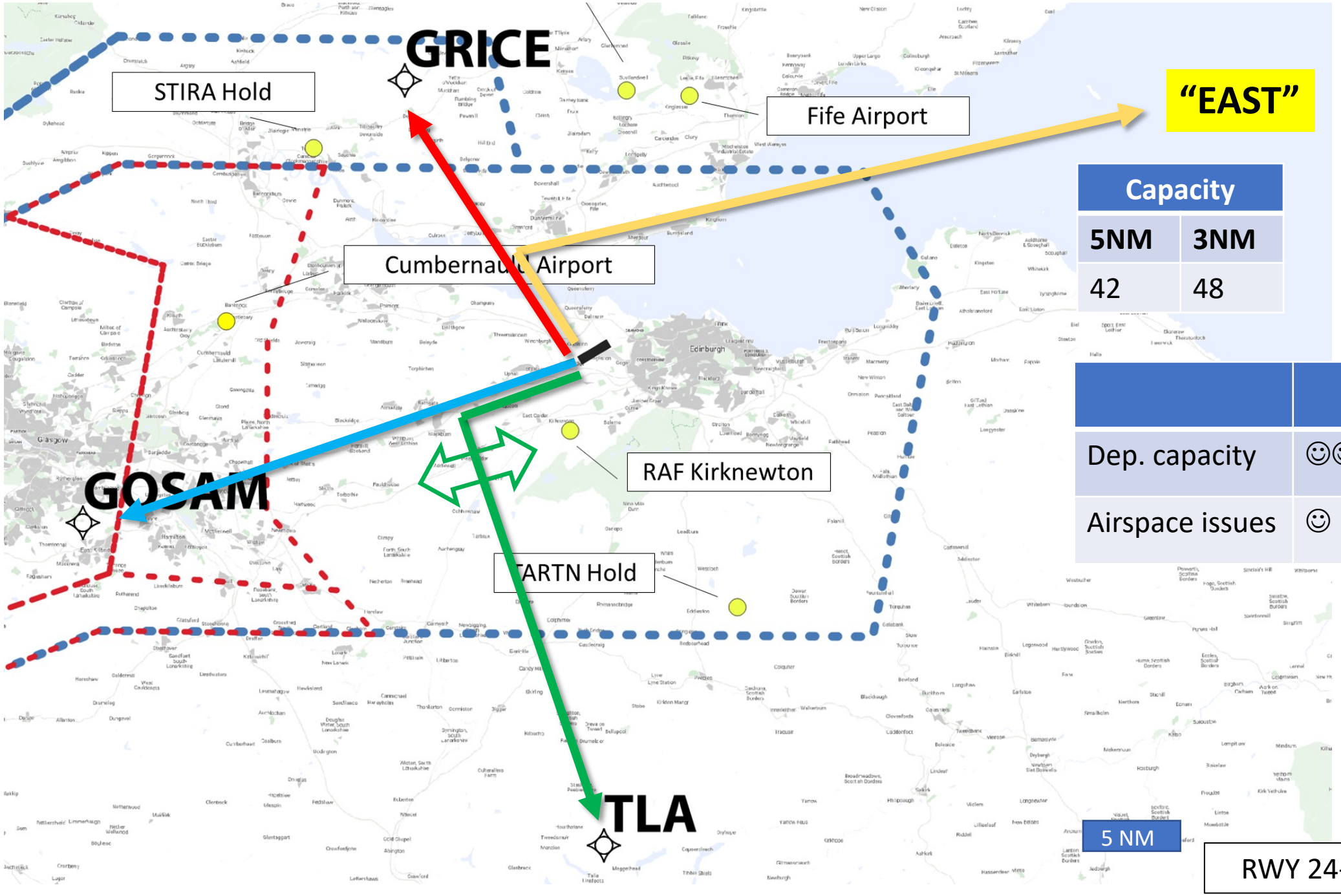
Dep. capacity	☺(☺)
Airspace issues	☺/😐

RWY 24-3xt-#6


GRICE
STIRA Hold
Fife Airport
"EAST"
Capacity
5NM
3NM
41
48
Cumbernauld Airport
Edinburgh
RAF Kirknewton
GOSAM
TARTN Hold
TLA
Dep. capacity
☺☺
Airspace issues
☺/😐
5 NM
RWY 24-3xt-#7

RWY 24
4 exit points
“EAST”via north

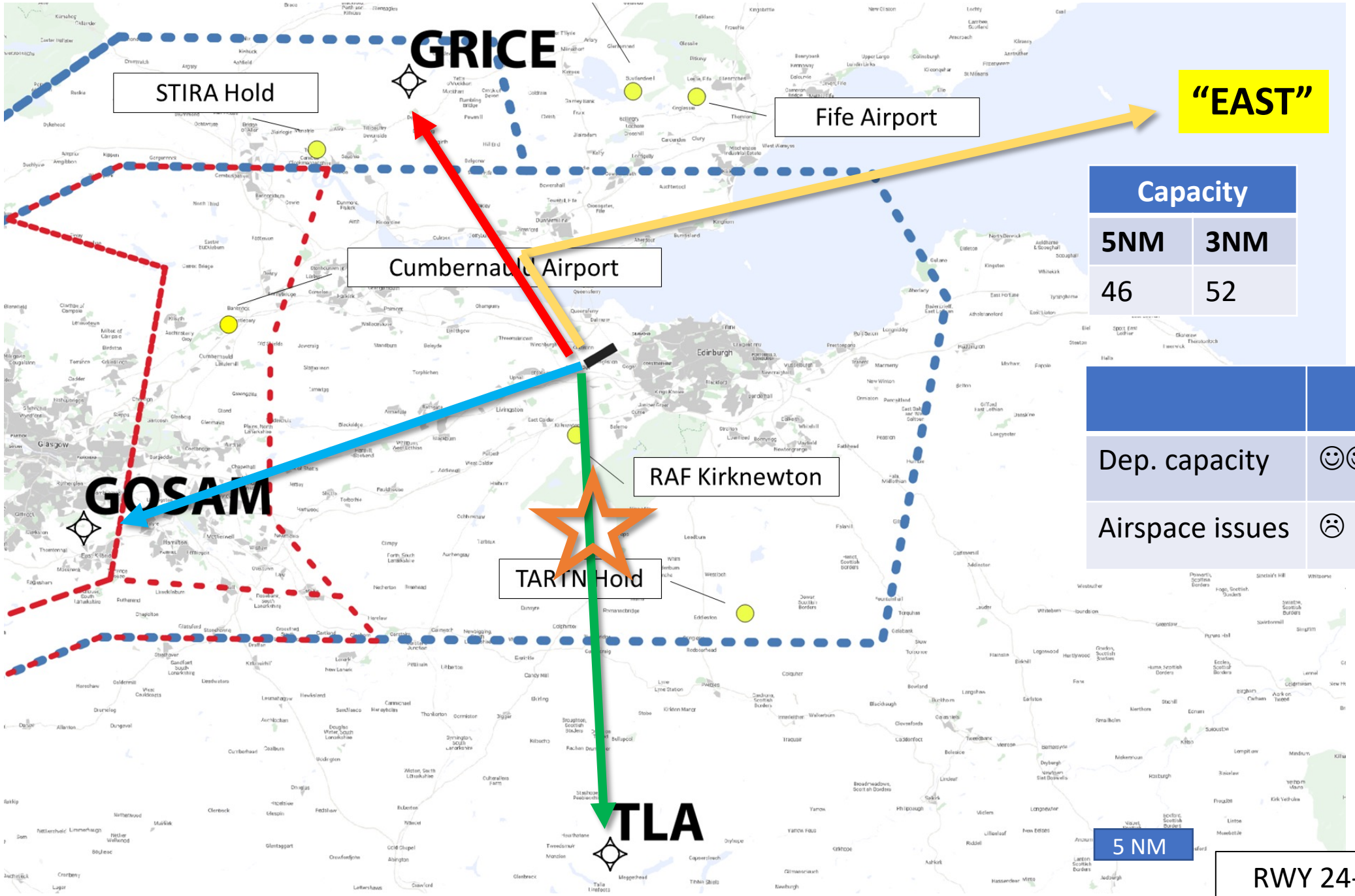

GRICE
STIRA Hold
Fife Airport
"EAST"
Capacity
5NM
3NM
36
40
Cumbernauld Airport
Edinburgh
RAF Kirknewton
GOSAM
TARTN Hold
TLA
Dep. capacity
☺
Airspace issues
☺
5 NM
RWY 24-4xt-#1



Capacity	
5NM	3NM
42	48

Dep. capacity	☺☺
Airspace issues	☺

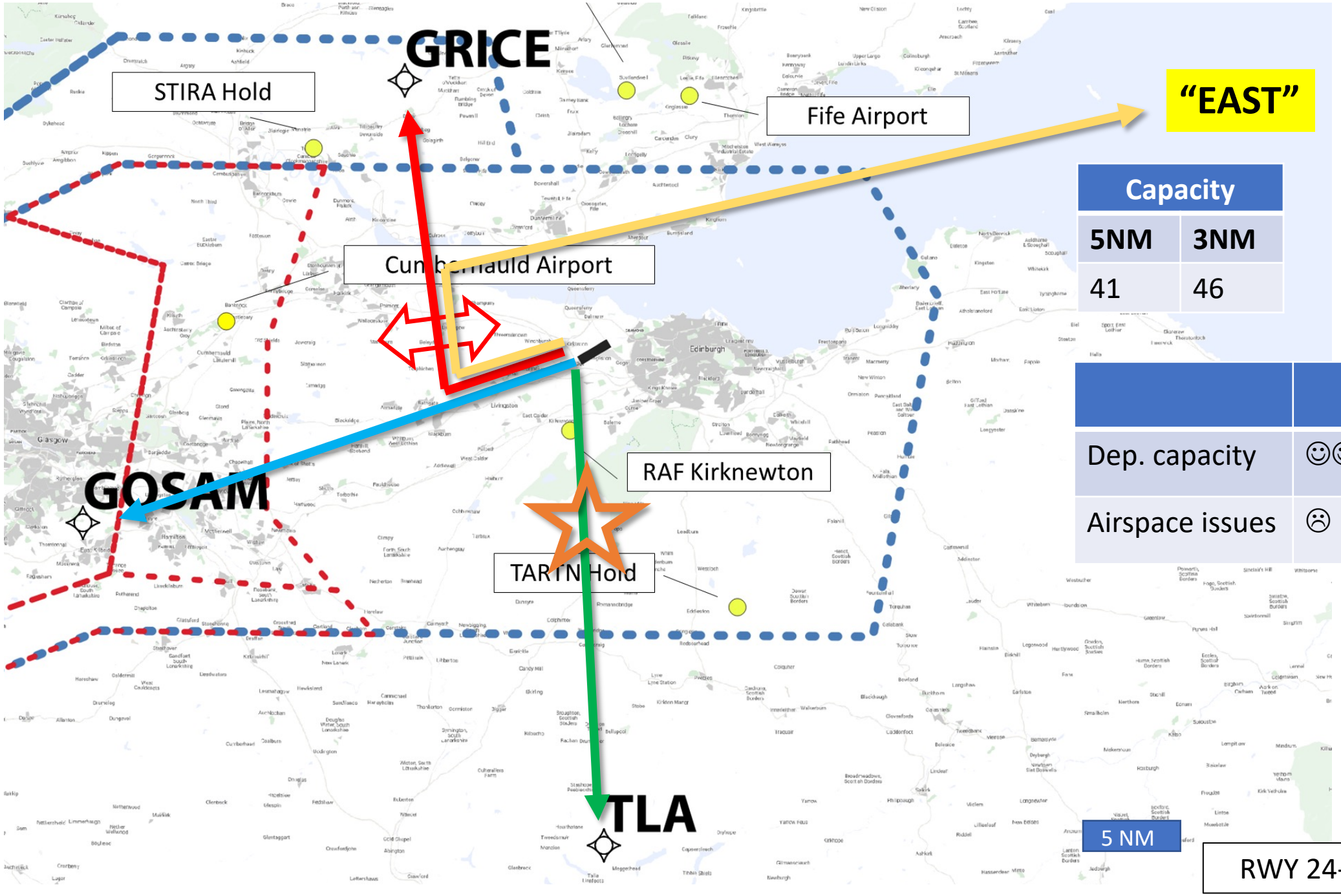
RWY 24-4xt-#2

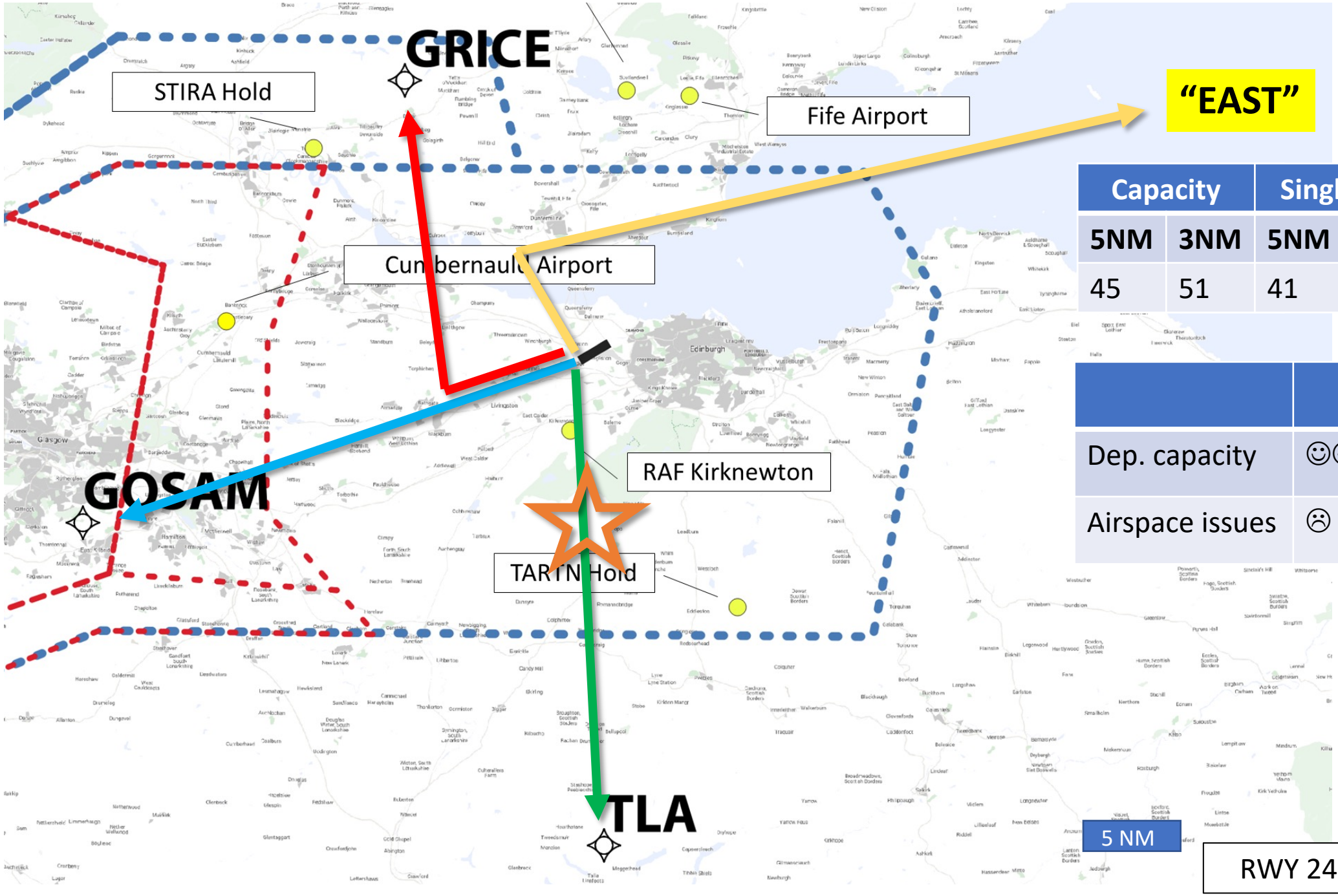


Capacity	
5NM	3NM
46	52

Dep. capacity	☺☺☺
Airspace issues	☹

RWY 24-4xt-#3

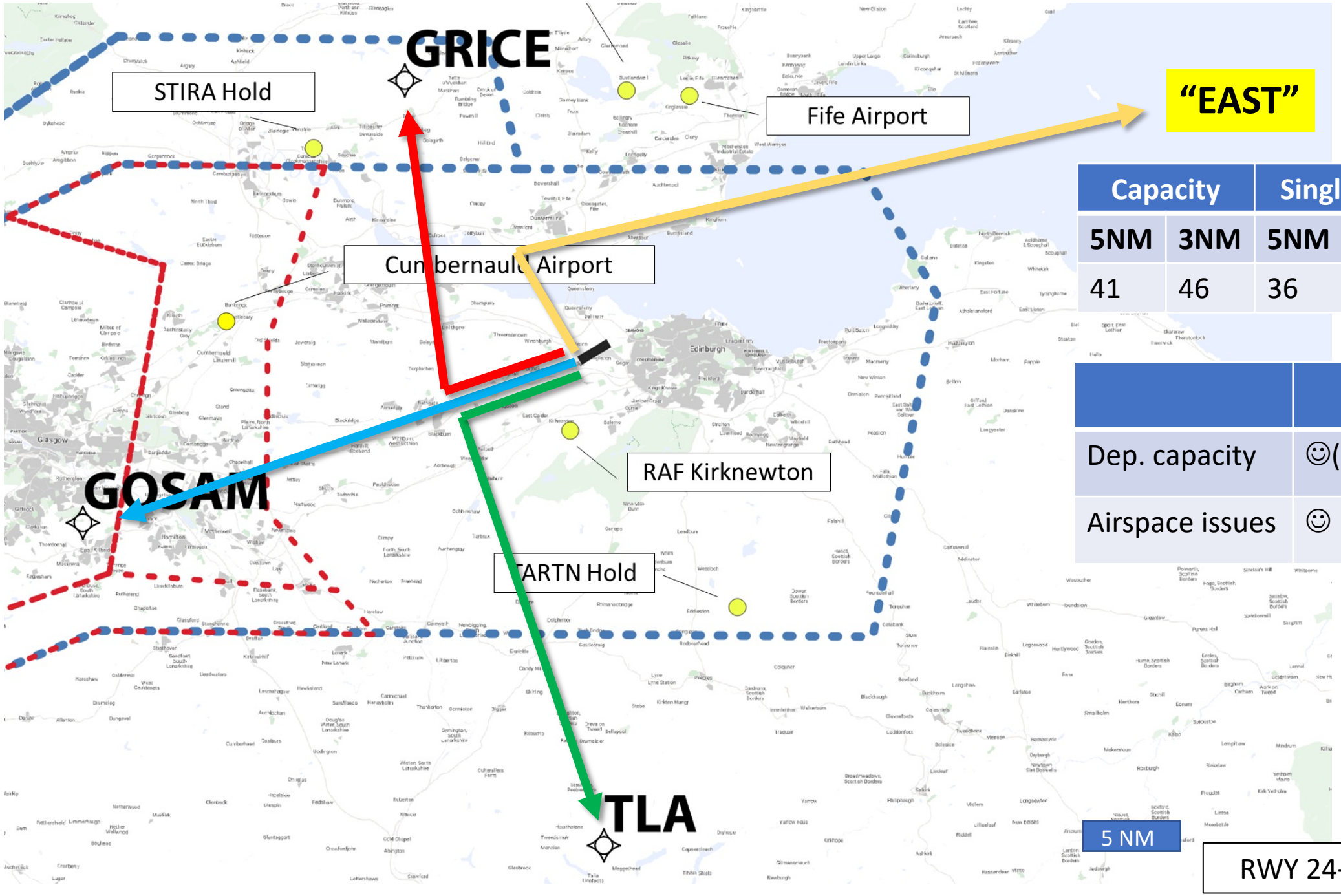

GRICE
STIRA Hold
Fife Airport
"EAST"
Capacity
5NM
3NM
41
46
Cumbernauld Airport
Edinburgh
RAF Kirknewton
GOSAM
TARTN Hold
TLA
Dep. capacity
☺☺
Airspace issues
☹
5 NM
RWY 24-4xt-#4



Capacity		Single SID	
5NM	3NM	5NM	3NM
45	51	41	46

Dep. capacity	☺☺(☺)
Airspace issues	☹

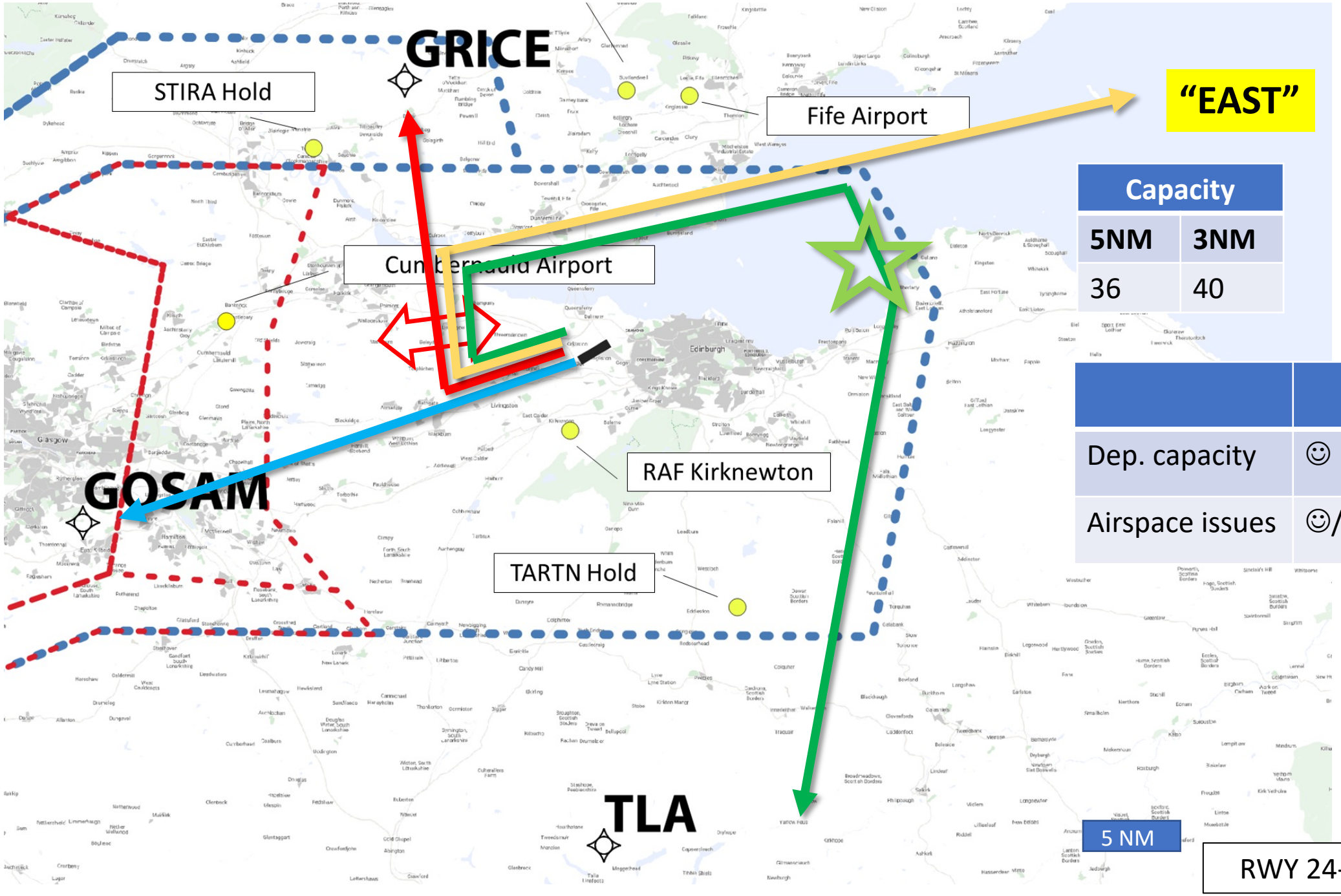
RWY 24-4xt-#5

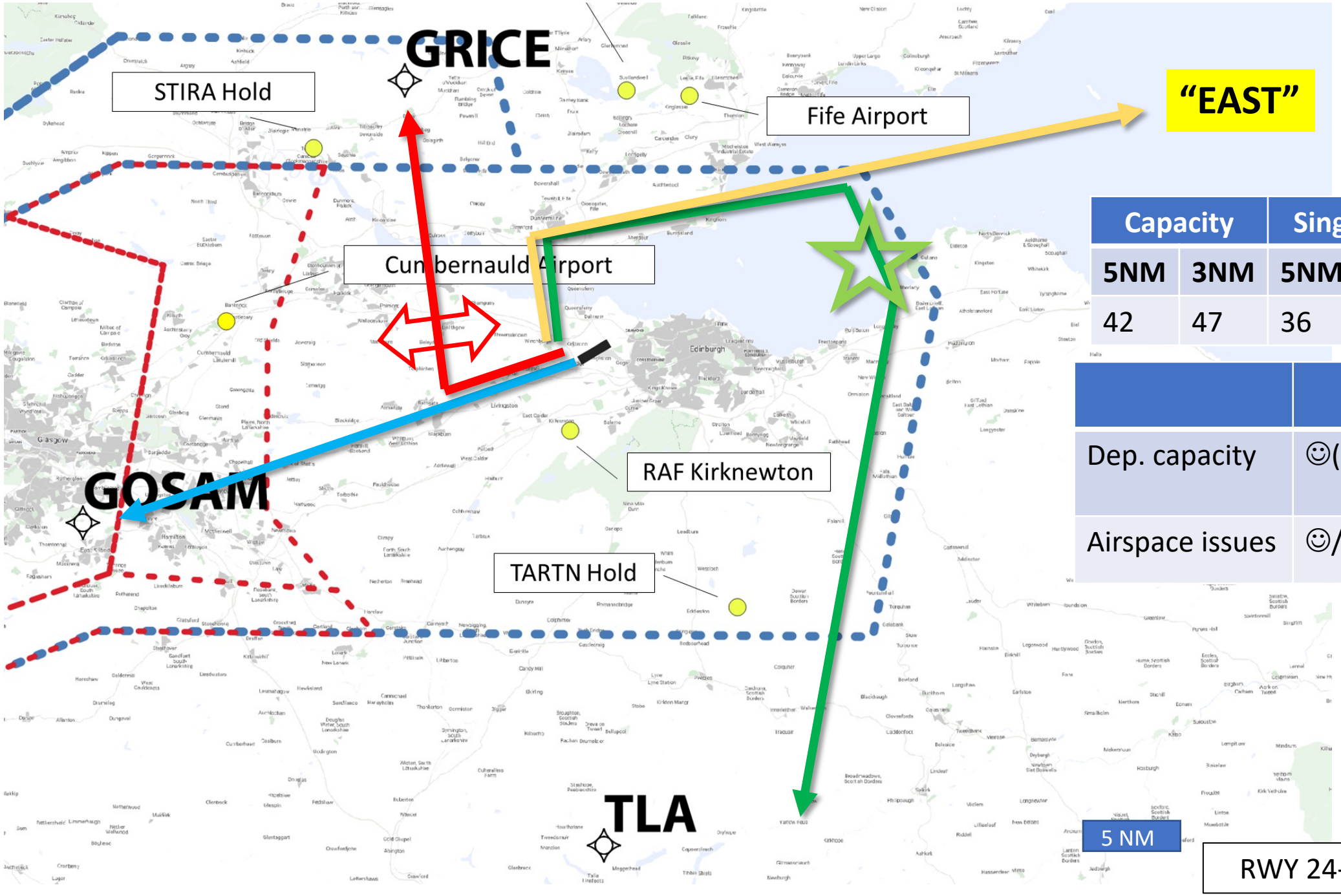


Capacity		Single SID	
5NM	3NM	5NM	3NM
41	46	36	40

Dep. capacity	☺(☺)
Airspace issues	☺

RWY 24-4xt-#6

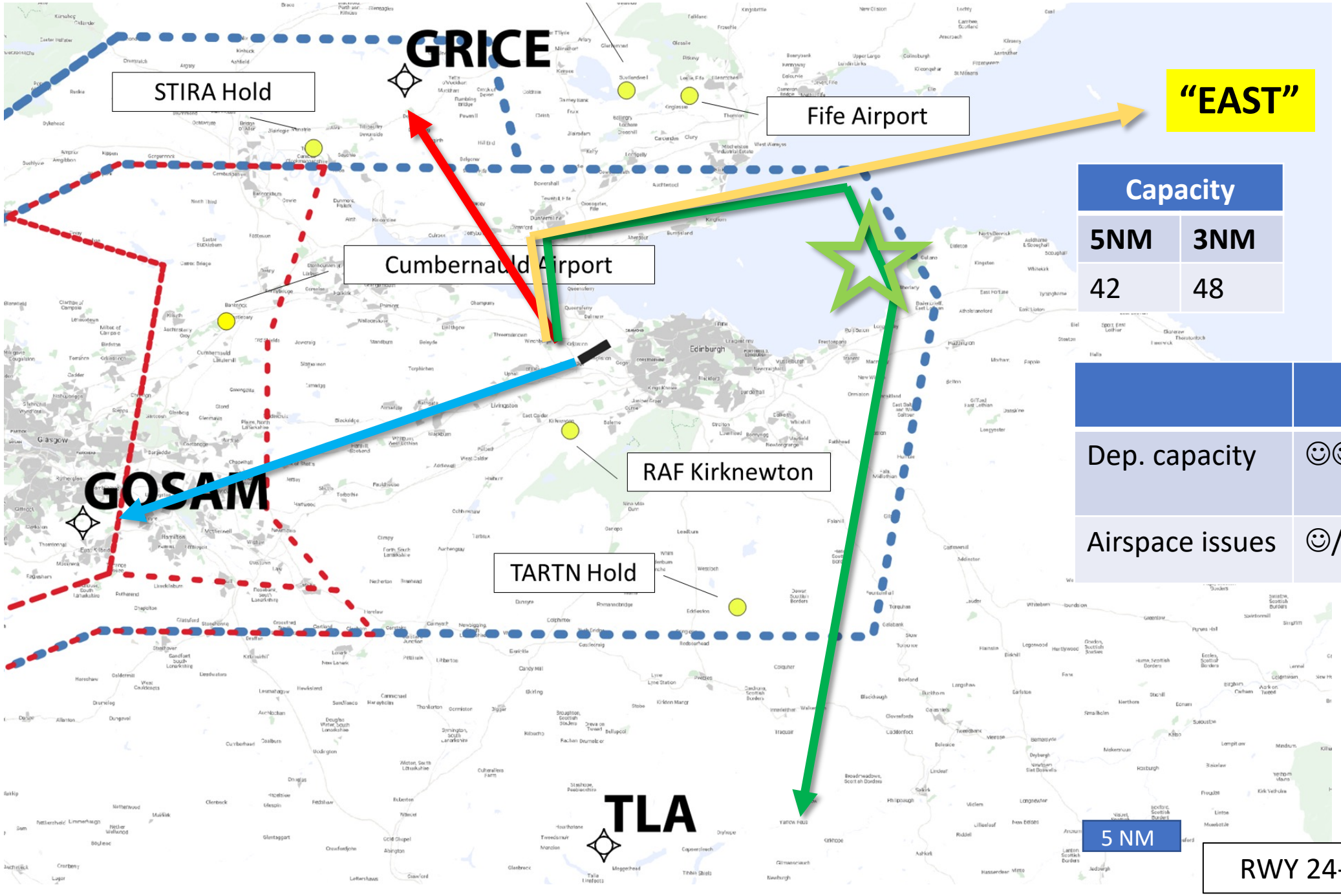

GRICE
STIRA Hold
Fife Airport
"EAST"
Capacity
5NM
3NM
36
40
Cumbernauld Airport
Edinburgh
RAF Kirknewton
GOSAM
TARTN Hold
TLA
Dep. capacity
☺
Airspace issues
☺/😐
5 NM
RWY 24-4xt-#7



Capacity		Single SID	
5NM	3NM	5NM	3NM
42	47	36	40

Dep. capacity	☺(☺)
Airspace issues	☺/😐

RWY 24-4xt-#8

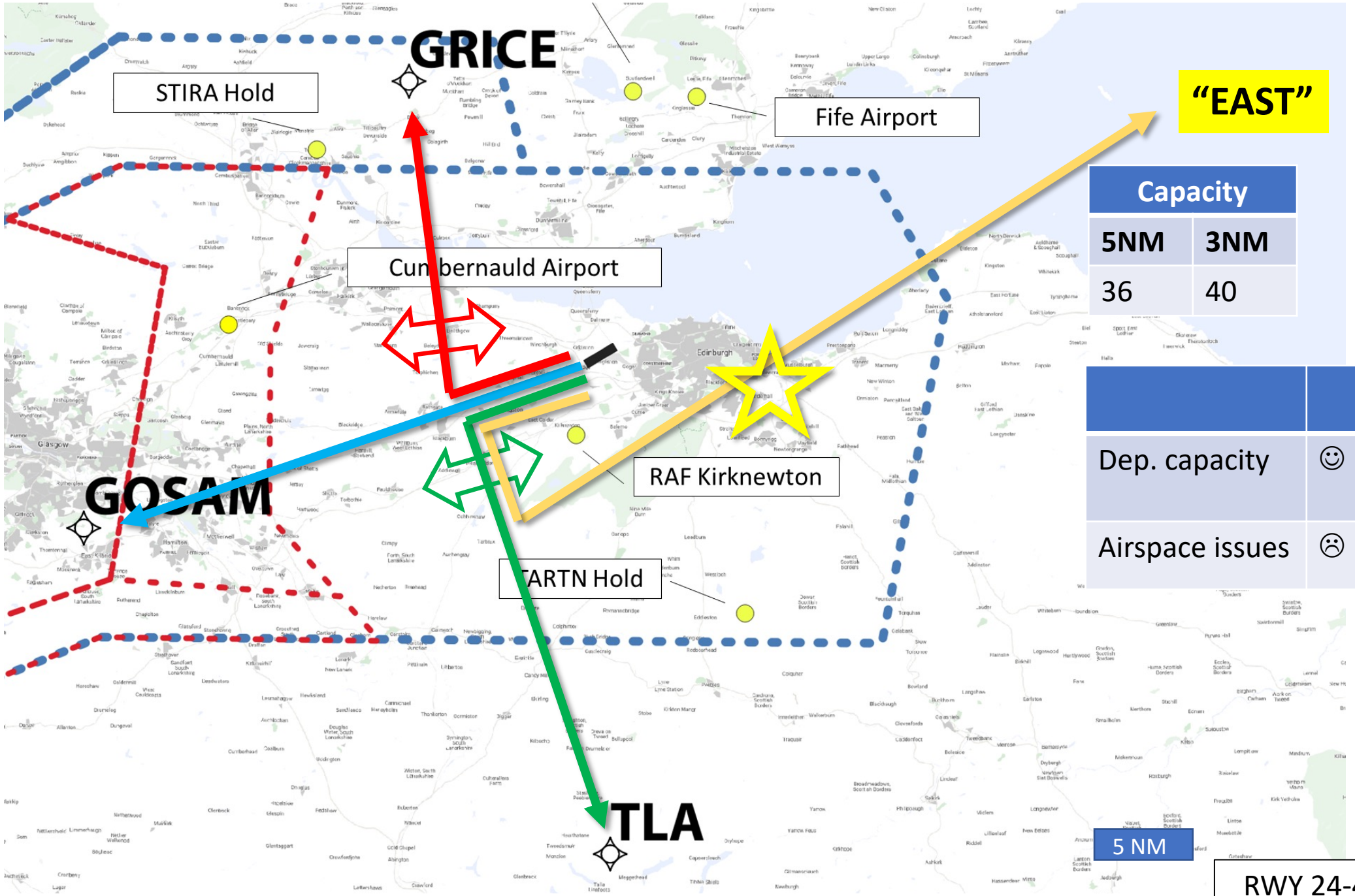


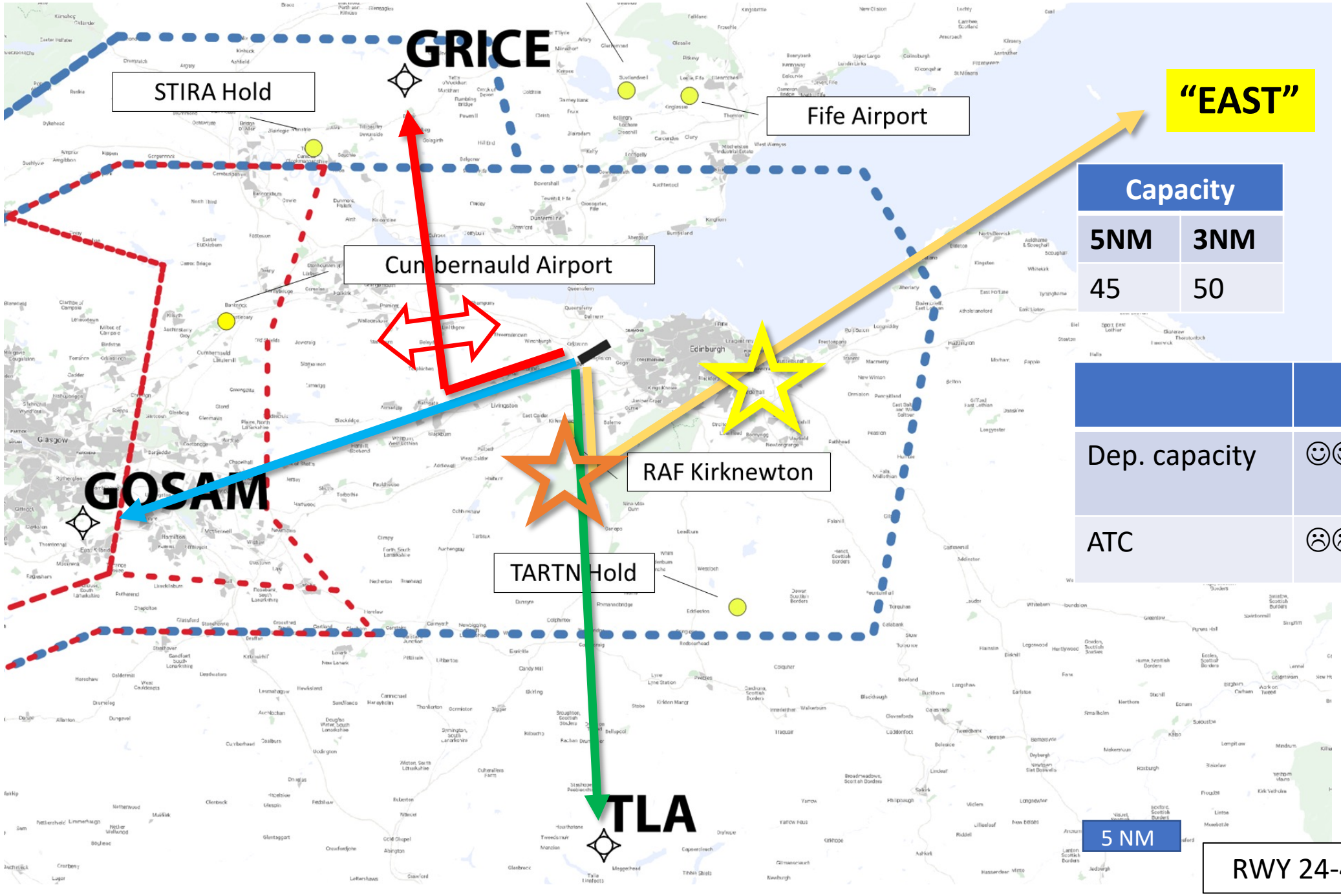
Capacity	
5NM	3NM
42	48

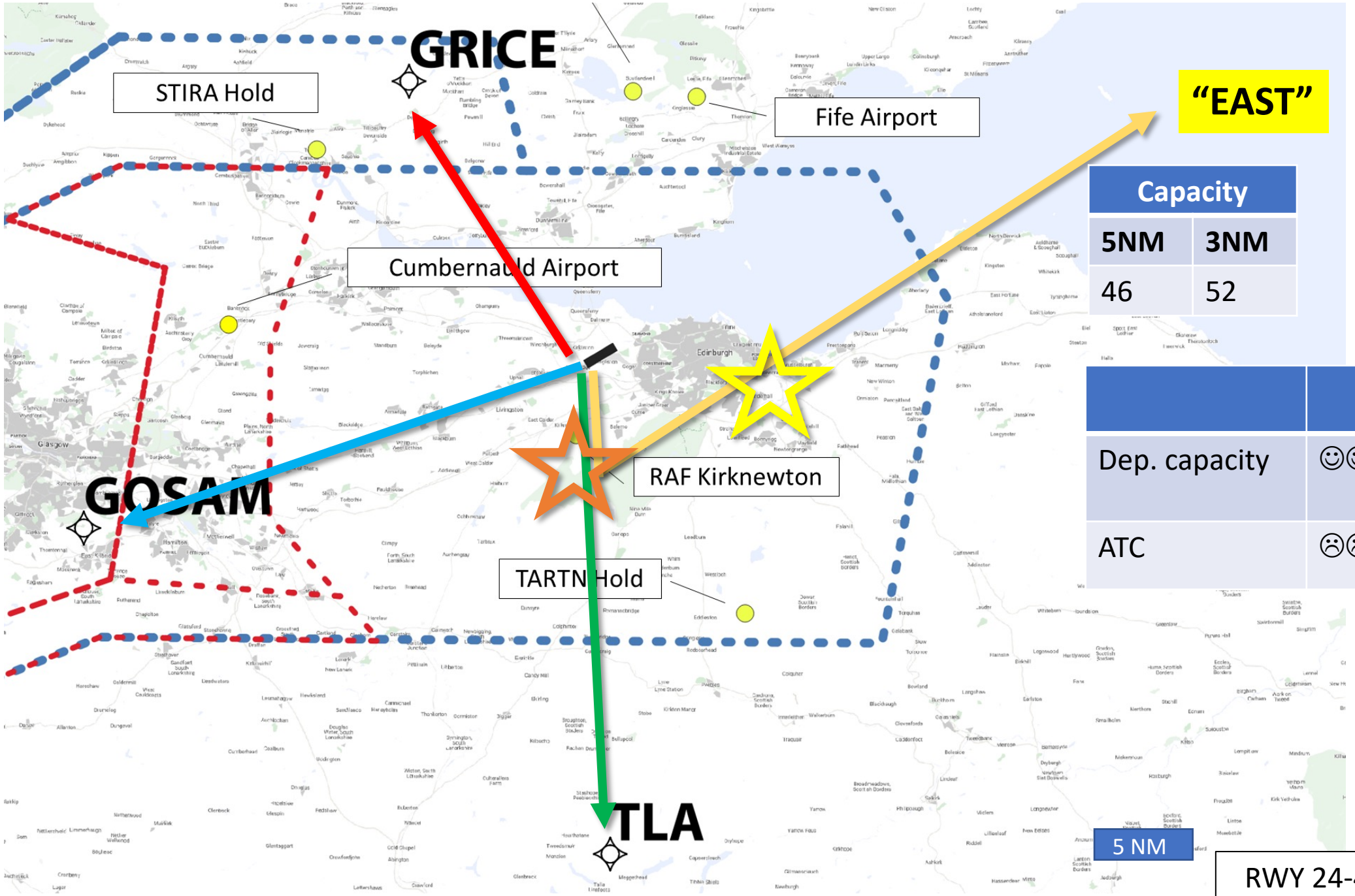
Dep. capacity	☺☺
Airspace issues	☺/😐

RWY 24-4xt-#9

RWY 24
4 exit points
“EAST” via south


GRICE
STIRA Hold
Fife Airport
"EAST"
Capacity
5NM
3NM
36
40
Cumbernauld Airport
Edinburgh
RAF Kirknewton
GOSAM
TARTN Hold
TLA
Dep. capacity
☺
Airspace issues
☹
5 NM
RWY 24-4xt-#10

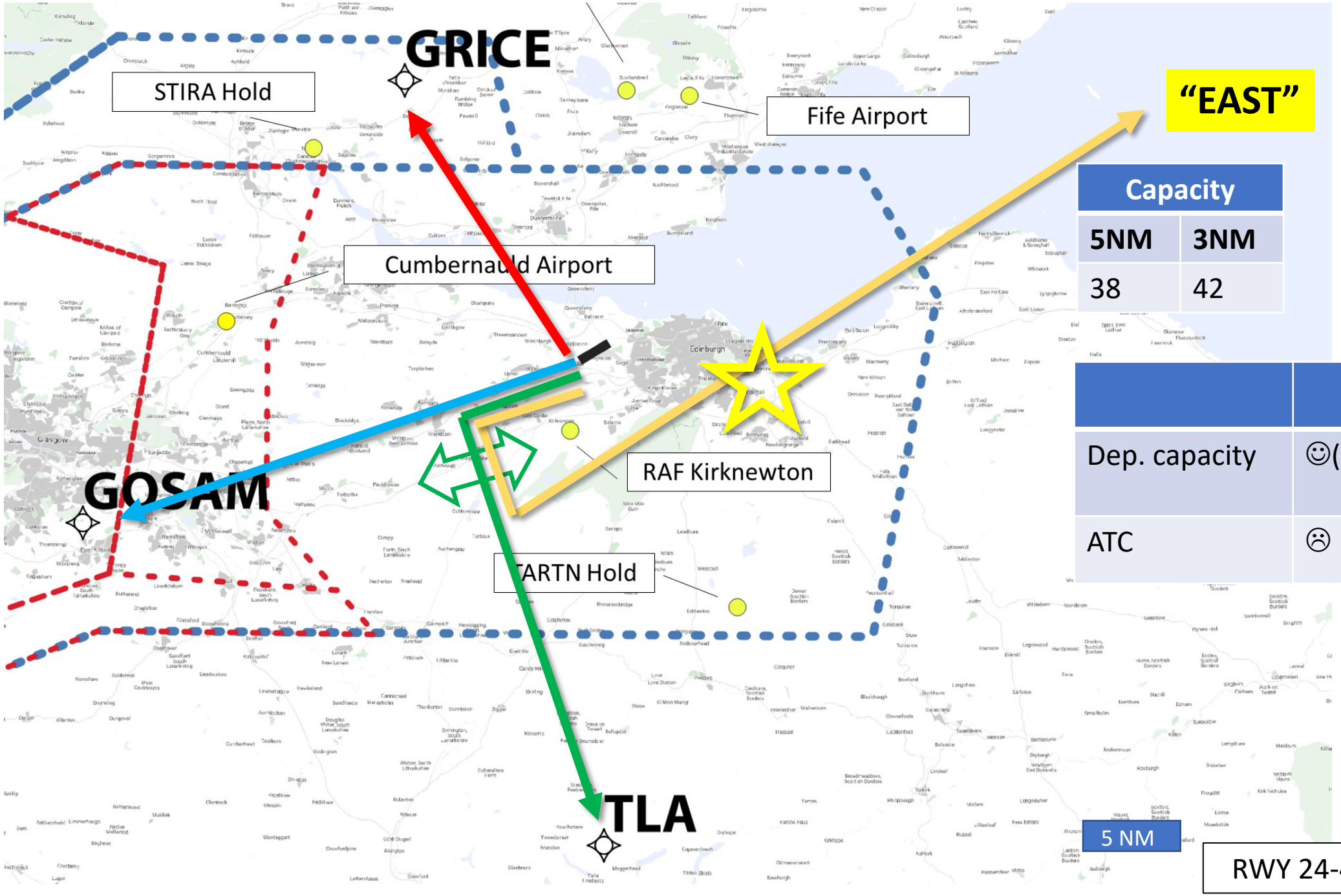

GRICE
STIRA Hold
Fife Airport
"EAST"
Capacity
5NM
3NM
45
50
Cumbernauld Airport
Edinburgh
Glasgow
GOSAM
RAF Kirknewton
TARTN Hold
TLA
5 NM
Dep. capacity
☺☺
ATC
☹☹
RWY 24-4xt-#11



Capacity	
5NM	3NM
46	52

Dep. capacity	☺☺☺
ATC	☹☹

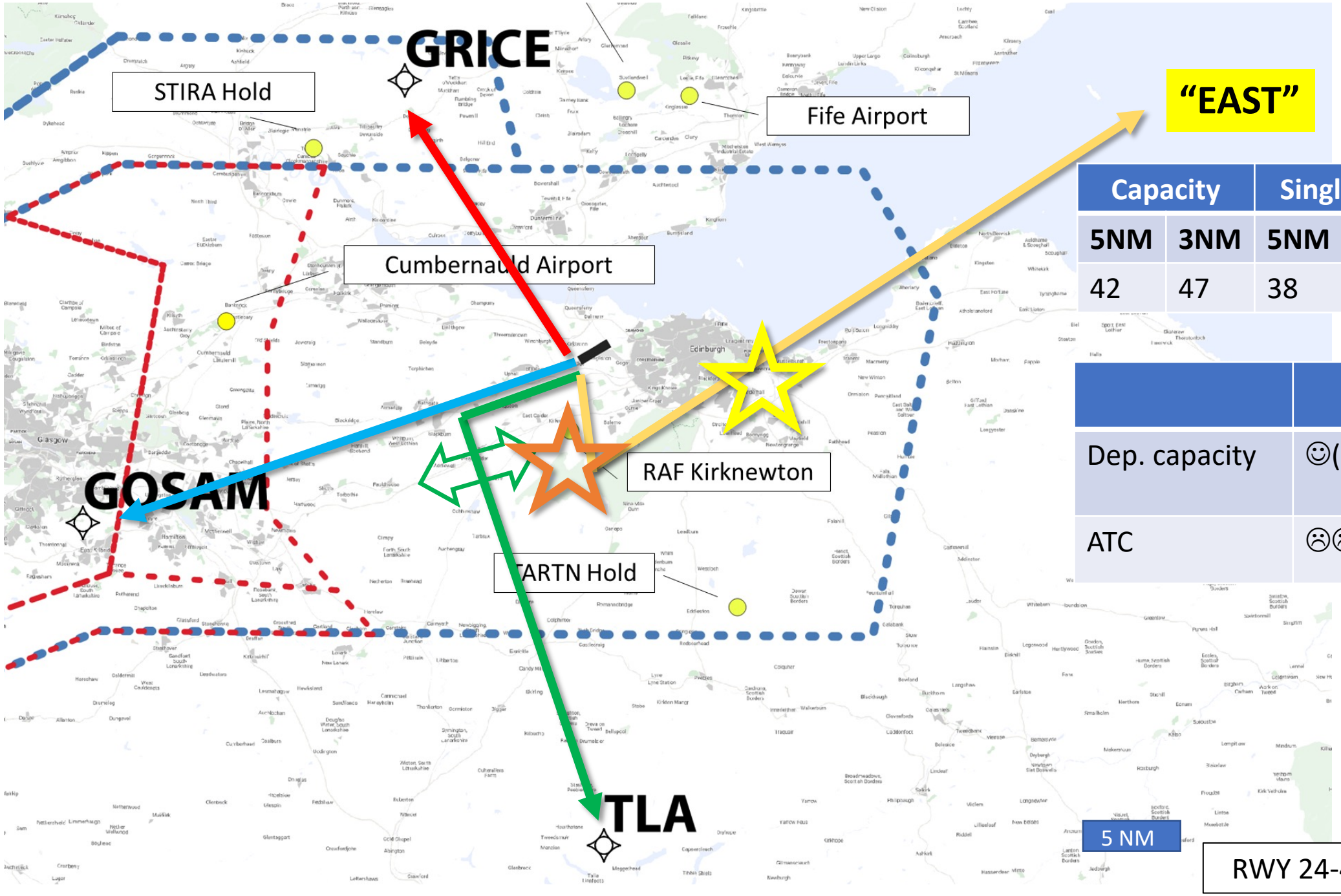
RWY 24-4xt-#12



Capacity	
5NM	3NM
38	42

Dep. capacity	☺(☺)
ATC	☹

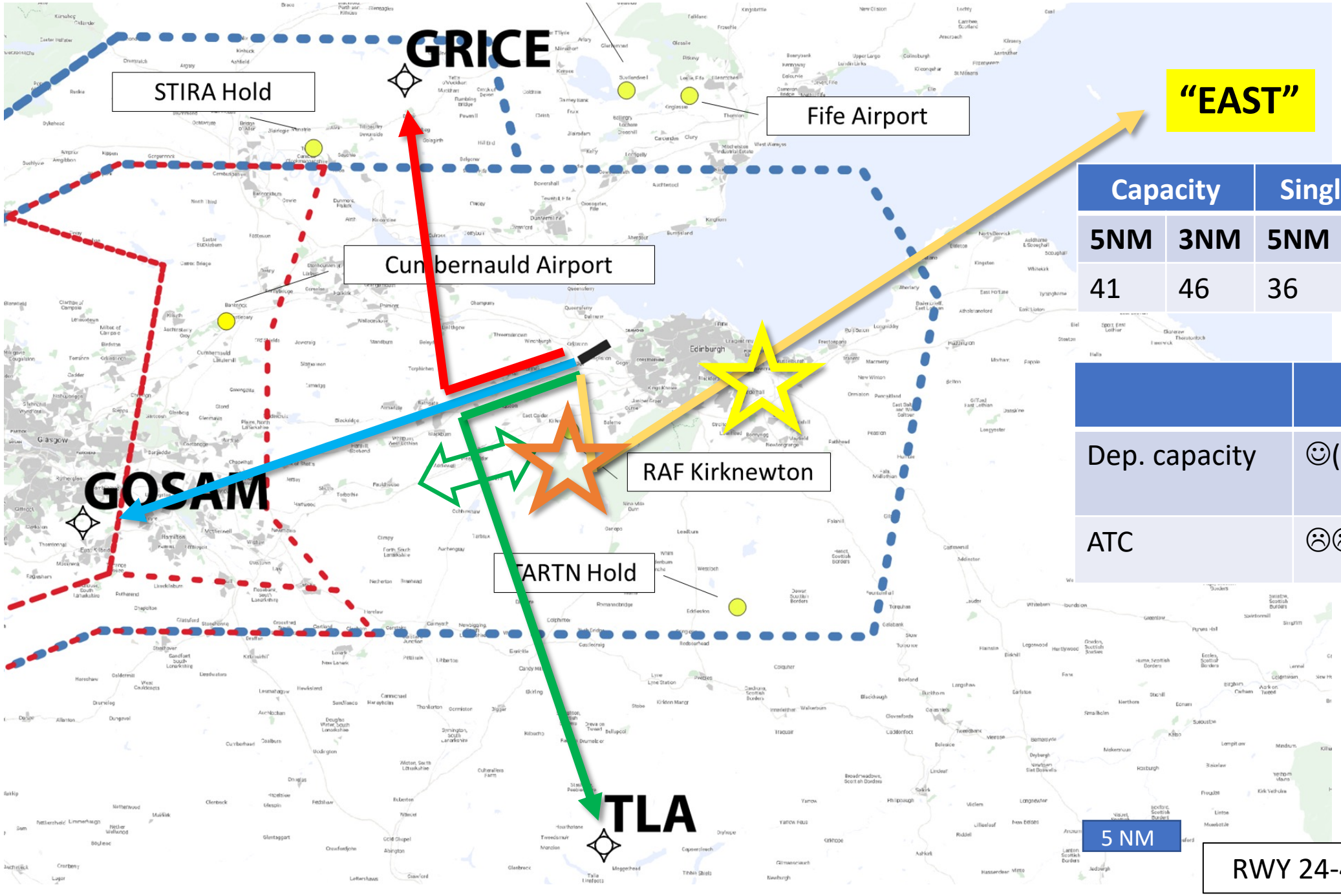
RWY 24-4xt-#13



Capacity		Single SID	
5NM	3NM	5NM	3NM
42	47	38	42

Dep. capacity	☺(☺)
ATC	☹☹

RWY 24-4xt-#14



Capacity		Single SID	
5NM	3NM	5NM	3NM
41	46	36	40

Dep. capacity	☺(☺)
ATC	☹☹

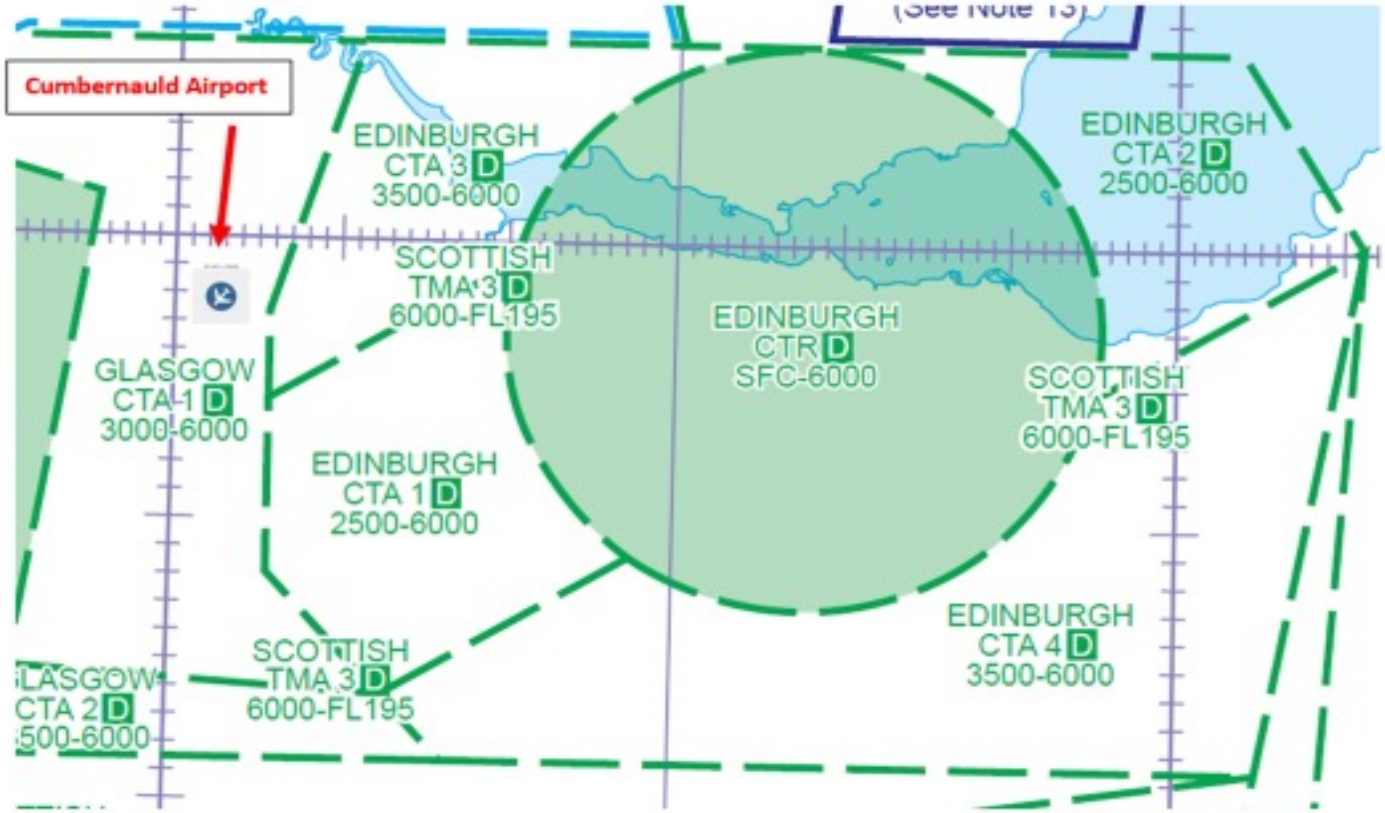
RWY 24-4xt-#15

FDP14: Requirements of airspace users should be taken into account when designing flight paths (Technical)

- Other airspace users are:
  - Military, transit aircraft, heli-routes and GA
  - (Para droppers, light aircraft, business jets, paragliders, microlights, gliders, non-radio aircraft hot air balloons
- Their requirements:
  - Classification of airspace
  - Reduction in airspace volume
  - Revision of LoA’s and standing agreements

Responses related to Edinburgh Airspace

DP 14



Summary – The responses on Edinburgh controlled airspace highlight the following:

- Existing controlled airspace currently structured around a closed Runway (RWY 12/30).
- Edinburgh airspace is excessive when compared with other UK airports.
- Areas to the North and South of Edinburgh reportedly underused.

The responses on Edinburgh controlled airspace have requested that the Edinburgh CTA base levels to be raised, particularly Edinburgh CTAs 2, 3 & 4. The focus being on removing airspace associated with Runway 12/30.

MODERNISING
OUR SKIES

Edinburgh Airport
Where Scotland meets the world

Break

Arrivals & approaches

MODERNISING
OUR SKIES

Edinburgh Airport
Where Scotland meets the world

Arrivals and Approaches

4 Options

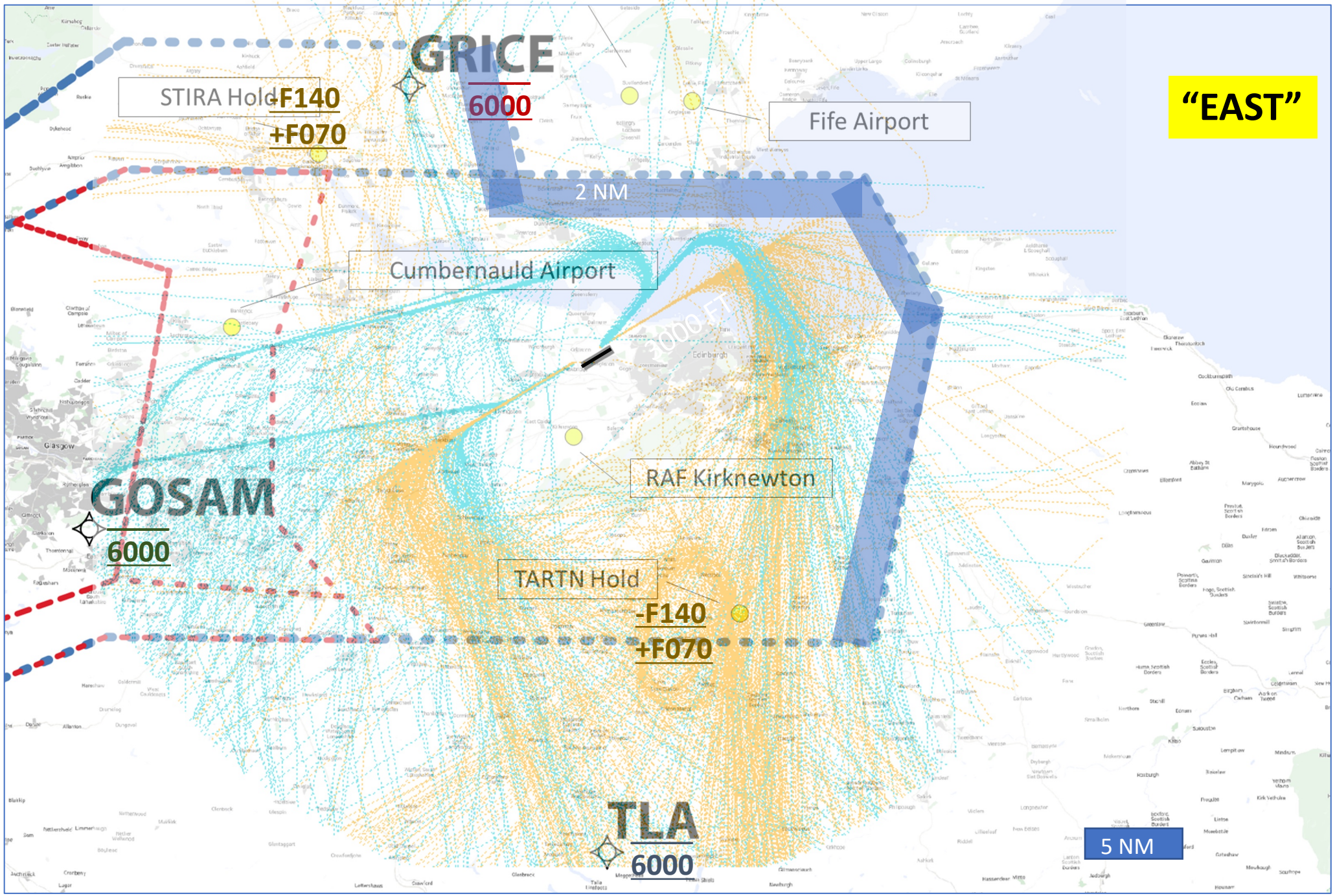
Holds if necessary to Radar vectoring

Some vectoring and some systemisation

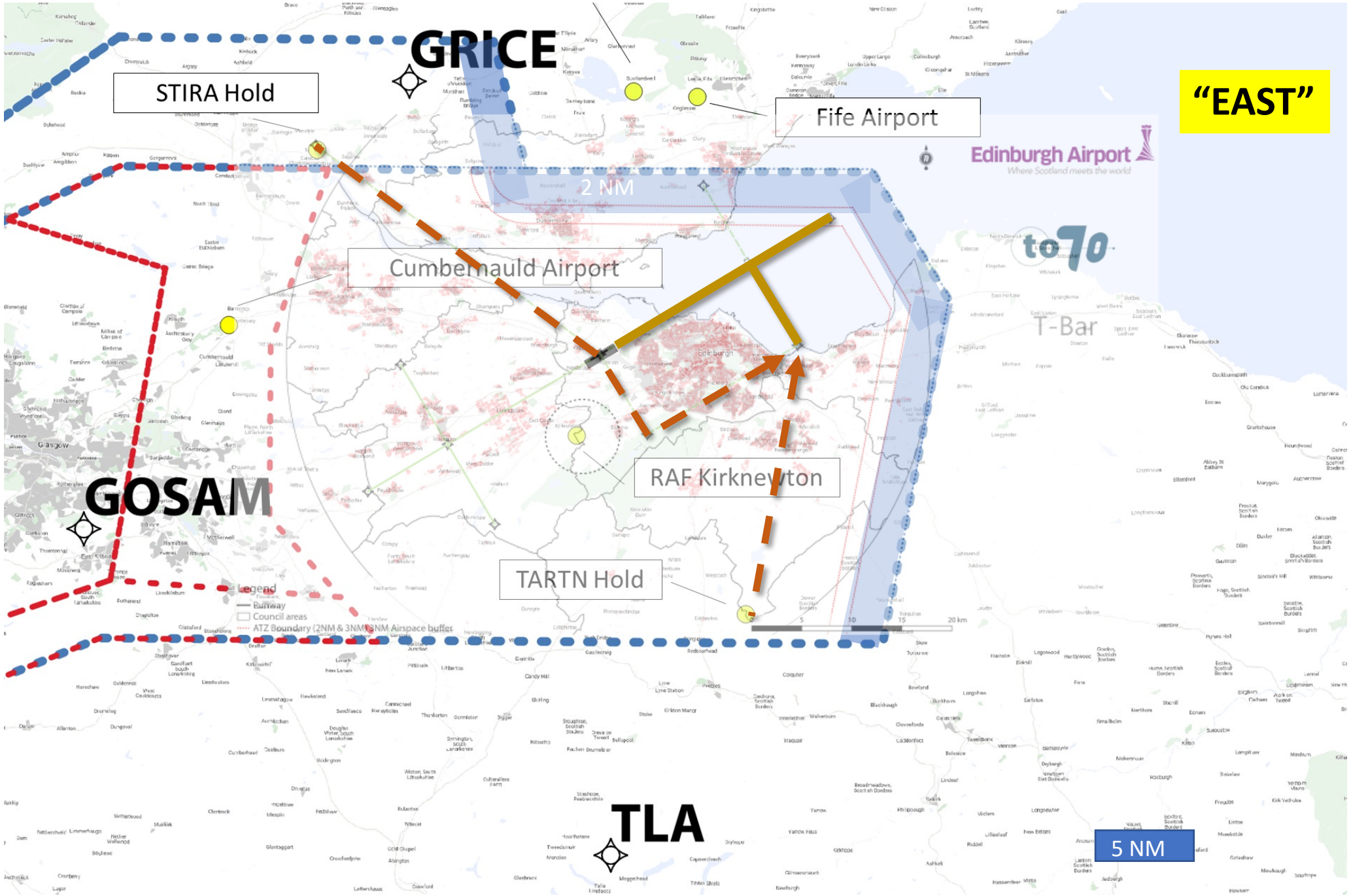
Full systemisation

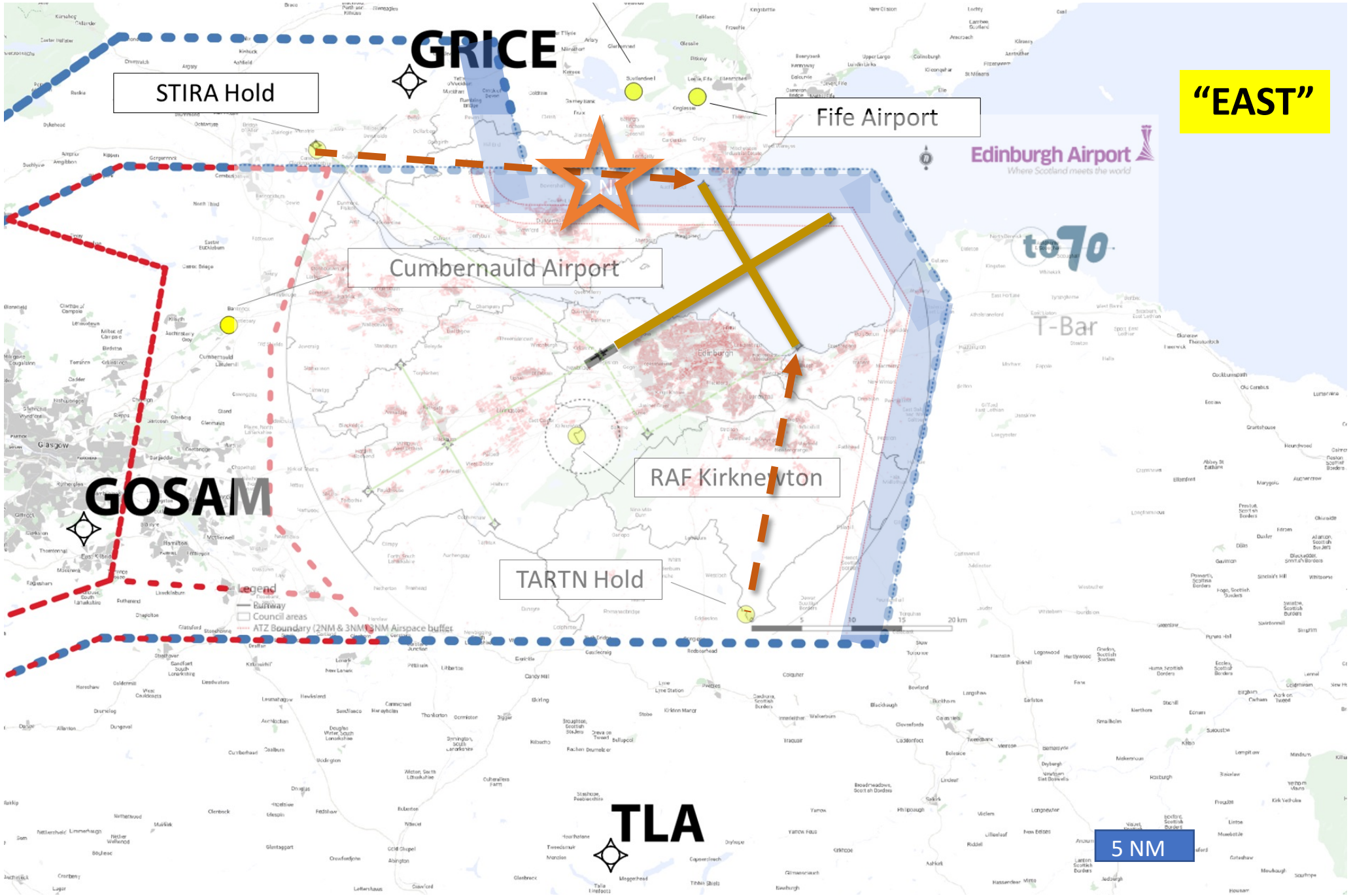
Point merge – Long list –Large volume of Controlled Airspace – Reduction of Flexibility

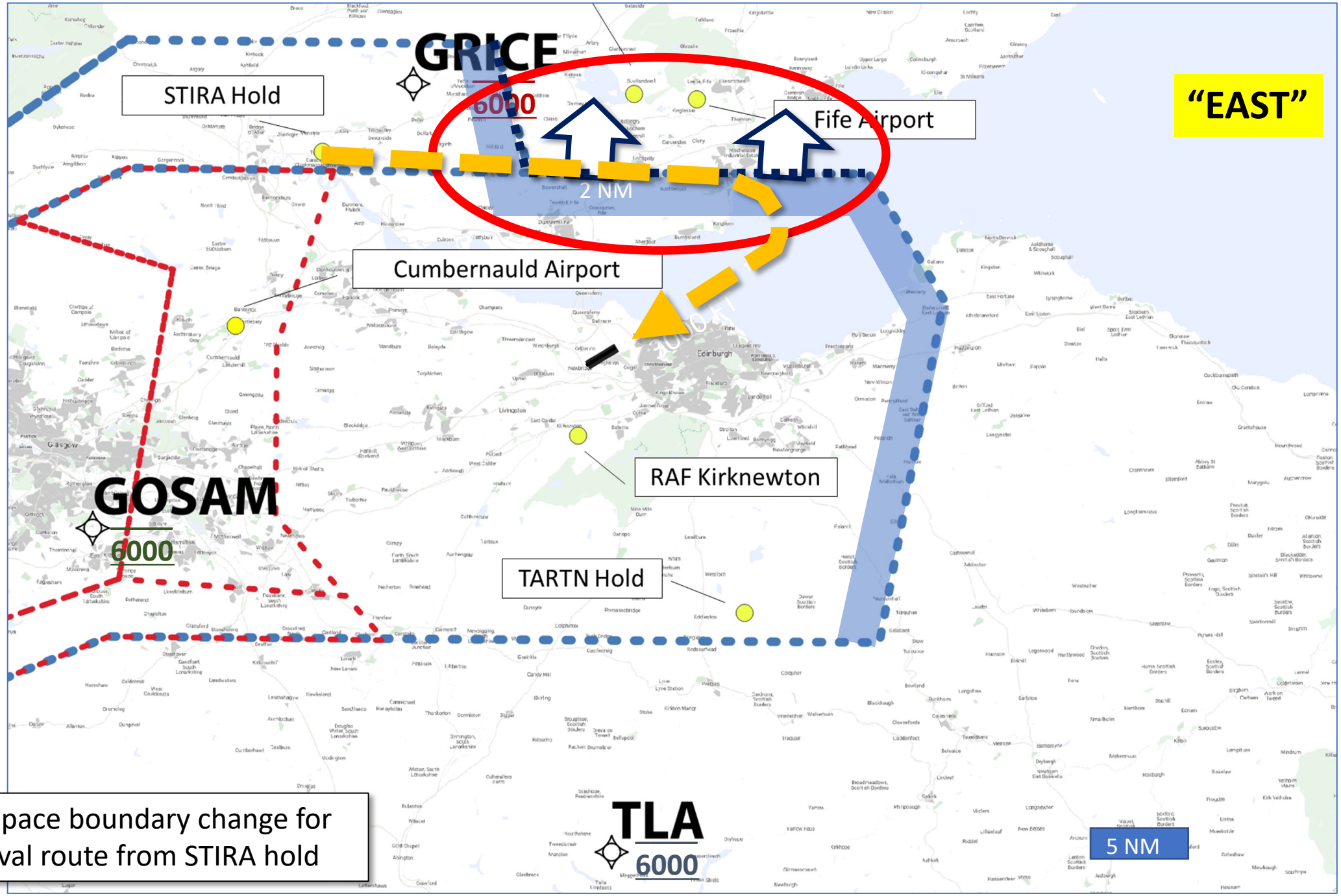
Current patterns
(orange = arrivals)


GRICE
6000
STIRA Hold
-F140
+F070
Fife Airport
"EAST"
2 NM
Cumbernauld Airport
6000 FT
Edinburgh
Glasgow
GOSAM
6000
RAF Kirknewton
TARTN Hold
-F140
+F070
TLA
6000
5 NM

RWY 24
2 approach routes

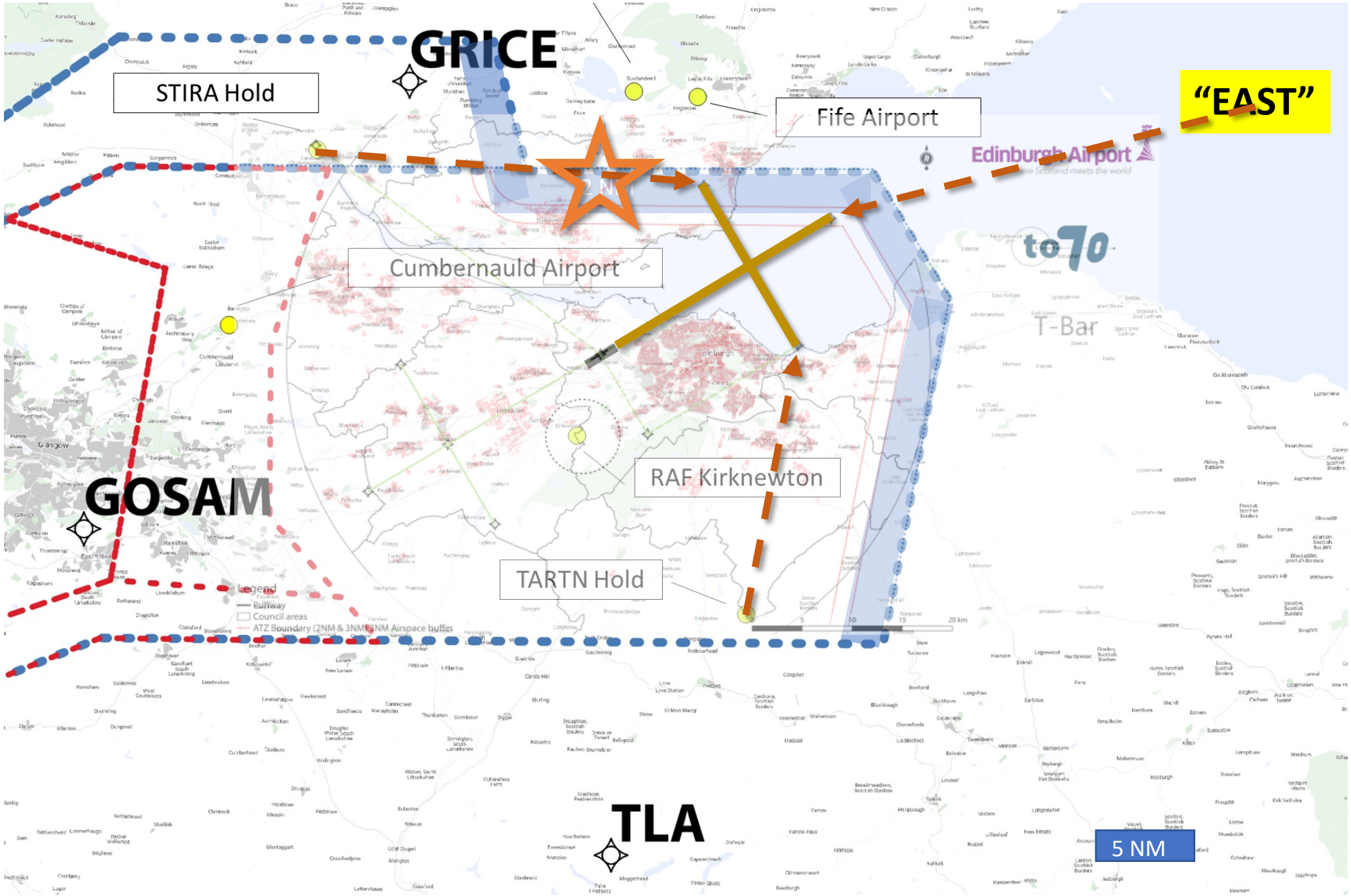

GRICE
STIRA Hold
Fife Airport
"EAST"
Edinburgh Airport
Where Scotland meets the world
2 NM
Cumbernauld Airport
T-Bar
RAF Kirknewton
GOSAM
TARTN Hold
Legend
Runway
Council areas
ATZ Boundary (2NM & 3NM) 5NM Airspace buffer
TLA
5 NM

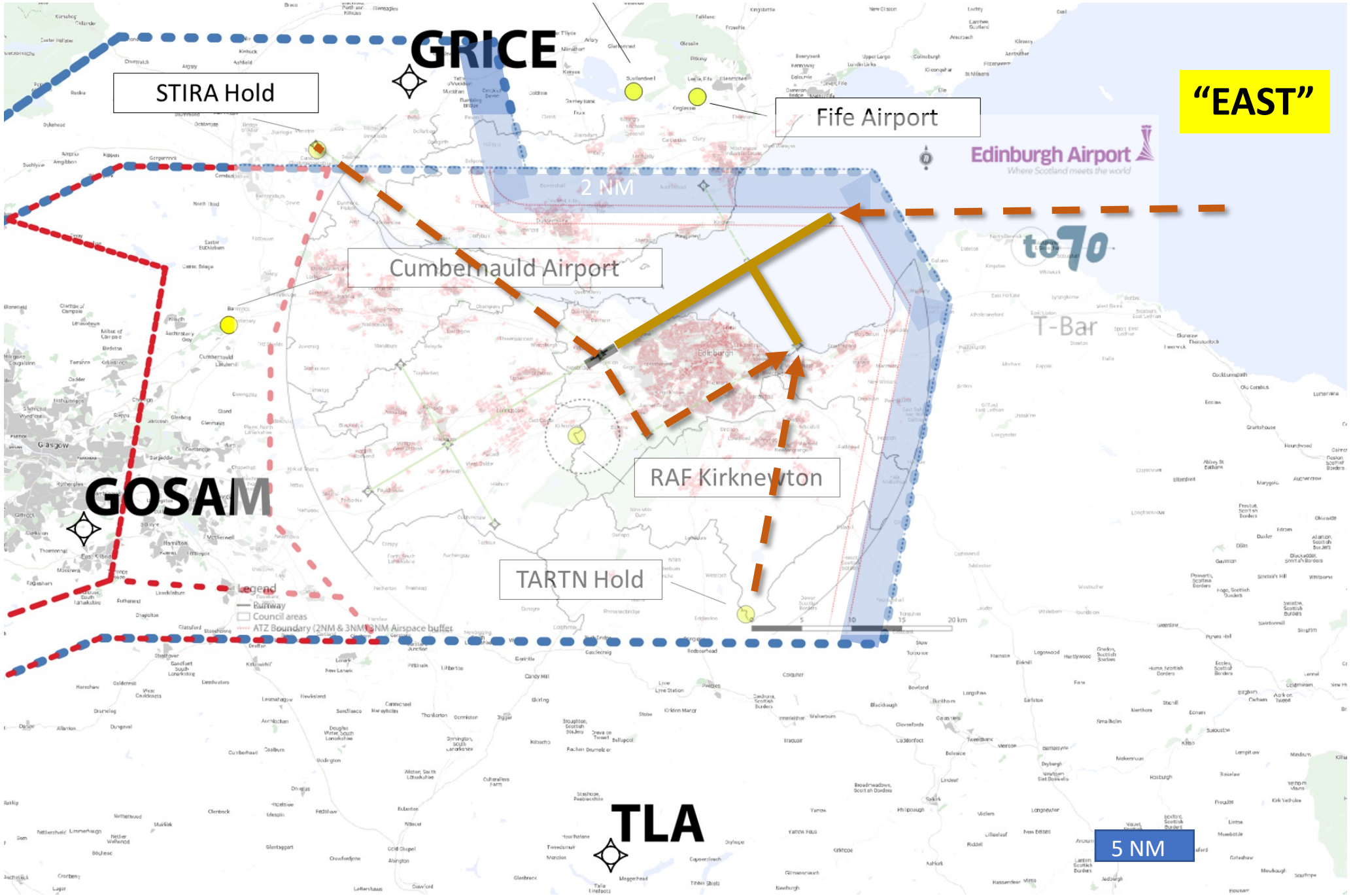

GRICE
STIRA Hold
Fife Airport
"EAST"
Edinburgh Airport
Where Scotland meets the world
2 N
Cumbernauld Airport
T-Bar
RAF Kirknewton
GOSAM
TARTN Hold
Legend
Runway
Council areas
ATZ Boundary (2NM & 3NM) 5NM Airspace buffer
TLA
5 NM



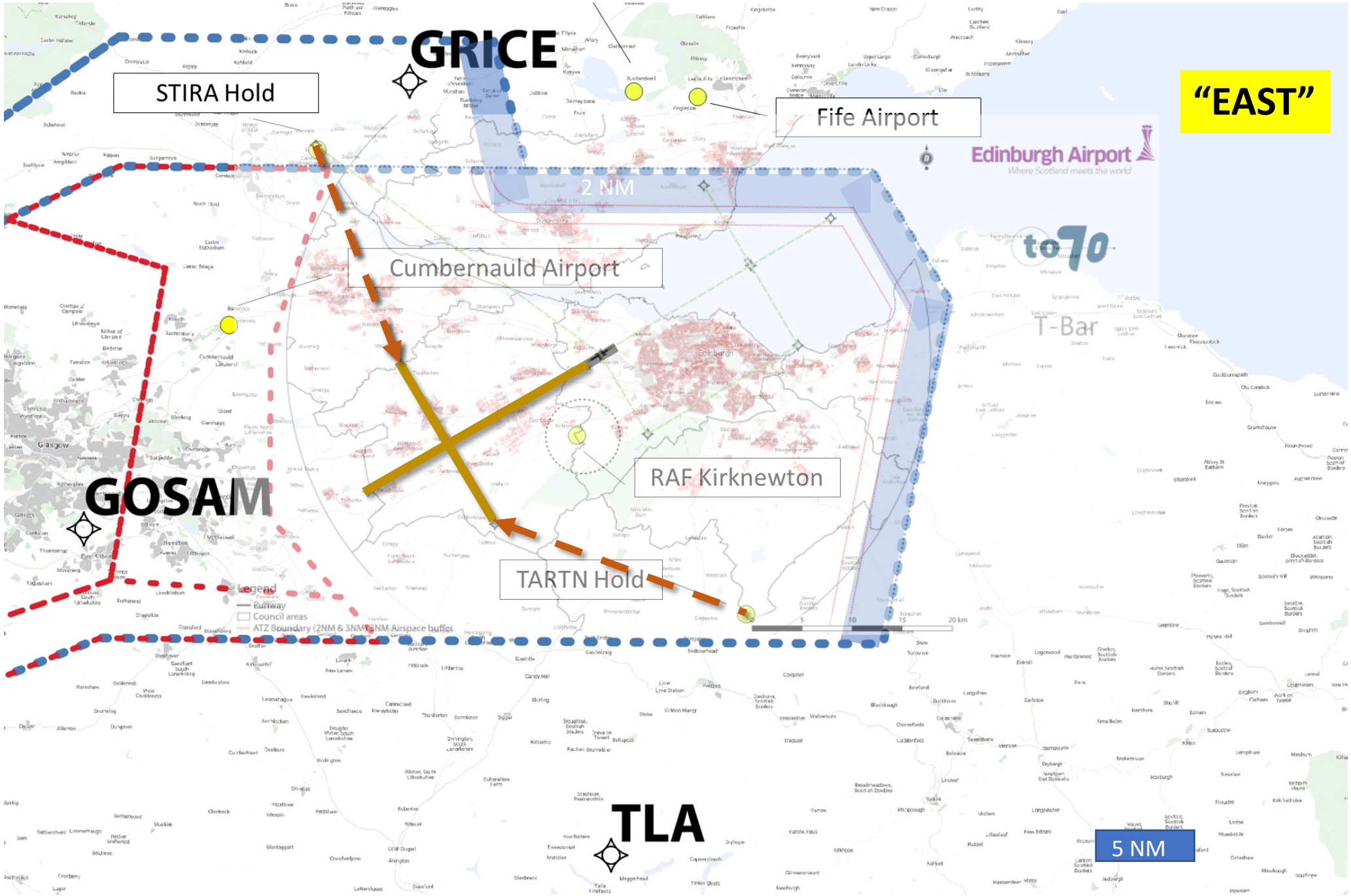
Airspace boundary change for arrival route from STIRA hold

RWY 24
3 approach routes

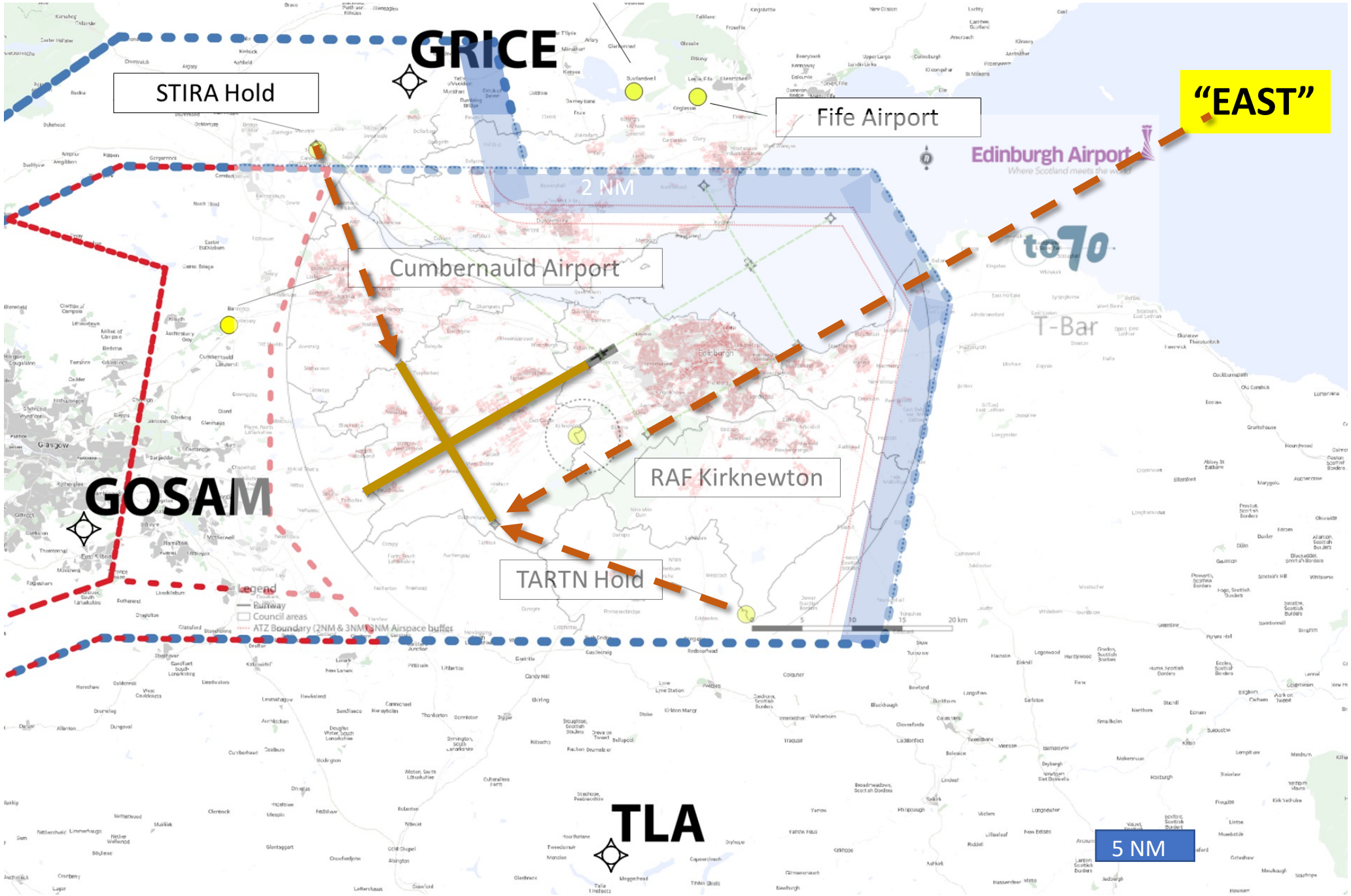

GRICE
STIRA Hold
Fife Airport
"EAST"
Edinburgh Airport
Cumbernauld Airport
RAF Kirknewton
GOSAM
TARTN Hold
TLA
Legend
Runway
Council areas
ATZ Boundary (2NM & 3NM) 5NM Airspace buffer
5 NM

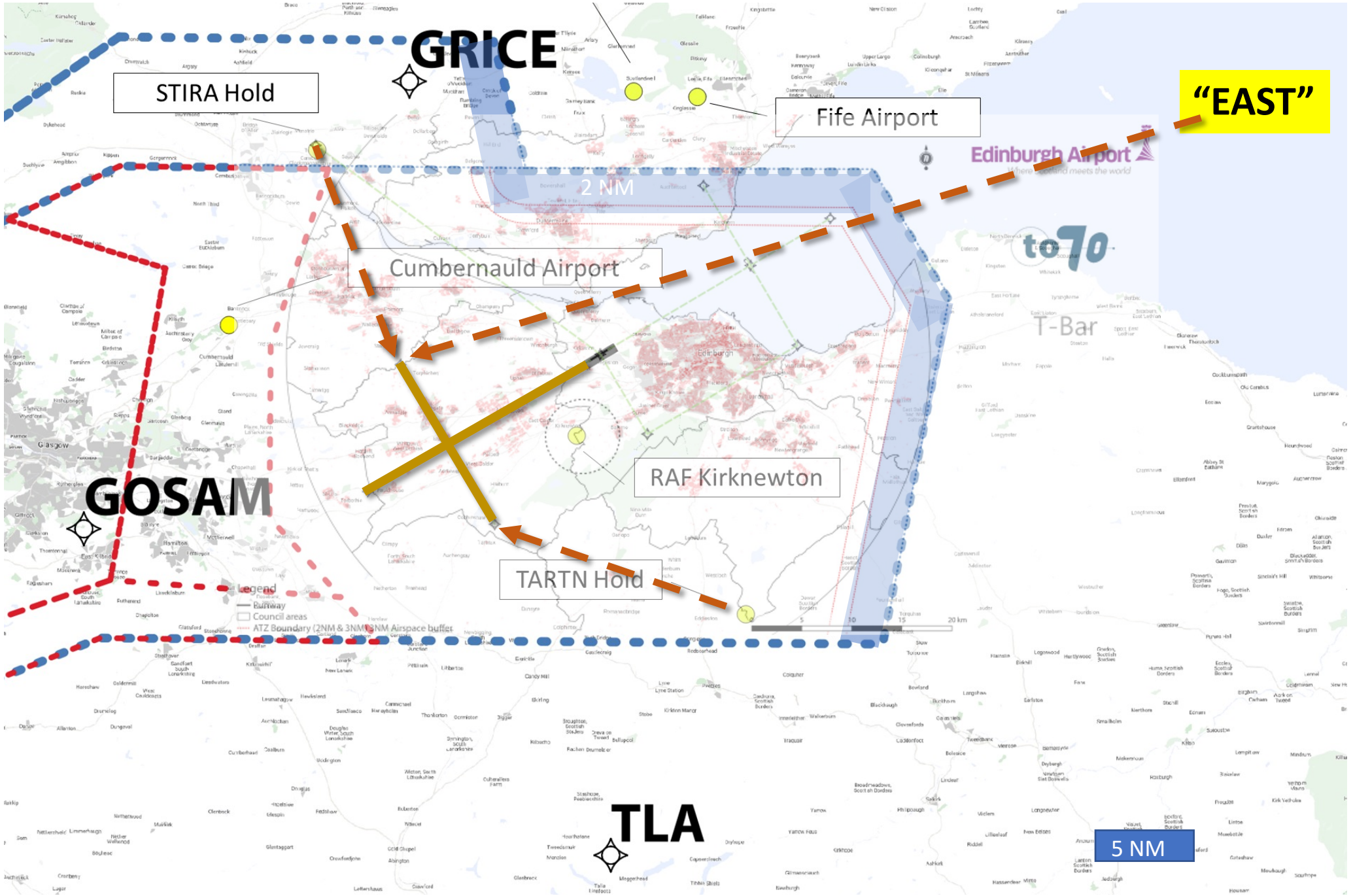

GRICE
STIRA Hold
Fife Airport
"EAST"
Edinburgh Airport
Where Scotland meets the world
2 NM
Cumbernauld Airport
RAF Kirknewton
GOSAM
TARTN Hold
TLA
Legend
Runway
Council areas
ATZ Boundary (2NM & 3NM) 5NM Airspace buffer
5 NM

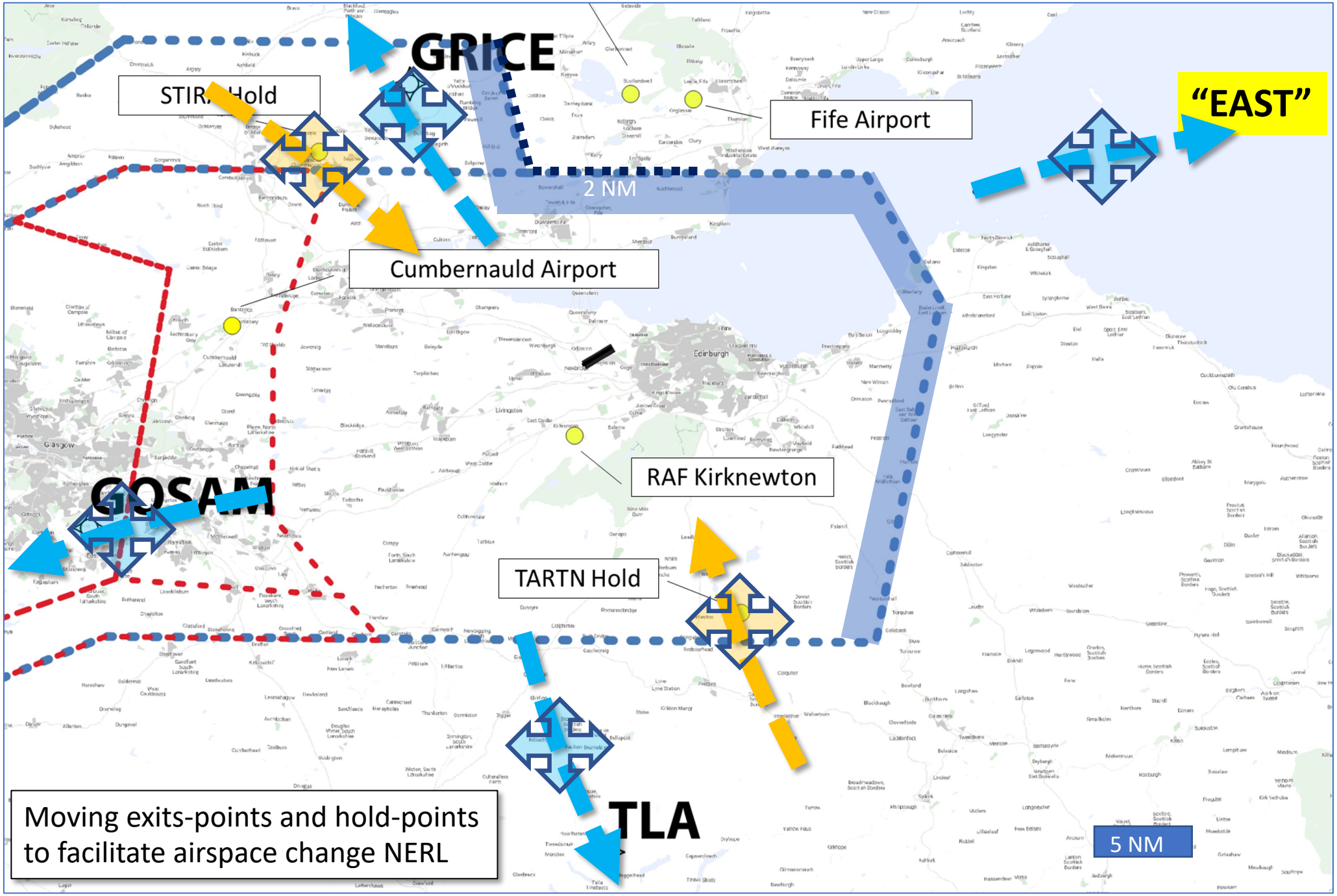
RWY 06
2 approach routes

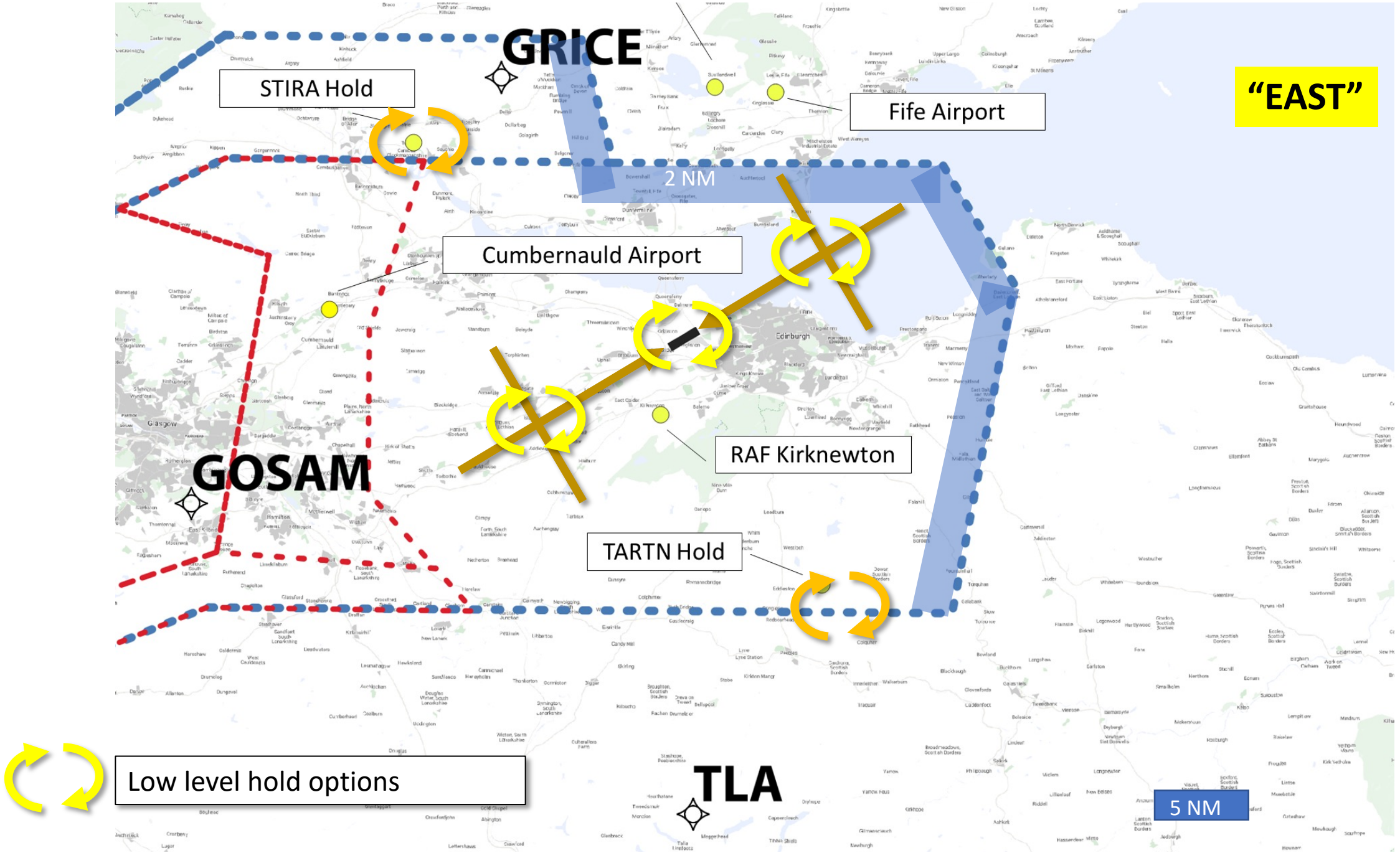

GRICE
STIRA Hold
Fife Airport
"EAST"
Edinburgh Airport
Where Scotland meets the world
2 NM
Cumbernauld Airport
T-Bar
RAF Kirknewton
GOSAM
TARTN Hold
Legend
Runway
Council areas
ATZ Boundary (2NM & 3NM) 5NM Airspace buffer
TLA
5 NM

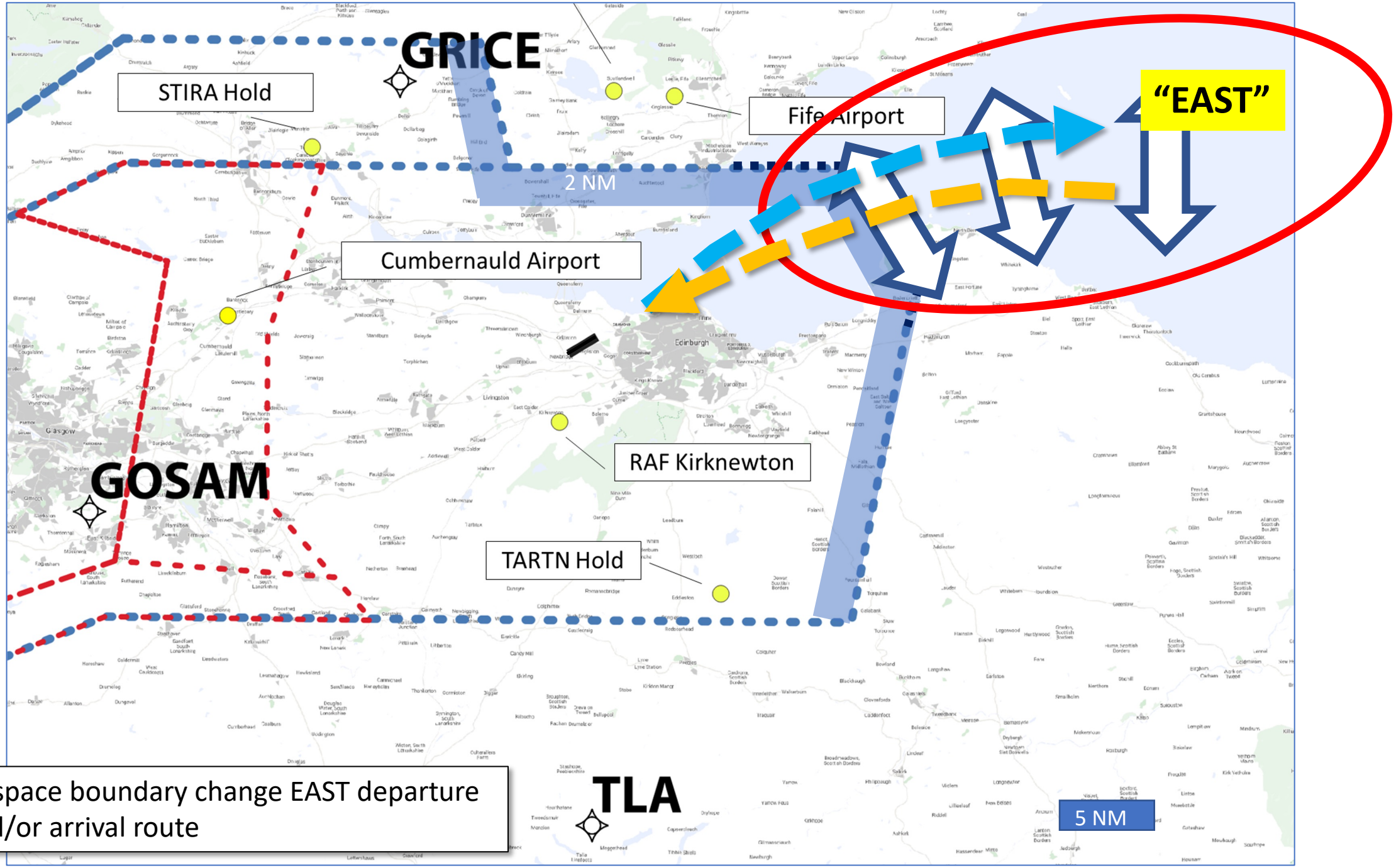
RWY 06
3 approach routes


GRICE
STIRA Hold
Fife Airport
"EAST"
Edinburgh Airport
Where Scotland meets the world
2 NM
Cumbernauld Airport
T-Bar
RAF Kirknewton
GOSAM
TARTN Hold
Legend
Runway
Council areas
ATZ Boundary (2NM & 3NM) 5NM Airspace buffer
TLA
5 NM


GRICE
STIRA Hold
Fife Airport
"EAST"
Edinburgh Airport
2 NM
Cumbernauld Airport
RAF Kirknewton
GOSAM
TARTN Hold
TLA
5 NM
Legend
Runway
Council areas
ATZ Boundary (2NM & 3NM) 5NM Airspace buffer


GRICE
STIR Hold
Fife Airport
"EAST"
2 NM
Cumbernauld Airport
Edinburgh
Glasgow
Livingston
RAF Kirknewton
COSAM
TARTN Hold
TLA
5 NM
Moving exits-points and hold-points
to facilitate airspace change NERL


GRICE
STIRA Hold
Fife Airport
"EAST"
2 NM
Cumbernauld Airport
Edinburgh
RAF Kirknewton
GOSAM
TARTN Hold
TLA
Low level hold options
5 NM



Airspace boundary change EAST departure and/or arrival route

Further Design Principles

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FDP7: Flight paths should be designed to minimise the total adverse effect on health and quality of life created by aircraft noise and emissions (Health and wellbeing)

- NOISE – qualitative statement for stage 2
  - CCO and CDO
- AIR QUALITY
  - Current baseline is metric for all measurements assessed at programme level
- TRANQUILITY (Quality of life)
  - Not a number yet. Possible impact. Qualitative

FDP8: For flightpaths at or above 4,000ft to below 7,000ft, the environmental priority should continue to be minimising the impact of aviation noise in a manner consistent with the government's overall policy on aviation noise, unless this would disproportionately increase CO_2 emissions (Health and wellbeing)

- NOISE – qualitative description of population within these height bands
  - Description of noise up to 4000ft and between 4000ft and 7000ft.Noise is prioritised up to 7000ft
- AIR QUALITY 1000ft assessed at programme level
- CARBON
  - Length of flight path (more of less track miles) than other options

FDP9: Flight paths should be designed to minimise population overflown below 4,000ft and, between 4,000ft and 7,000ft, taking into account any potential adverse impact, due to those overflown having protected characteristics, as defined by the Equalities Act 2010 (Health and wellbeing)

- NOISE – qualitative
- Minimising population overflown contributes to this DP
- People with the characteristics are assumed to be widely distributed except obvious clusters (retirement villages – war blind place Kirknewton)

- Protected characteristics
- Age, Disability, Gender Reassignment, Marriage or civil partnership, pregnancy and maternity, race, religion or belief, sex and sexual orientation.

FDP10: Flight paths should be designed to minimise overflying sensitive locations and noise-sensitive receptors (for example, the zoo, retirement complexes, green spaces, historic heritage sites, and others)(Health and wellbeing)

- NOISE – qualitative
  - Receptors maps identifying non-residential receptors produced
- TRANQUILITY
  - Comparison of designated sites affected compared across options
  - Schools, hospitals, care homes
  - Local knowledge
    - Rosyth school
    - Country parks

FDP11: Flight paths should be designed to include track concentration and/or track dispersal options to provide noise respite. (Health and wellbeing)

- NOISE – qualitative
  - Does the option offer the potential for scheduled respite? Respite is planned
  - Respite designed – M8 Corridoor – Firth of Forth (Livingston – Fife Coast)
  - Timed SID – not favoured. All options for SIDs listed
  - Turns and distribution of paths depending on performance.
  - Consider implementing no vectoring from the flight paths until 7000ft – thereby limiting the number outliers and dispersal of the tracks? (SIDs)
  - Approach vectoring leads to dispersal

FDP12: Flight paths should be designed with routes that minimise track miles and fuel burn (Operational)

- CARBON
  - Comparison of track miles as an indicator of fuel burn
  - CCO and CDO

FDP13: Flight paths should be designed to ensure efficient and effective route management (Operational)

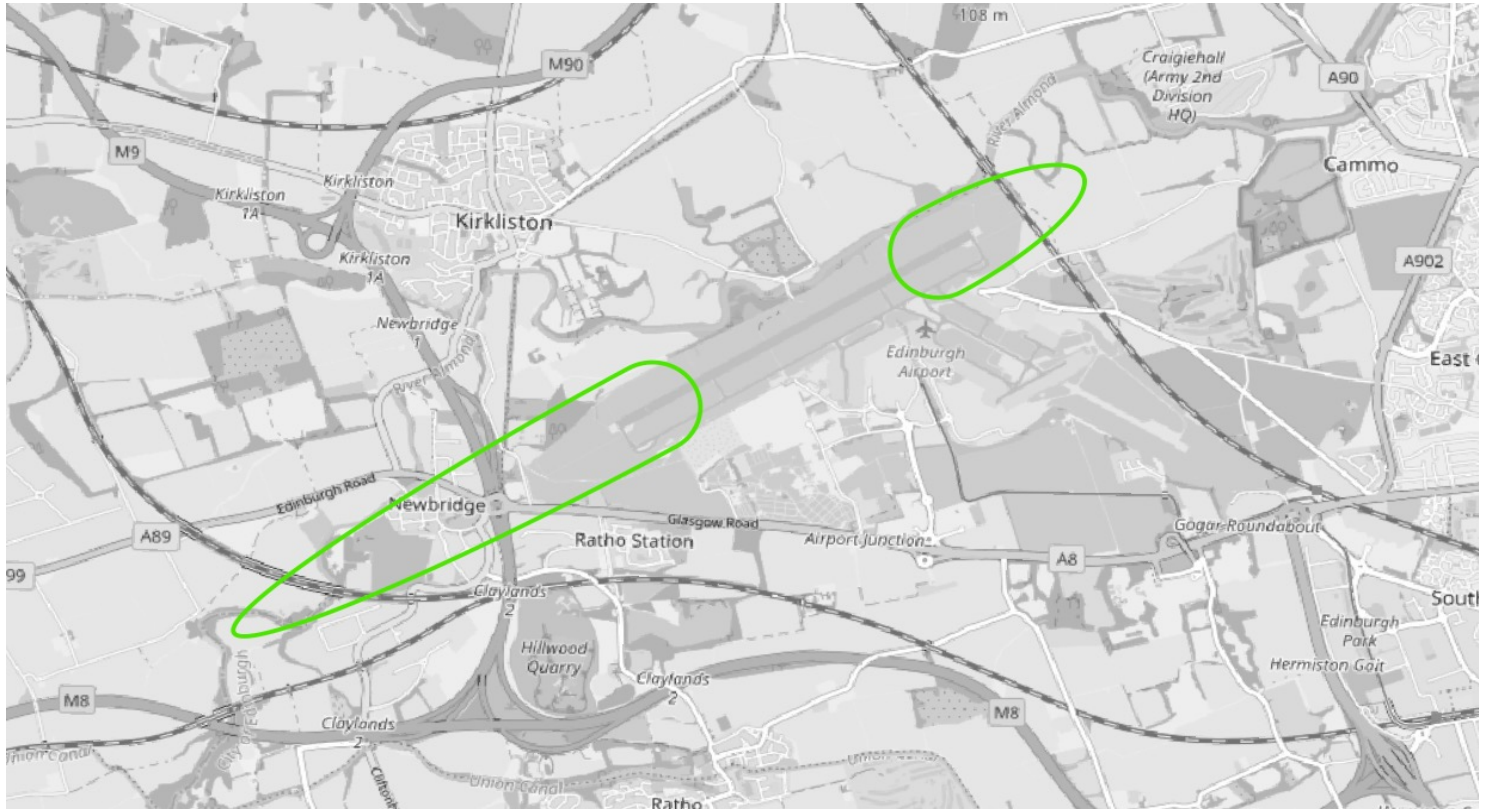
- Looking at end to end distance.
- Continuous Climb operations (CCO) and Continuous descent operations (CDO)
- Carbon reduction and fuel reduction are good metrics to use here.

FDP15: Flight paths should be designed to minimise adverse local air quality impacts (Environment)

- AIR QUALITY
  - Programme wide
  - Oxides of nitrogen (NOx) emissions from runways have been shown to disperse rapidly beyond the immediate runway area
  - Due to the effects of mixing and dispersion, emissions from aircraft above 1,000 ft are unlikely to have a significant impact on local air quality

ACP - the approach to Air Quality assessment

- Hypothetical WebTAG Concept Air Quality Assessment Area



FDP16: Airspace should be designed to maximise capacity in order to contribute economic benefits to Scotland, including tourism. (Economy)

- The optimum number of movements per hour, taking into consideration the fleet mix at Edinburgh Airport.

In Conclusion

- Departure Options
- Arrival Options
- Capacity
- Restrictions on routes
- New Controlled Airspace
- All design principles and how they are approached in Stage 2 (Qualitatively)

Next steps

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Next Steps

NERL ACP

Airspace

- How much systemisation?
- Traffic flows upper airspace
- Sector capacity

Outbound

- SID connections points

Inbound

- Vectoring
- Point merge
- Hold positions

EDI ACP

Capacity

- Investigate on Safe intervals
- Investigate on role of split-point location (SIDs)

Define route options

- Create initial route options (‘mini swathes’) with input from:
  - NERL optioneering
  - Findings capacity study
  - Environmental aspects
  - Airspace and flight procedure design principles

Appraisal (qualitative)

- Apply design principles to options

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Airspace Change Programme

- Any Questions ?
- Feedback to airspace_change@edinburghairport.com
- Friday 17th June

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Annex C
FLOPSC
Airspace Change Programme

- Stage 2: Options development
- Stage 2a: Initial testing with stakeholders of option-outlines
- 14th March 2022

Stage 2A – Options Development

The change sponsor develops one or more options that address the Statement of Need and align with the defined design principles

Identify all possible options

Gathers feedback on the design options from stakeholders

Have the design principles been applied correctly ?

Drivers

Design principles

Departures

Arrivals

Capacity

Feedback

Drivers for the airspace change

1. “PBN”	Modernise airspace	*“to meet technical requirements”*
2. Airspace capacity	Reduce delays, prepare for future growth	*“can meet existing and future demand by increasing the capacity of its runways and allow flights to depart with fewer delays and environmental impacts .”*
3. Environment	May minise environmental impact	*“in terms of the total number of people overflown, as well as when and how often they are overflown – while also cutting average CO2 emissions.”*

(Source: Statement of Need)

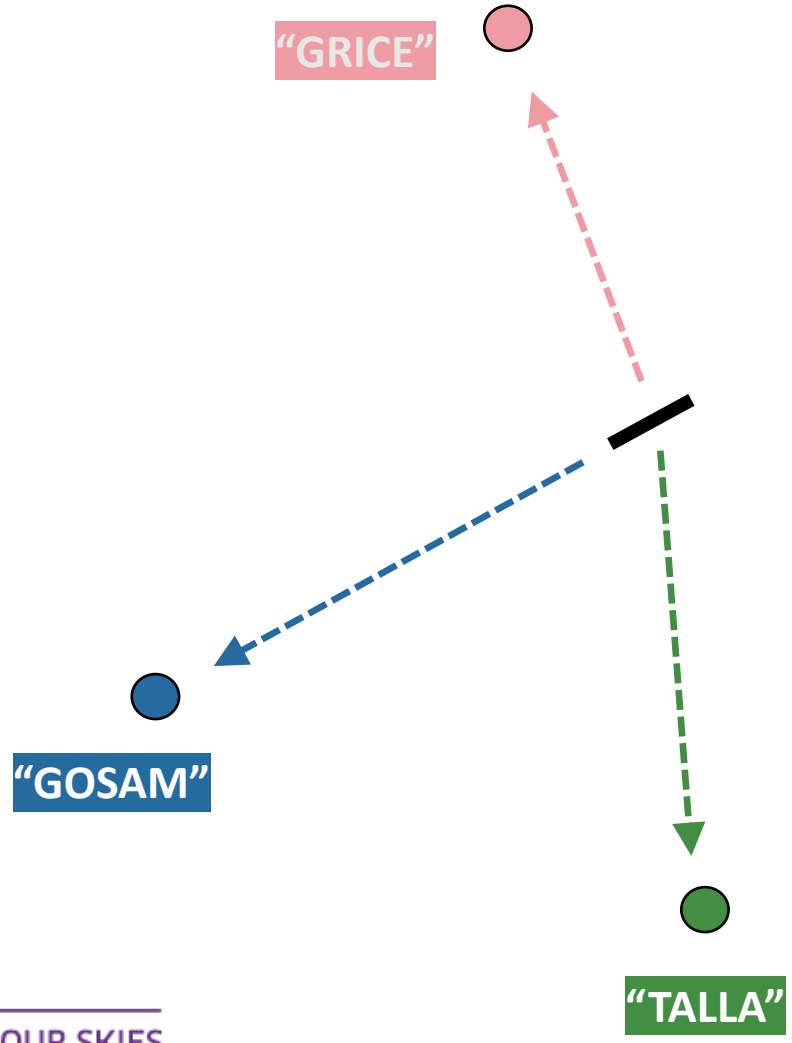
Design Principles

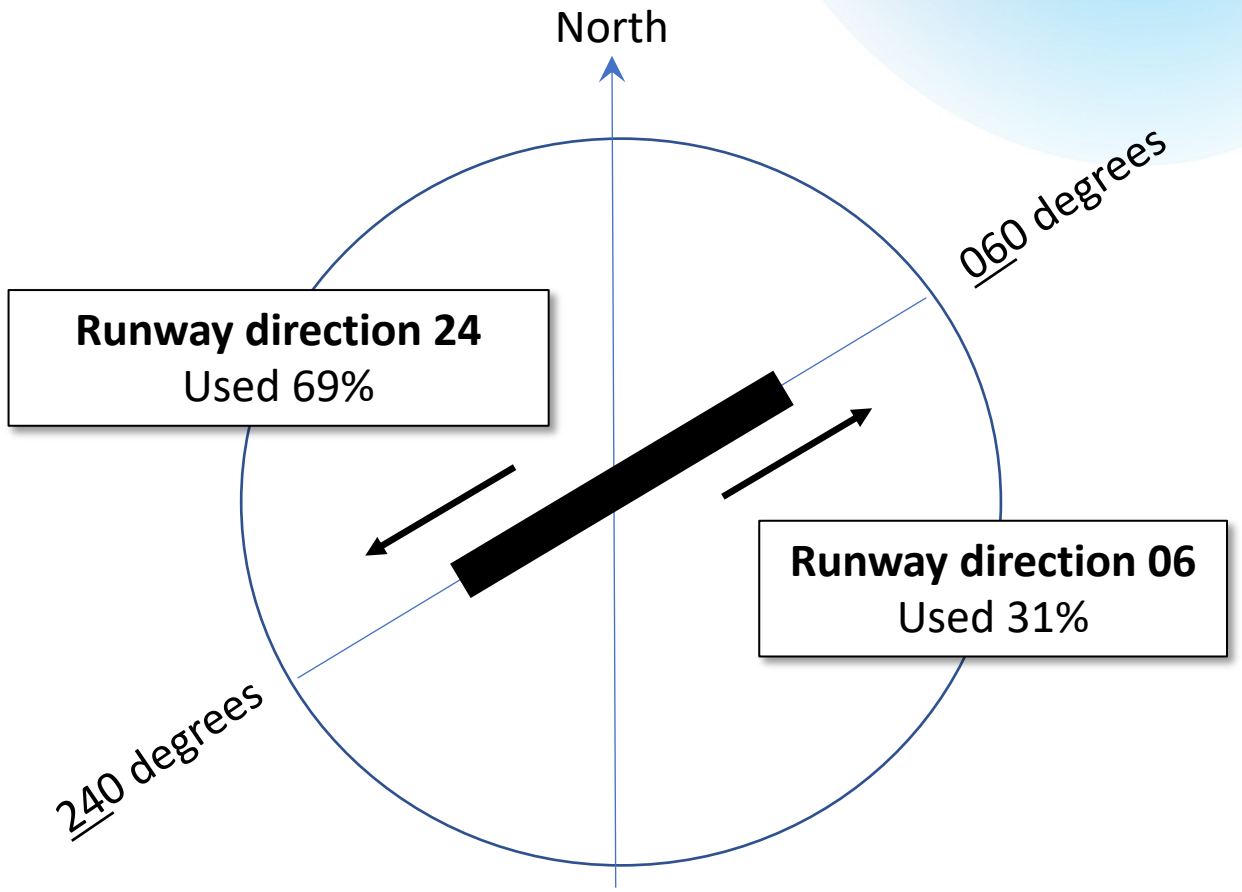
Category	Number	Design principle
Safety (core)	FDP1	The airspace design and its operation must be as safe or safer than it is today.
Safety (core)	FDP2	Flight paths must be flyable and technically supported by air traffic control and airport technical management systems.
Operational (core)	FDP3	Flight paths must be designed to allow modern aircraft to use performance-based navigation (PBN) in line with CAA's modernisation strategy
Operational (core)	FDP4	Routes to/from Glasgow and Edinburgh airports must be procedurally deconflicted from the ground to a preferred level in coordination with NATS Prestwick.
Operational (core)	FDP5	The predictability of flight tracks must be maximised for consistency of operations.
Operational (core)	FDP6	Collaborate with other Scottish airports and NATS to ensure that the airspace design options are compatible with the wider programme of lower altitude and network airspace changes and accords with the CAA's published Airspace Modernisation Strategy (CAP 1711) and any current or future plans associated with it.

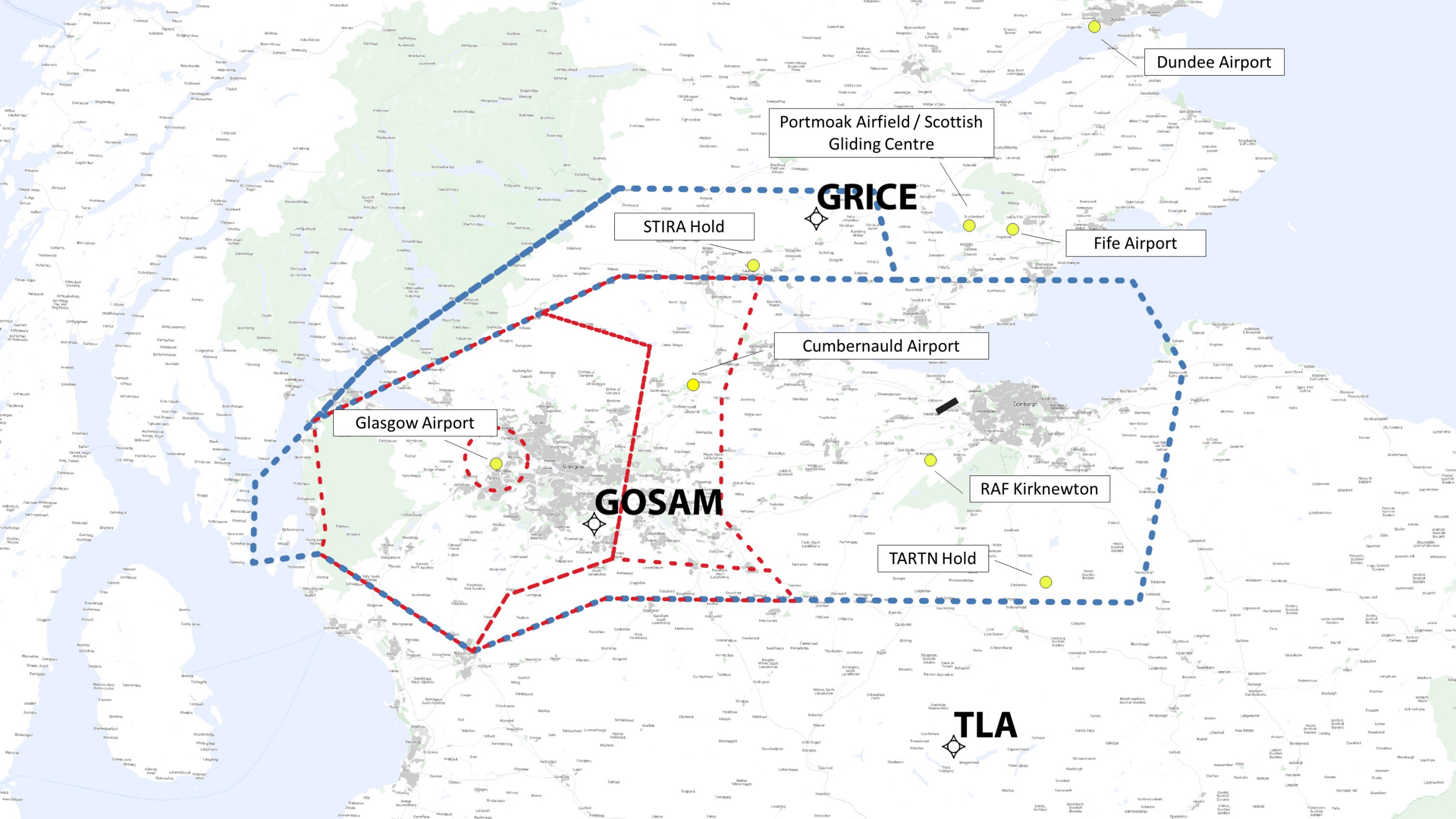
Design Principles

Health and wellbeing	FDP7	Flight paths should be designed to minimise the total adverse effect on health and quality of life created by aircraft noise and emissions.
Health and wellbeing	FDP8	For flightpaths at or above 4,000ft to below 7,000ft, the environmental priority should continue to be minimising the impact of aviation noise in a manner consistent with the government's overall policy on aviation noise, unless this would disproportionately increase CO_2 emissions.
Health and wellbeing	FDP9	Flight paths should be designed to minimise population overflown below 4,000ft and, between 4,000ft and 7,000ft, taking into account any potential adverse impact, due to those overflown having protected characteristics, as defined by the Equalities Act 2010.
Health and wellbeing	FDP10	Flight paths should be designed to minimise overflying sensitive locations and noise-sensitive receptors (for example, the zoo, retirement complexes, green spaces, historic heritage sites, and others).
Health and wellbeing	FDP11	Flight paths should be designed to include track concentration and/or track dispersal options to provide noise respite.
Operational	FDP12	Flight paths should be designed with routes that minimise track miles and fuel burn.
Operational	FDP13	Flight paths should be designed to ensure efficient and effective route management.
Technical	FDP14	Requirements of airspace users should be taken into account when designing flight paths.
Environment	FDP15	Flight paths should be designed to minimise adverse local air quality impacts.
Economy	FDP16	Airspace should be designed to maximise capacity in order to contribute economic benefits to Scotland, including tourism and trade.

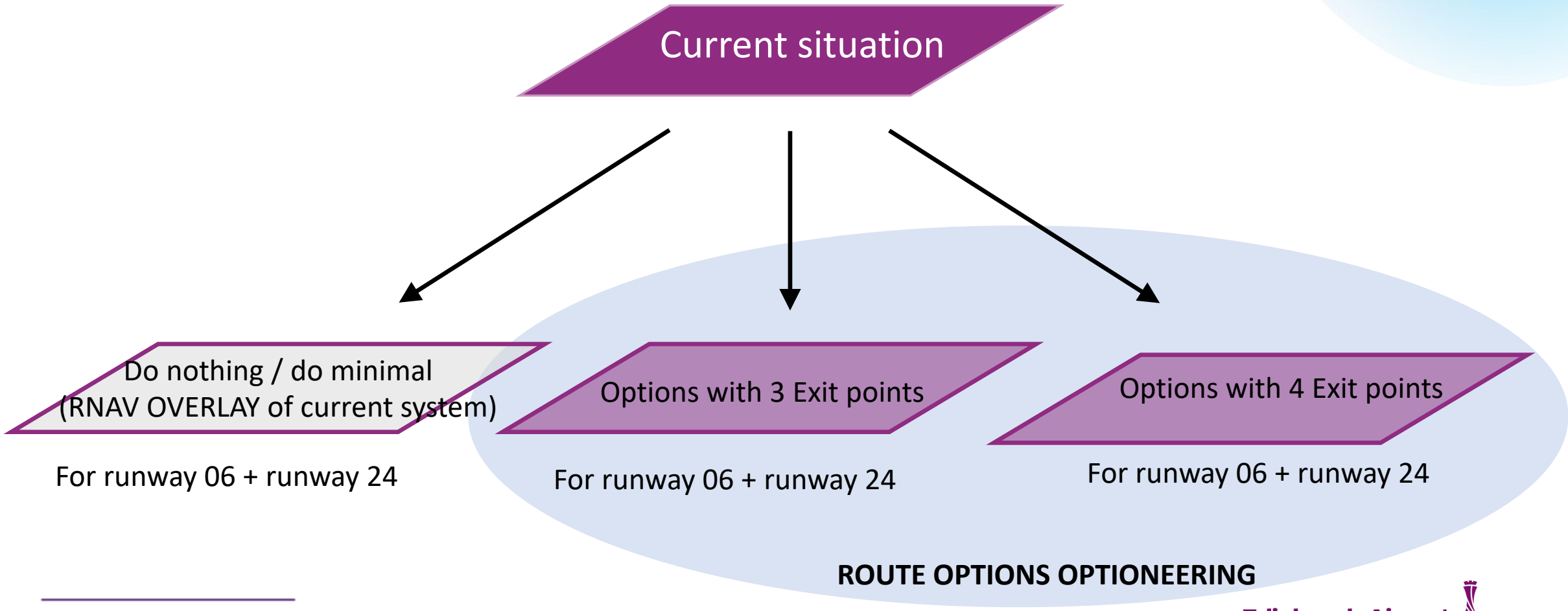
The system / Runway usage





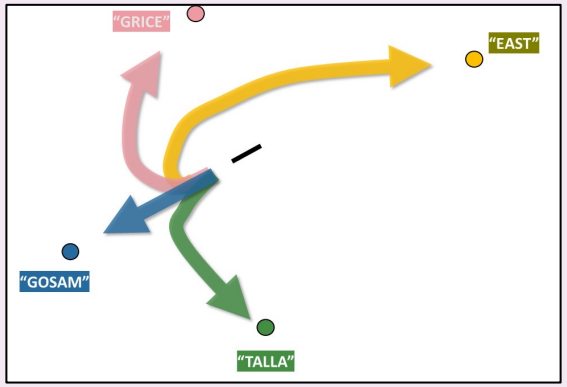

Dundee Airport
Portmoak Airfield / Scottish Gliding Centre
GRICE
STIRA Hold
Fife Airport
Cumbernauld Airport
Glasgow Airport
GOSAM
RAF Kirknewton
TARTN Hold
TLA

Route options under consideration



Departure route direction options with 4 exits points

Runway 24



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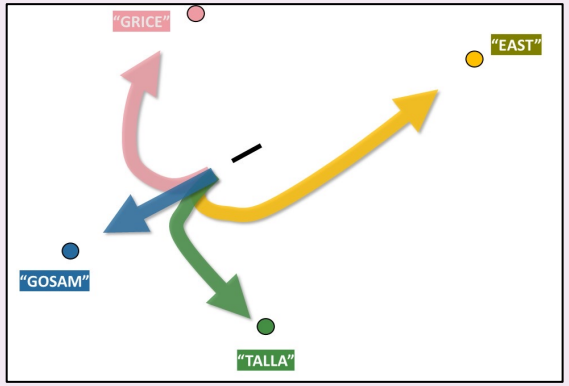
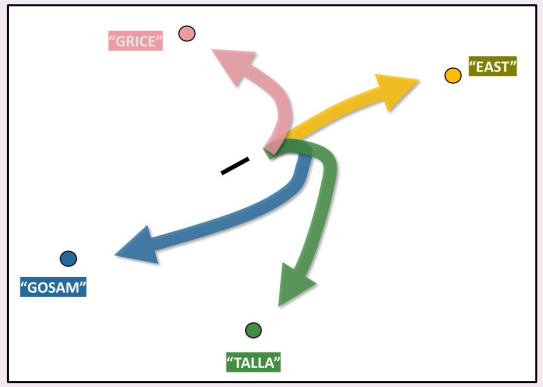


AND

Runway 06



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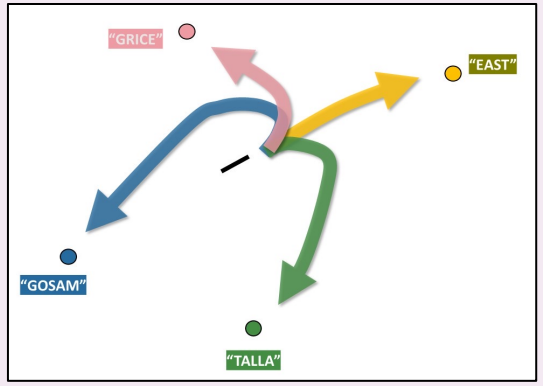

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Swathes

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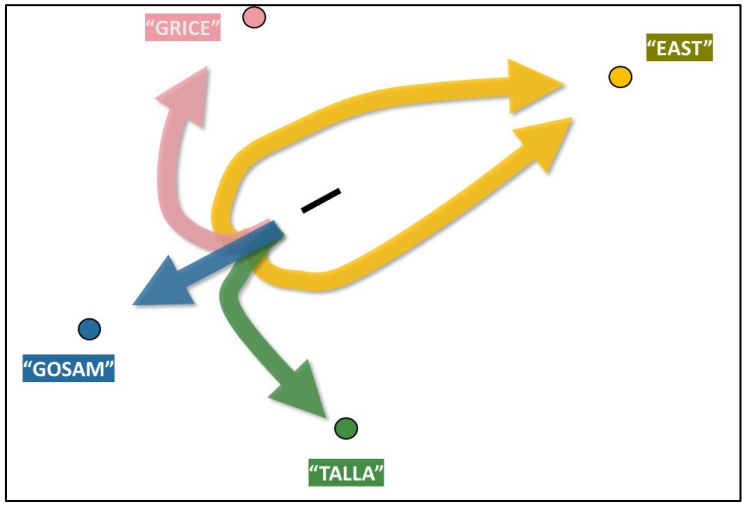
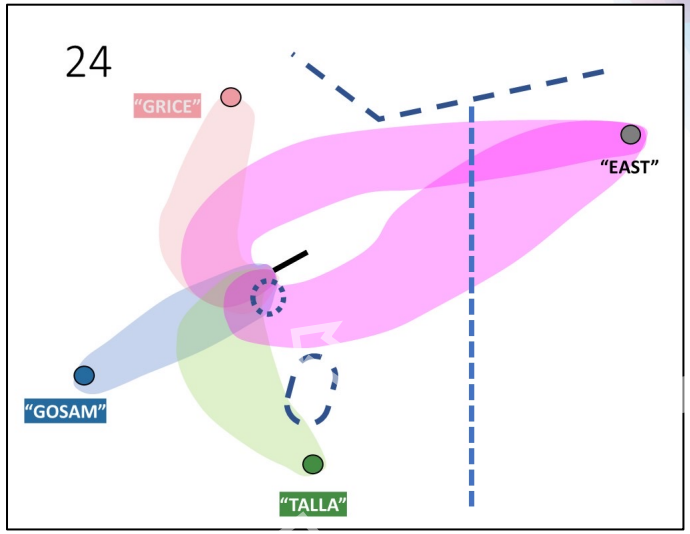
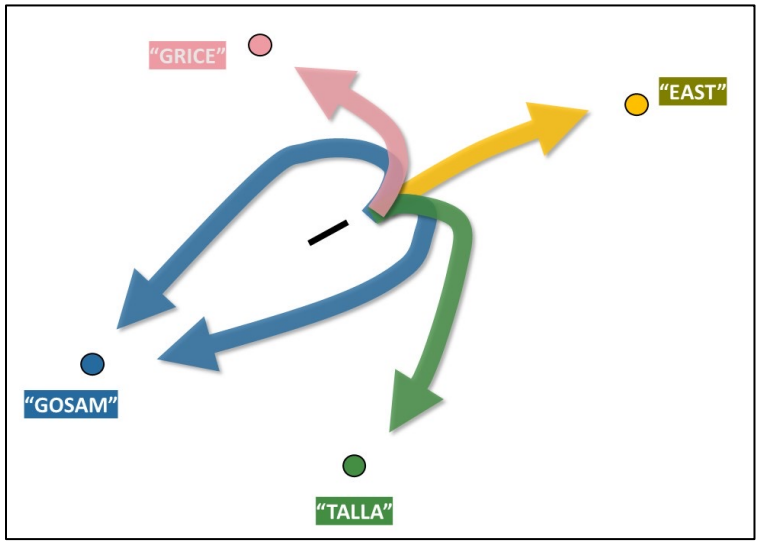
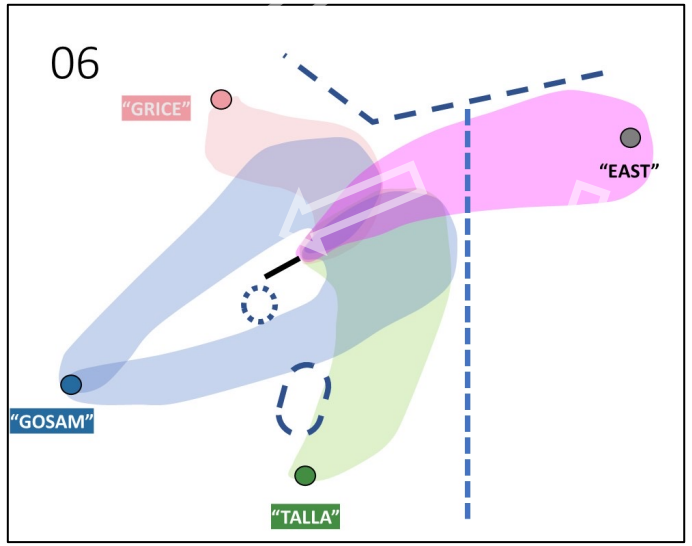
From route directions to swathes

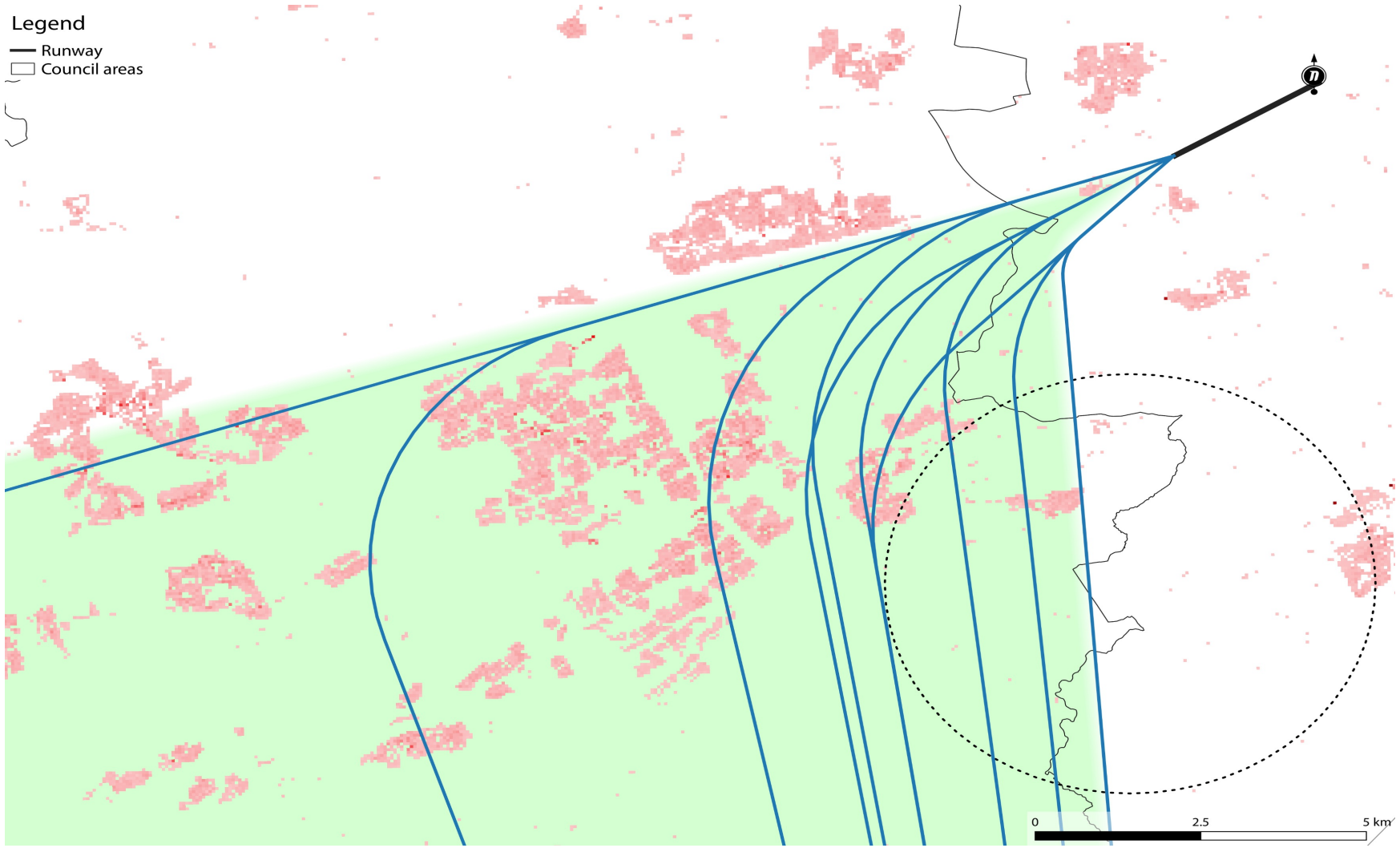








Draft swathe runway 24 to TALLA



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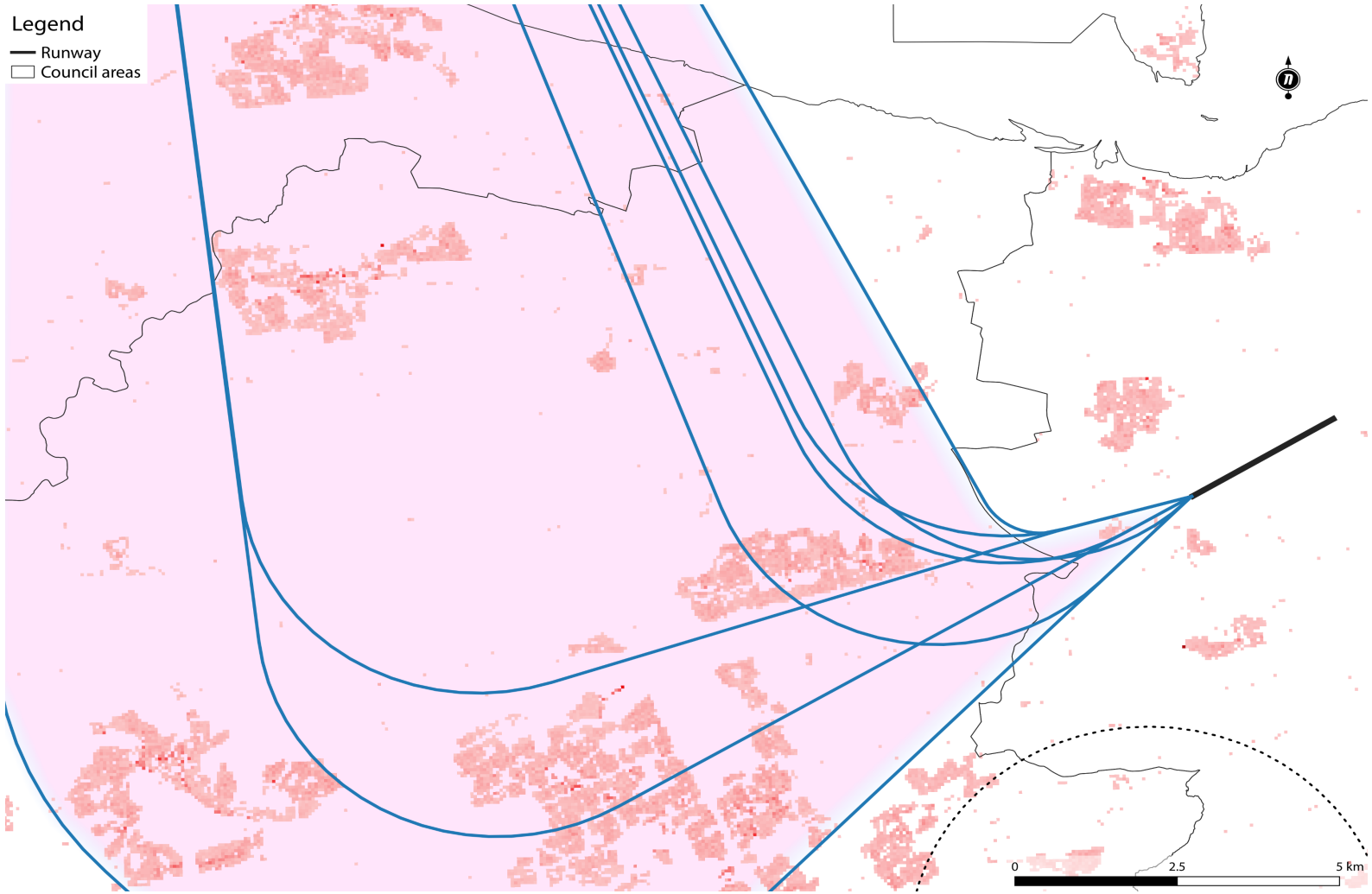
Draft swathe runway 24 to GRICE



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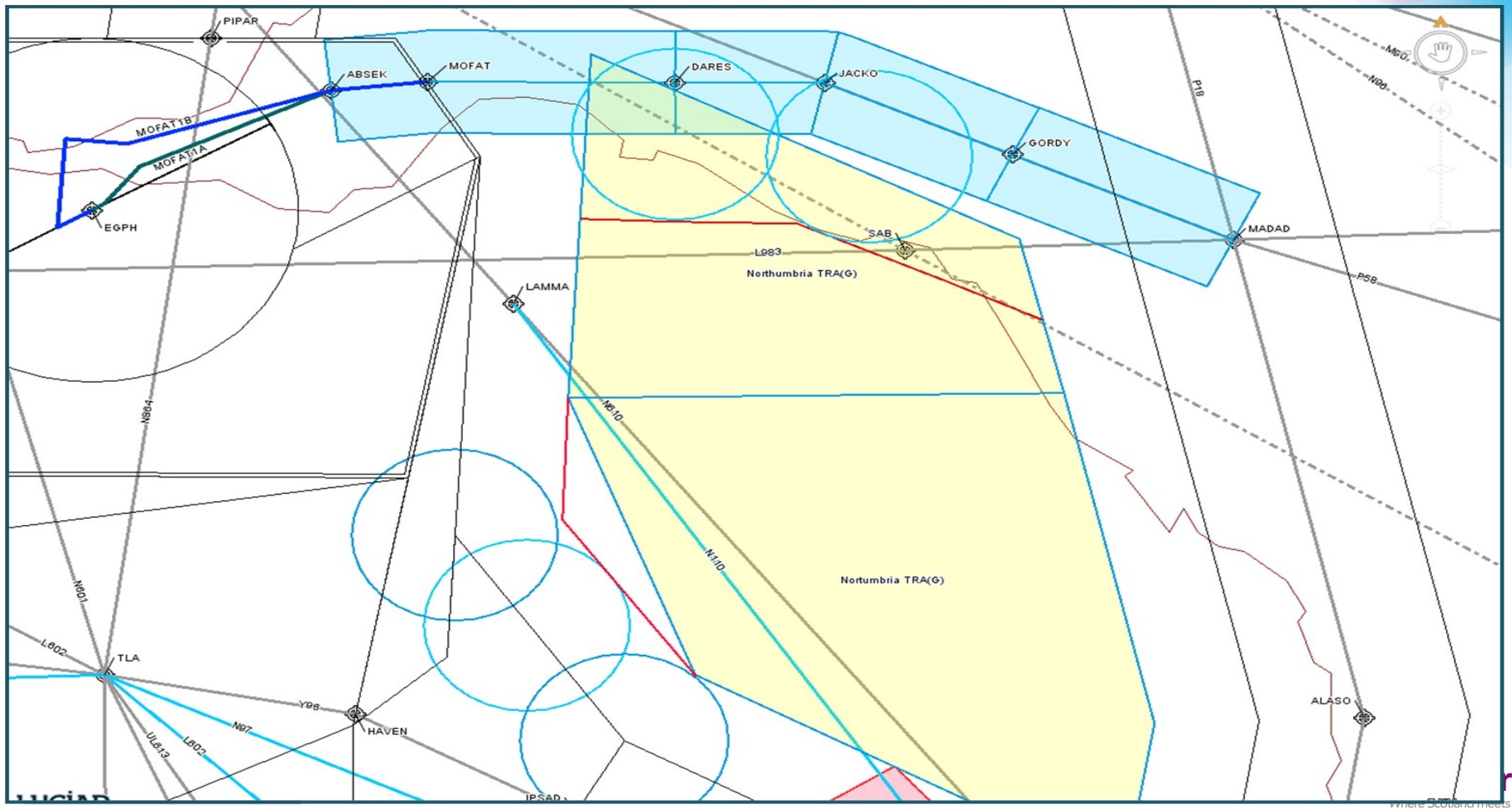
Forth Option



Arrivals & approaches

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Stage 2A – Options Development

Arrivals – 4 options NDB replaced with RNAV approaches

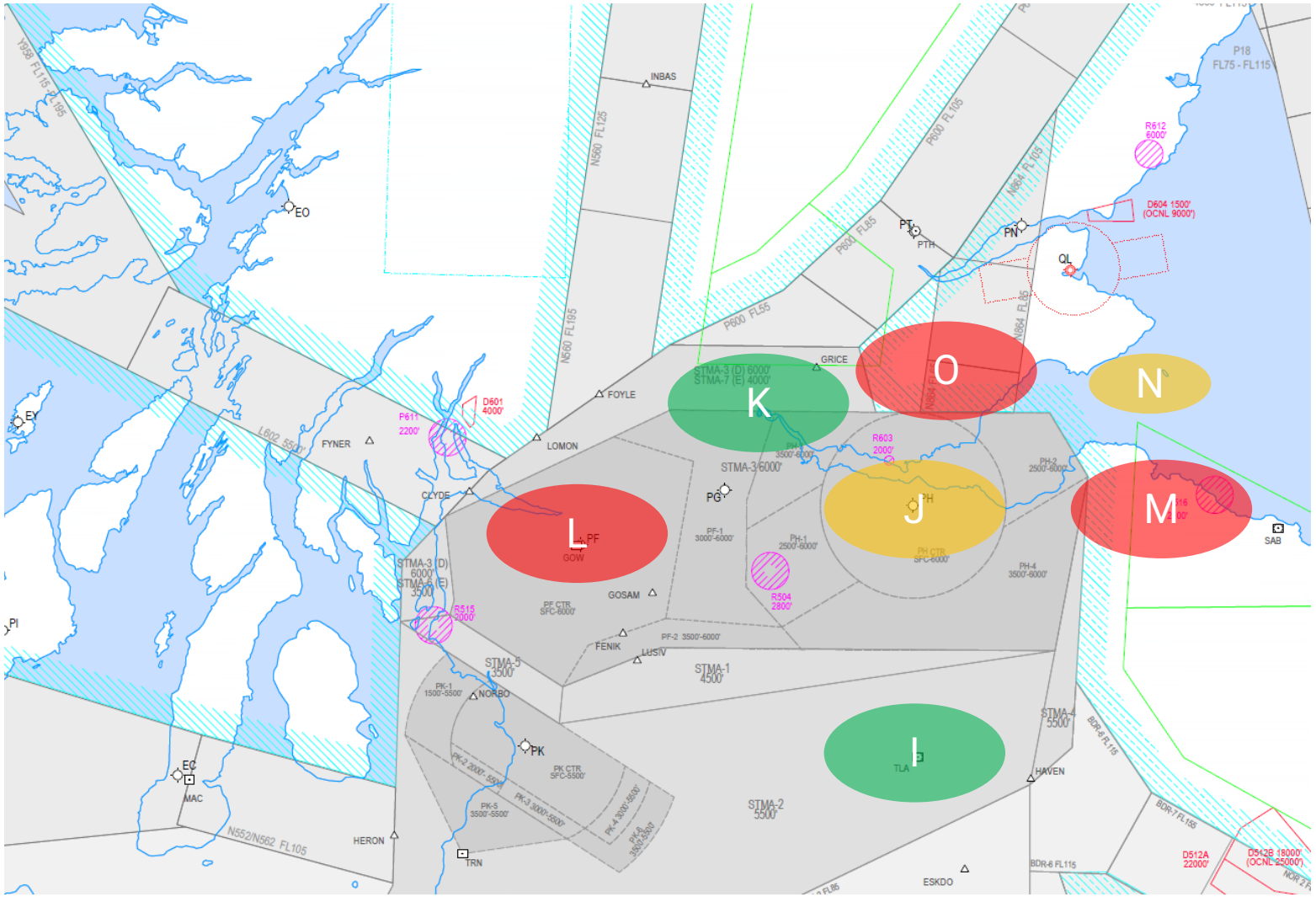
Vector from hold to final

Vector / systemisation from 4000 feet to final (T-bar)

Approach transition from hold to final (fully systemised)

Point Merge – fully systemised (possibly just south of the overhead)

Arrival Structure Locations and number – EGPH



Description I:
- Most traffic from the south
- Similar to today
- Similar to today
- May allow departures to the SE if moved to the west a little

Description J:
- For EGPH traffic only
- More track miles for southerly arrivals
- Equidistant for both runways
- Above the SIDs but may cause clutter
- Having said it is above SIDs an idea is to implement at low level to take the place of the NDB holds

Description K
- Similar to STIRA
- For EGPH traffic only
- Facilitates traffic from the SW and N well

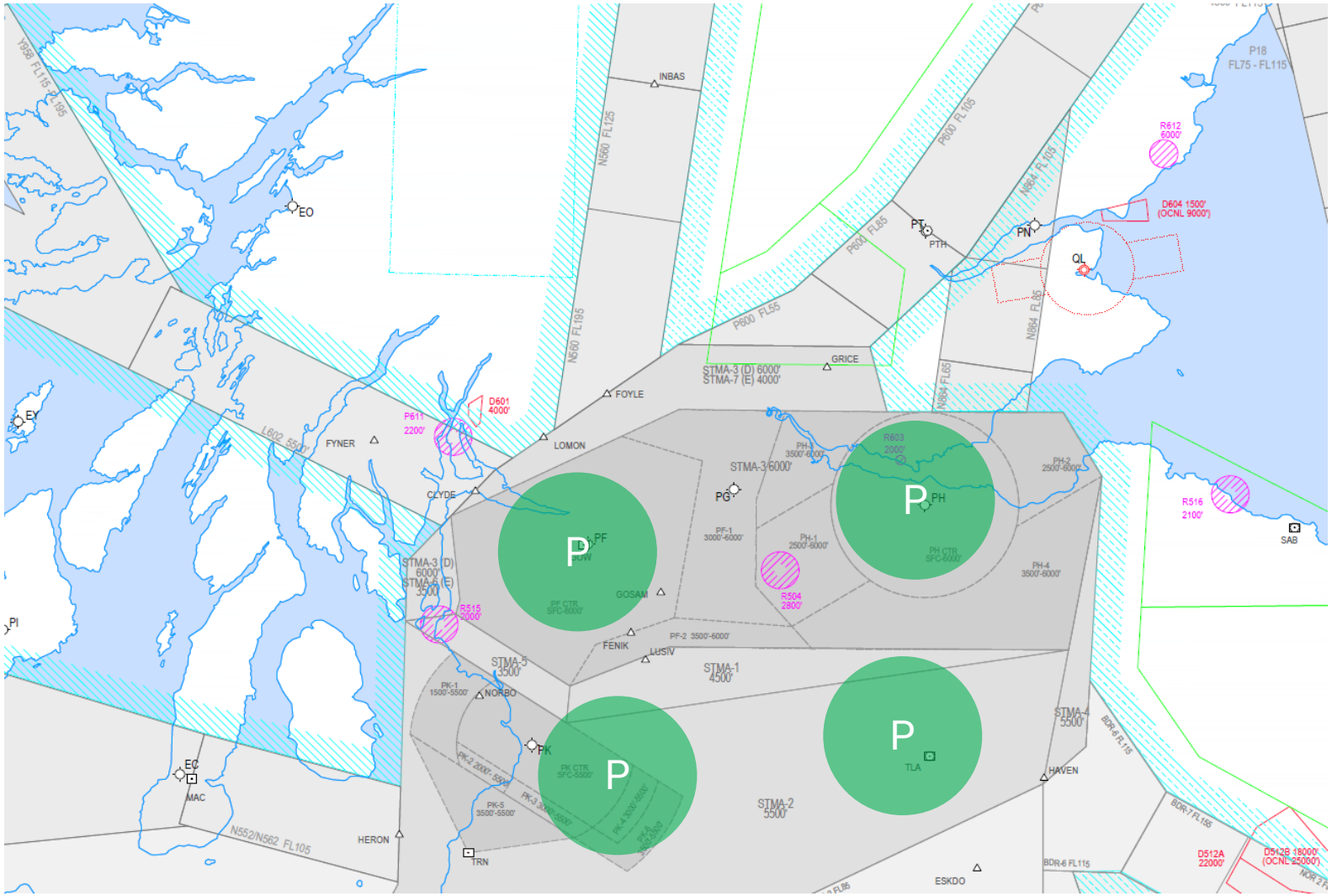
Description L
- No because of Glasgow's traffic
- Also further away from the airfield meaning an increase in track miles
- Against our design principles

Description M
- Outside CAS
- Gliding area
- Away from current traffic flows

Description N
- Only a possibility if we get the Forth option

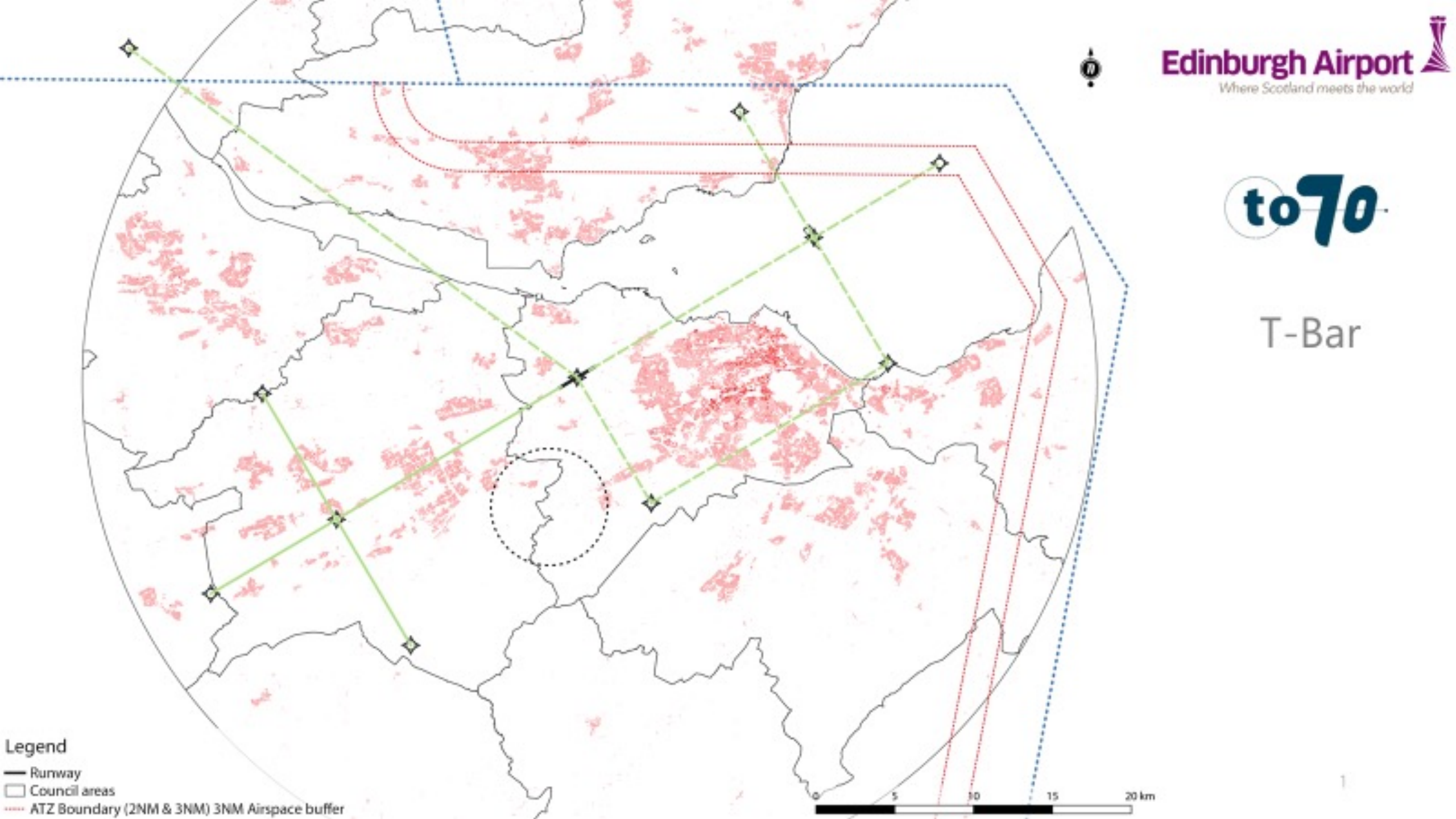
Description O
- Outside CAS
- Track miles
- Portmoak and Fife

Lateral Holding - Point Merge/Trombone



- Simplification of controller tasks, reduction of communications and workload
- Better pilot situational awareness
- More orderly flows of traffic with abetter view of arrival sequences
- Improved containment of flown trajectories after merge point
- Better trajectory prediction allowing for improved flight efficiency
- Standardisation of operations and better airspace management

- Does this increase our capacity?
- Implementation and training issues – culture shift
- Where is the point?


Edinburgh Airport
Where Scotland meets the world
to70
T-Bar
Legend
Runway
Council areas
ATZ Boundary (2NM & 3NM) 3NM Airspace buffer
0
5
10
15
20 km

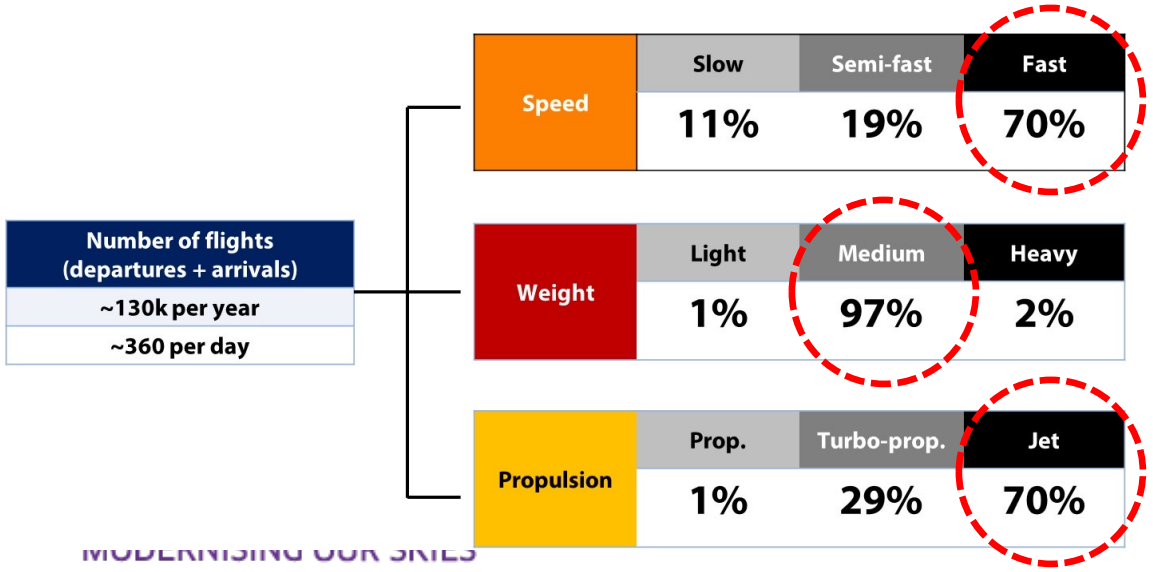
EDI ACP: Current departure capacity

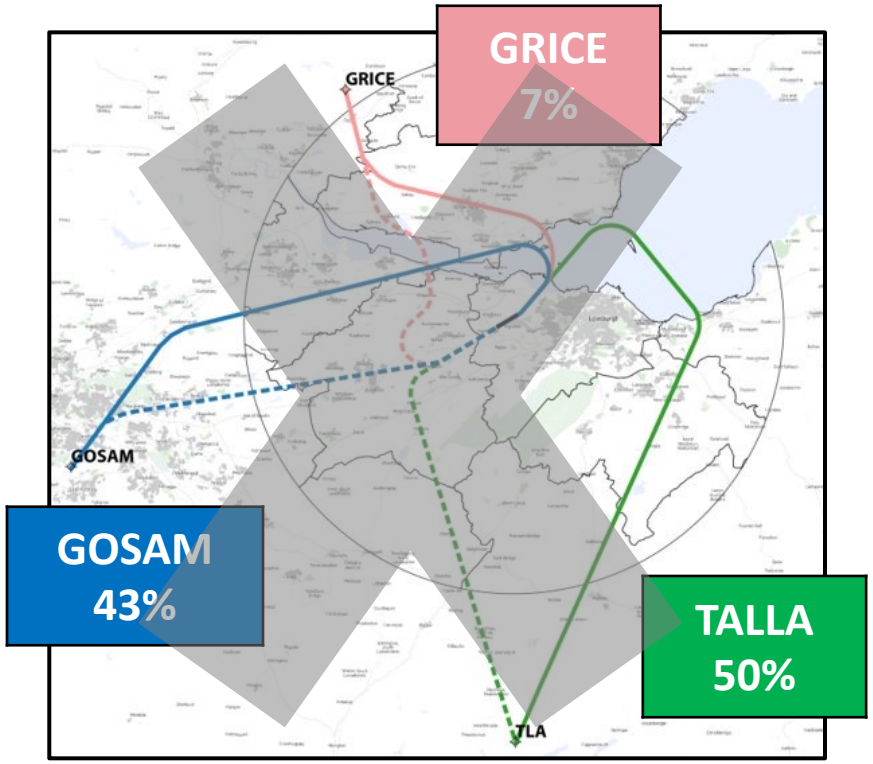
Dictated by:

- **Interval table**
- **Fleetmix**

		Leading aircraft		
		Slow	Semi-fast.	Fast
Following aircraft	Slow	**2 min.**	2 min.	1 min.
	Semi.-fast	3 min.	**2 min.**	2 min.
	Fast	4 min.	3 min.	**2 min.**

….and not the route structure, as all routes are considered as a ‘single route’





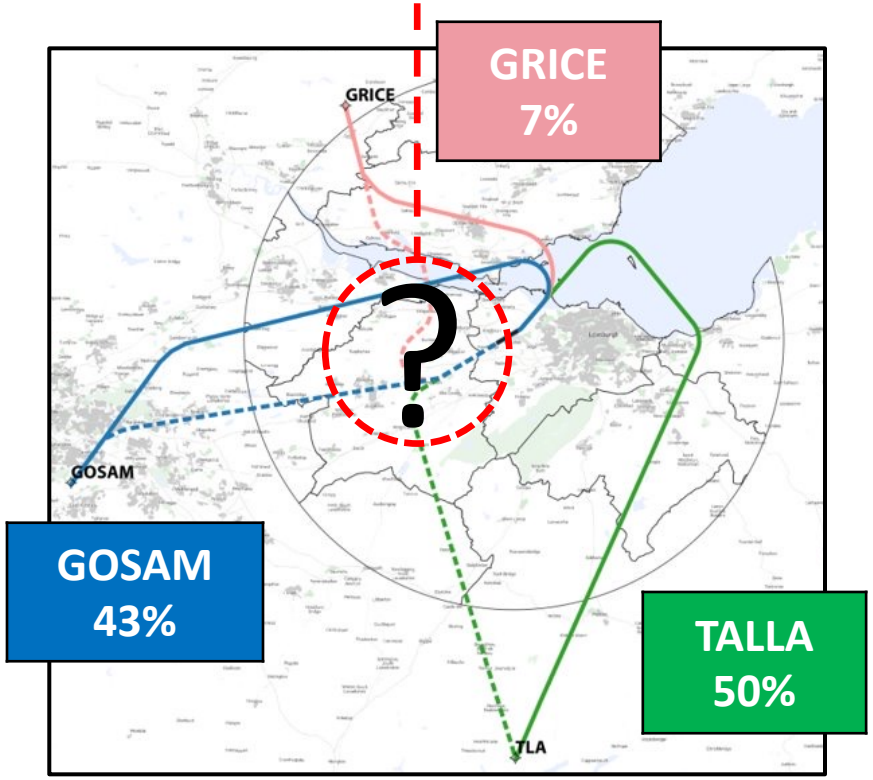
EDI ACP: Optioneering & departure capacity

1. What is the minimum safe interval between successive aircraft ?
2. How can the route design, and in specific the location of the split points of routes, contribute to the departure capacity ?

		Leading aircraft		
		Slow	Semi-fast.	Fast
Following aircraft	Slow	**2 min.**	2 min.	1 min.
	Semi.-fast	3 min.	**2 min.**	2 min.
	Fast	4 min.	3 min.	**2 min.**

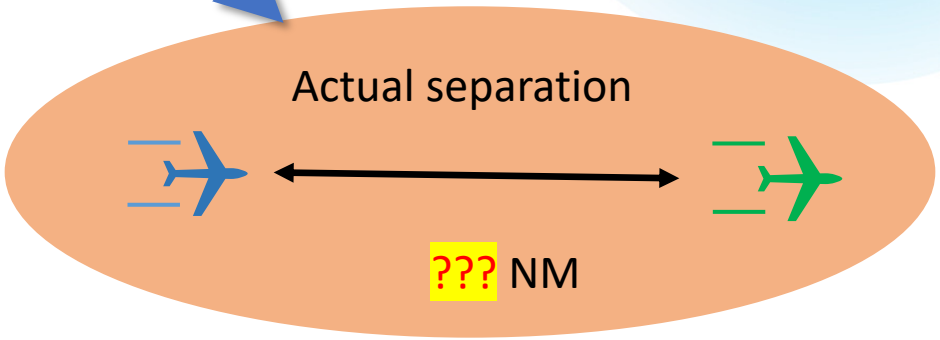
Number of flights (departures + arrivals)
~130k per year
~360 per day

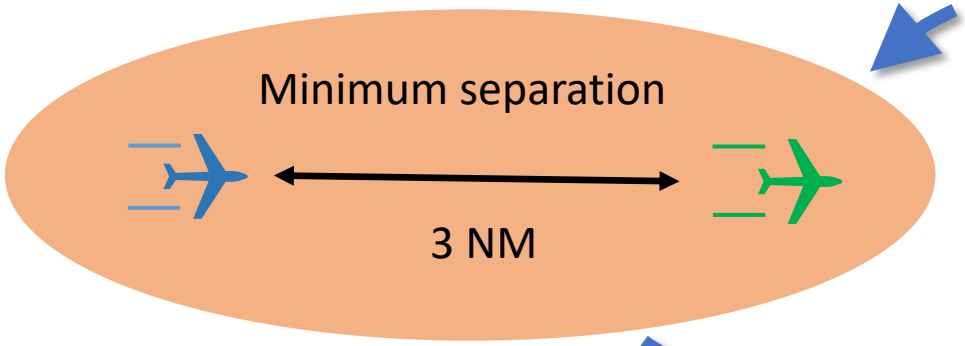
Speed	Slow	Semi-fast	Fast
	11%	19%	70%
Weight	Light	Medium	Heavy
	1%	97%	2%
Propulsion	Prop.	Turbo-prop.	Jet
	1%	29%	70%



EDI ACP: Optioneering & depature capacity

Following aircraft	Leading aircraft: Slow	Leading aircraft: Semi-fast.	Leading aircraft: Fast
Slow	**2 min.**	2 min.	1 min.
Semi.-fast	3 min.	**2 min.**	2 min.
Fast	4 min.	3 min.	**2 min.**





Following aircraft	Leading aircraft: Slow	Leading aircraft: Semi-fast.	Leading aircraft: Fast
Slow	??? **min.**	??? min.	??? min.
Semi.-fast	??? min.	??? **min.**	??? min.
Fast	??? min.	??? min.	??? **min.**

Feedback

- Survey in the Virtual Engagement Platform – access via log in
  - SIDs ?
  - Approaches?
  - Systemisation?

  Combined with these questions

  NADP1 and NADP1 or NPR
  RNAV overlay for GOSAM SID

  Questions?

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Annex D
ACP Airspace Users Engagement

- Thursday 9th September 2021

Airspace Users

- Design Principle
- CAA Airspace Classification review
- Future engagement

Design Principle (EDI)

- Requirements of airspace users should be taken into account when designing flight paths.
- Collaborate with other Scottish airports and NATS to ensure that the airspace design options are compatible with the wider programme of lower altitude and network airspace changes and accords with the CAA's published Airspace Modernisation Strategy (CAP 1711) and any current or future plans associated with it.

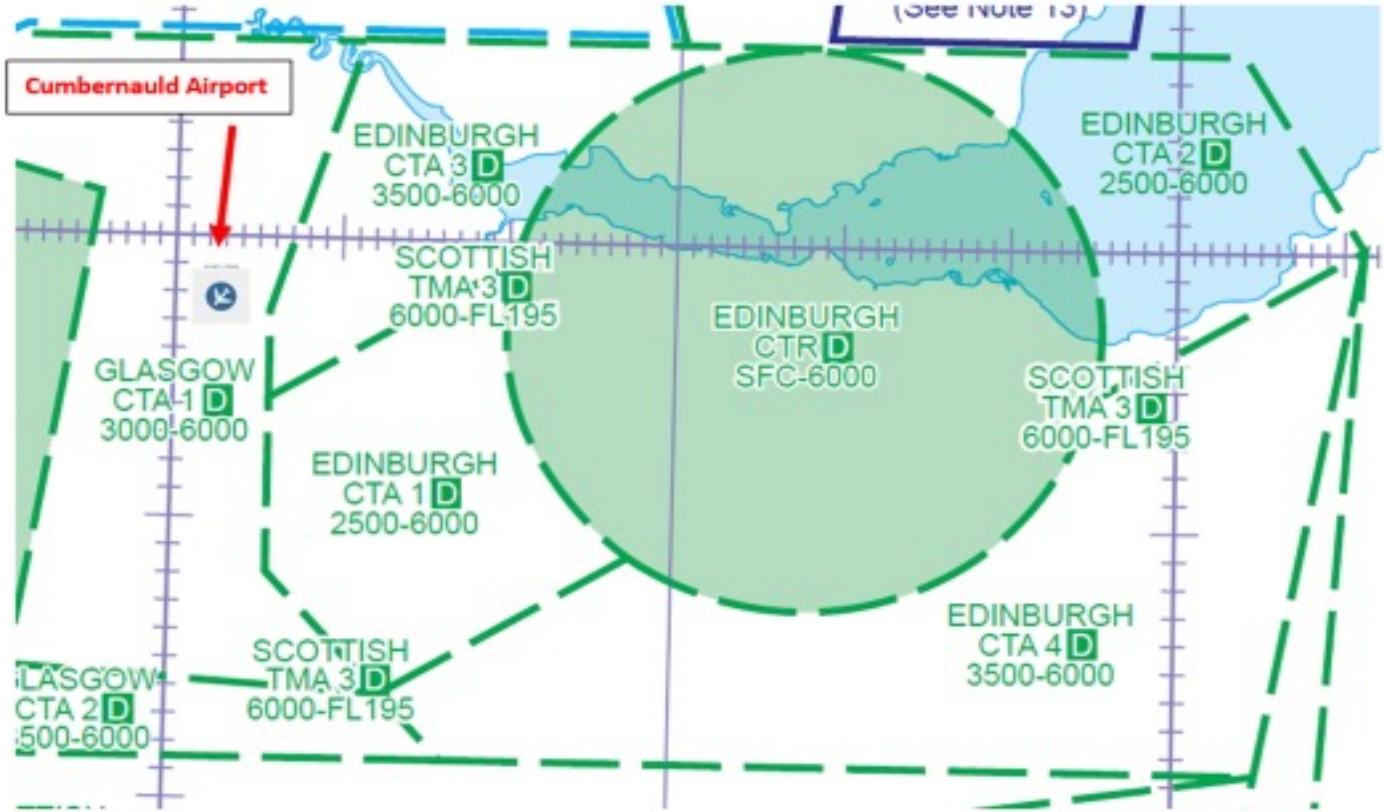
Consultation responses received for Edinburgh Airport

- We have provided a visual of the airspace and a brief summary of the key issues which were raised in the CAA's initial consultation on airspace volumes.
  - The first slide contains responses which are directly talking about Edinburgh Controlled Airspace.
  - The second slide contains the most relevant responses which mention airspace around and/or near the Edinburgh CTAs.

- The raw data from the consultation relating to Edinburgh Airport has been put into an Excel Document and is included with this presentation. We have filtered out any responses which provided generic comments or were not relevant to the consultation.

- Please do not hesitate to contact us if you have any comments or questions about this process and our expectations of you here: airspace.classification@caa.co.uk

Responses related to Edinburgh Airspace



Summary – The responses on Edinburgh controlled airspace highlight the following:

- Existing controlled airspace currently structured around a closed Runway (RWY 12/30).
- Edinburgh airspace is excessive when compared with other UK airports.
- Areas to the North and South of Edinburgh reportedly underused.

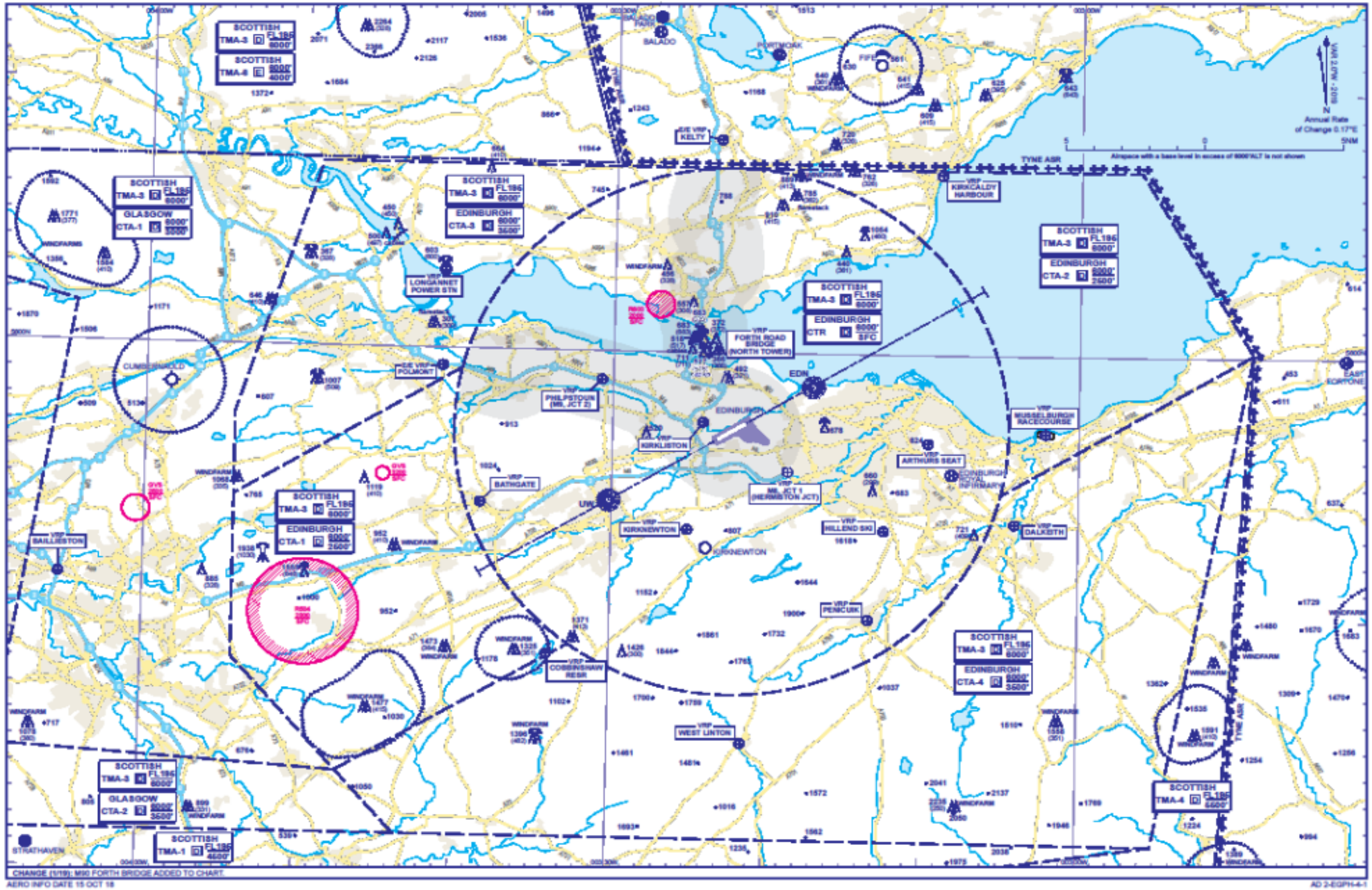
The responses on Edinburgh controlled airspace have requested that the Edinburgh CTA base levels to be raised, particularly Edinburgh CTAs 2, 3 & 4. The focus being on removing airspace associated with Runway 12/30.

Responses related to airspace around / near Edinburgh

Summary – The responses on airspace between Edinburgh and Glasgow highlight the following:

- Below Glasgow CTA 1 is the only North/South corridor for GA traffic to transit through without having to fly over the sea.
- Gap between Edinburgh and Glasgow is narrow and has a low base level.
- Access to Cumbernauld airport made difficult due to the proximity to Edinburgh airspace and low base level.
- Transiting North/South between Edinburgh and Glasgow made difficult for gliders and other GA aircraft due to areas of high terrain combined with the low base level.

The responses on airspace between Edinburgh & Glasgow have requested Glasgow CTA 1 base level to be raised and the airspace widened in both directions, this is to allow better access for GA traffic transiting north and south above high ground, allow return glider flights form the North and improved access to Cumbernauld airport for all GA aircraft. A couple of responses note that there is an LoA for better access, but its limited in design and should be looked at again.



CHANGE (1/19): M90 FORTH BRIDGE ADDED TO CHART.

Future Engagement

- This will take place in November and be focussed on your views on how we have applied the design principles to our flight path options

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